

Knut (German pronunciation: [knuˈt] (listen); 5 December 2006 – 19 March 2011) was a polar bear who was born in captivity at the Berlin Zoological Garden. Rejected by his mother at birth, he was raised by zookeepers. He was the first polar bear cub to survive past infancy at the Berlin Zoo in more than 30 years. At one time the subject of international controversy, he became a tourist attraction and commercial success.[1] After the German tabloid newspaper Bild ran a quote from an animal rights activist that decried keeping the cub in captivity, fans worldwide rallied in support of his being hand-raised by humans. Children protested outside the zoo, and e-mails and letters expressing sympathy for the cub's life were sent from around the world.

Knut became the center of a mass media phenomenon dubbed "Knutmania" that spanned the globe and spawned toys, media specials, DVDs, and books. Because of this, the cub was largely responsible for a significant increase in revenue, estimated at about five million euros, at the Berlin Zoo in 2007. Attendance figures for the year increased by an estimated 30 percent, making it the most profitable year in its 163-year history.[2]

On 19 March 2011, Knut unexpectedly died at the age of four. His death was caused by drowning after he collapsed into his enclosure's pool while suffering from encephalitis.

[edit] Infancy

Knut was born at the Berlin Zoo to 20-year-old Tosca, a former circus performer from East Germany who was born in Canada, and her 13-year-old mate Lars, who was originally from the Tierpark Hellabrunn in Munich. After an uncomplicated gestation, Knut and his unnamed brother were born on 5 December 2006. Tosca rejected her cubs for unknown reasons, abandoning them on a rock in the polar bear enclosure.[3] Zookeepers rescued the cubs by scooping them out of the enclosure with an extended fishing net,[3] but Knut's brother died of an infection four days later. Knut was the first polar bear to have been born and survive in the Berlin Zoo in over 30 years. Only the size of a guinea pig, he spent the first 44 days of his life in an incubator before zookeeper Thomas Dörflein began raising the cub.[4]

Knut's need for round-the-clock care required that Dörflein not only sleep on a mattress next to Knut's sleeping crate at night, but also play with, bathe, and feed the cub daily. Knut's diet began with a bottle of baby formula mixed with cod liver oil every two hours, before graduating at the age of four months to a milk porridge mixed with cat food and vitamins. Dörflein also accompanied Knut on his twice-daily one-hour shows for the public and therefore appeared in many videos and photographs alongside the cub. As a result, Dörflein became a minor celebrity in Germany[5] and was awarded Berlin's Medal of Merit in honour of his continuous care for the cub.[6] Dörflein died of a heart attack on 22 September 2008. He was 44 years old.[7]

[edit] Controversy and media coverage

In early March 2007, German tabloid Bild-Zeitung carried a quote by animal rights activist Frank Albrecht who said that Knut should have been killed rather than be raised by humans. He declared that the zoo was violating animal protection legislation by keeping him alive.[8] Wolfram Graf-Rudolf, the director of the Aachen Zoo, agreed with Albrecht and stated that the zookeepers "should have had the courage to let the bear die" after it was rejected, arguing that the bear will "die a little" every time it is separated from its caretaker.[9] A group of children protested at the zoo, holding up placards reading "Knut Must Live" and "We Love Knut", and others sent numerous emails and letters asking for the cub's life to be spared. Threatening letters were also sent to Albrecht.[10] The Berlin Zoo rallied in support of the baby polar bear, vowing not to harm him and rejecting the suggestion that it would be kinder to euthanise him.[9]

Albrecht stated his original aim was to draw attention to the law, not to have Knut put down. In December 2006 he had taken legal action against Leipzig Zoo to prevent them from killing a sloth bear cub rejected by its mother. His case was dismissed on the grounds that humans raising the animal would have been

against the law of nature. In response to the criticism against him, Albrecht said that he was merely drawing parallels between the two cubs.[10][11] The publicity from this coverage raised Knut's profile from national to international.[12][13]

[edit] Debut and first year

On 23 March 2007, Knut was presented to the public for the first time.[14] Around 400 journalists visited the Berlin Zoo on what was dubbed "Knut Day" to report on the cub's first public appearance to a worldwide audience.[15] Because Knut became the focus of worldwide media at a very young age, many stories and false alarms regarding the cub's health and well-being were circulated during his first year. For example, on 16 April 2007, Knut was removed from display due to teething pains resulting from the growth of his right upper canine tooth, but initial reports vaguely stated that he was suffering from an unknown illness and subsequently put on antibiotics.[16] Much ado was also made about a death threat that was sent shortly before 15:00 local time on Wednesday 18 April 2007. The zoo had received an anonymous letter by fax which said "Knut ist tot! Donnerstag Mittag." ("Knut is dead! Thursday noon.")[17] In response, the police increased their security measures around the bear. The time frame for the threat passed without incident or harm to Knut.[18][19]

Despite Der Spiegel reporting on 30 April 2007 that Knut was "steadily getting less cute" as he increased in age,[20] Knut continued to bring in record crowds to the zoo that summer. After reaching seven months old and 50Â kg (110Â lb) in July 2007, Knut's scheduled twice daily public appearances were canceled due to the zoo's concern for the safety of his keeper. Zoo spokeswoman Regine Damm also said it was time for the bear to "associate with other bears and not with other people." [21] After living in the same enclosure as Ernst, a Malaysian black bear cub who was born a month before Knut, and its mother,[22] Knut was then moved to his own private living space. While visitor numbers dwindled from extreme highs in March and April, Knut remained a major attraction at the zoo for the rest of 2007. 400,000 guests were recorded in August 2007, which was an all time high.[23]

News of Knut and his life at the zoo was still being reported internationally in late 2007. Knut's restricted diet, necessary to curtail his natural weight gain necessary to survive harsh winters, made headlines outside of Germany.[24] His daily meals were reduced in number from four to three, and treats, such as croissants, which were favored by the young polar bear, were restricted.[25] After hurting his foot while slipping on a wet rock in his enclosure a month later in September, there was an outpouring of concern and support from fans worldwide.[26]

In November 2007 and weighing over 90Â kg (198Â lb), Knut was deemed too dangerous for close handling and his interaction with human handlers was further diminished. The celebration of the cub's first birthday, which was attended by hundreds of children, was broadcast live on German television. The national mint also issued 25,000 special commemorative silver coins to mark his birthday.[27] Knut's role at the Berlin Zoo was to have included his becoming an "attractive stud" for other zoos in order to help preserve his species.[28] When Flocke was born at the Nuremberg Zoo in December 2007 under similar circumstances, Bild dubbed her Mrs. Knut, suggesting that the two German-born polar bears might become mates when they matured.[29]

[edit] 2008â ^2010

A year after his public debut, Knut was reported as weighing more than 130Â kg (286Â lb). A plate of six-inch glass, strong enough to resist a mortar blast, was erected between him and zoo visitors.[30] At the end of March 2008, Markus RÃ¶bke, one of the keepers who helped rear Knut, reported that the bear should leave the zoo as soon as possible in order to help him acclimate to a life alone.[31] RÃ¶bke also said that Knut plainly misses his past father-figure, Thomas DÃ¶rflein, and has become so used to attention that he cries when no one is near his enclosure. "Knut needs an audience," RÃ¶bke stated. "That has to change".[31] In April, animal welfare campaigners criticized the zoo for

allowing Knut to kill and eat ten carp from the moat surrounding his enclosure, saying that it was a breach of German animal protection regulations. The zoo's bear expert, Heiner Kläus, however, said that Knut's behavior was "all part of being a polar bear." [32]

In July 2008, it was announced that the Neumünster Zoo in northern Germany, which owns Knut's father, was suing the Berlin Zoo for the profits from Knut's success. [33] Although the Berlin Zoo conceded Neumünster's ownership of Knut due to a previous agreement, it contended that the other zoo has no right to its proceeds. Neumünster had previously tried to negotiate with Berlin Zoo, but later sought a court ruling in their favor. Peter Dräwa, the zoo director at Neumünster, stated that they "do not want to remove Knut from his environment, but we have a right to our request for money." [34] Shortly before Knut's second birthday, reports began circulating that the bear would have to be relocated to another zoo because he was becoming too large for his enclosure. The zoo later released statements that they wish to keep Knut, and the mayor of Berlin, Klaus Wowereit, also declared he wanted the still-adolescent cub to stay in the capital. [35]

Disputes between the two zoos continued into 2009. On 19 May, the Berlin Zoo offered to buy Knut from Neumünster and therefore negate their financial claim on the two-year-old polar bear. Although Neumünster Zoo set a price of € 700,000, the Berlin Zoo stated that they would not pay "a cent more" than € 350,000 (\$488,145). [36] On 8 July, the Berlin Zoo agreed to pay € 430,000 (\$599,721) to keep Knut in Berlin. [37]

Giovanna, a female polar bear roughly the same age as Knut, was relocated to Berlin from Munich's Hellabrunn Animal Garden in September 2009. She was presented to the public on 23 September, and was due to briefly share Knut's enclosure while her regular home in Munich underwent repairs. [38] Her arrival sparked international interest, as many sources mused that the two bears (although sexually immature) would soon be "dating". [39] However, in March 2010, the German chapter of People for the Ethical Treatment of Animals called for Knut to be castrated in order to avoid inbreeding; he and Giovanna share a grandfather and, according to PETA spokesman Frank Albrecht, the same animal rights activist who spoke out about Knut's handraising three years earlier, their offspring would threaten the genetic diversity of the German polar bear population. [40] The Berlin Zoo declined to comment on the matter, only noting that Giovanna's stay in Berlin was still temporary. [41] In August 2010, Giovanna was moved back to Munich after repairs on her enclosure were completed. [42]

Until his death, Knut shared an enclosure with three female polar bears: Nancy, Katjuscha and his mother Tosca. The older bears were reportedly aggressive towards the young male bear, causing news reports in late 2010 to question whether Knut was being bullied. [43] One of the zookeepers disagreed, stating publicly that "For the time being, Knut is not yet an adult male and doesn't yet know how to get respect like his father did. But day by day, he is imposing himself and with time, this type of problem will go away." [44]

On 19 March 2011, at the age of four, Knut collapsed and died in his enclosure. [45] Witnesses reported that after the bear's rear left leg began shaking, he became agitated before convulsing several times and falling backwards into the pool. [46] Approximately 600 to 700 zoo visitors witnessed Knut's death. [47] A statement made on 22 March in relation to the necropsy reported there were "significant changes in the brain, which may be regarded as a reason for the sudden death". [48] Animal welfare organizations in Germany initially accused the Berlin Zoo of negligence, claiming that Knut died of stress caused by being forced to share his enclosure with three female polar bears. [46] The Zoo denied such claims. Bear curator Heiner Kläus stated they "did everything to look after Knut - it's normal for polar bears to live with other polar bears in a zoo, and the idea was that Knut should learn social behavior and other skills from the older females ... He played with the other bears, he was relaxed and strong". [49]

On 1 April, pathology experts announced that Knut's immediate cause of death

was from drowning. The bear's apparent seizure was due to his suffering from encephalitis, a swelling of the brain likely triggered by an infection.[50] It is unknown what infection caused the swelling, but pathologists believe it was a virus. Although Knut showed no symptoms of being ill, pathologists believe that "this suspected infection must already have been there for a long time ... at least several weeks, possibly months".[50] It was also announced that had Knut not drowned after collapsing, he would not have survived the encephalitis.

Knut's sudden death caused an international outpouring of grief. Hundreds of fans visited the zoo after the bear's death, leaving flowers and mementos near the enclosure.[51] The mayor of Berlin, Klaus Wowereit, stated "We all held him so dearly. He was the star of the Berlin zoos".[52][53] The Zoo plans to erect a monument in Knut's honor, financed by donations from fans. Thomas Ziolkowski, the chairman of the Friends of the Berlin Zoo, was quoted as saying "Knut will live on in the hearts of many visitors, but it's important to create a memorial for coming generations to preserve the memory of this unique animal personality." [46] Knut's remains may also be stuffed and put on display in Berlin's Museum of Natural History, although this decision has caused some controversy with fans.[54][55] On 17 January 2012, the Berlin Zoo announced that Knut would be immortalized in a bronze sculpture by Ukrainian artist Josef Tabachnyk. "Knut â ^ The Dreamer", which shows the bear "stretching out dreamily on a rock", was the winner among 40 other entries in a competition held by the zoo.[56]

[edit] Effects of popularity

[edit] Commercial success

The Berlin Zoo registered "Knut" as a trademark in late March 2007. As a result, its shares more than doubled at the Berlin Stock Exchange; previously worth around â -2,000, the value closed at â -4,820 just a week later.[57] The zoo reported that its attendance figures for 2007 increased by an estimated 30 percent, making it the most profitable it had been in its 163 year history.[2] Knut earned the Berlin Zoo nearly â -5 million that year, mainly thanks to an increase in visitors as well as the amount of merchandise sold.[58]

Various companies profited from the attention surrounding Knut by developing themed products such as ringtones and cuddly toys.[59] Plush toy company Steiff produced several Knut-based plush toys in three sizes and models: sitting, standing, and lying down. The first 2,400 produced toys, which sold exclusively at the Berlin Zoo, sold out in only four days.[2] The money raised from the Steiff deal was intended to be used to renovate the polar bear enclosure at the zoo.[60] Candy company Haribo released a raspberry-flavored gummy bear sweet called Cuddly Knut beginning in April 2007. They pledged to donate ten cents to the zoo for every tub of Knut sweets it sold. The gummy bears sold so well that the Bonn-based company had to expand production to a second factory to deal with demand.[61]

Knut was the subject of several popular songs in Germany, the most successful of which were the singles "Knut is Cute" and "Knut, der kleine Eisb r" (English: "Knut, the little polar bear") by nine-year-old Kitty from K penick.[62][63] In Britain, musical comedian Mitch Benn has performed four songs about Knut for BBC Radio 4 satirical series The Now Show: "The Baby Bear Must DIE!",[64] "Knut Isn't Cute Anymore",[65] "Goodbye Knut"[66] and "Panda in Berlin".[67] A blog with updates about the polar bear was maintained by a journalist at the regional public broadcaster Rundfunk Berlin-Brandenburg; it was available in German, English, and Spanish. RBB was also responsible for a weekly television program dedicated to the polar bear cub that was broadcast in Germany. Knut has also been the subject of several DVDs,[68] including one entitled "Knut â ^ Stories from a Polar Bear's Nursery". He appeared on the 29 March 2007 cover of the German Vanity Fair magazine, which included a several page spread about the cub's life.[57]

On 1 May 2007, it was announced that New York-based Turtle Pond Publications and the Berlin Zoo had signed a deal for the worldwide publishing rights to Knut with the hopes of raising awareness of global warming issues. Written by Craig Hatkoff and his daughters Juliana and Isabella, the 44-page book entitled

Knut, der kleine Eisbärenjunge (Little Polar Bear Knut) includes Knut's life story as well as previously unpublished photographs.[69] Although several books about Knut had already been published in Germany, this book was the first to be authorized by the Berlin Zoo.[69]

The book was published in Germany by Ravensburger on 26 July 2007 and US publishing company Scholastic released the English version, entitled *Knut: How one little polar bear captivated the world*, in the United States in November of the same year.[70] Rights to the book have also been sold to publishers in Japan, England, Mexico, China, and Italy.

On 31 December 2007, the zoo's director confirmed the zoo had received a proposal for a film deal from Hollywood film producer Ash R. Shah, whose films include *Supernova* and *Shark Bait*, to make an animated film about the bear's life.[71] Shah reportedly approached the Berlin Zoo with a purported \$3.5 million film deal.[72] Knut made his big screen debut in the German film *Knut und seine Freunde* (Knut and His Friends), which premiered in Berlin on 2 March 2008.[73] Directed by Michael Johnson, the film depicts how Knut was rescued after his mother abandoned him and also features a polar bear family from the Arctic and two brown bear cubs from Belarus.[71]

[edit] Environmental causes

Dr. Gerald Uhlich, of the Berlin zoo's board of trustees, stated that because of his vast popularity, Knut had become a means of communication and that he had the ability to "draw attention to the environment in a nice way. Not in a threatening, scolding way." [74] As a result, the German Environment Minister Sigmar Gabriel officially adopted Knut as the mascot for a conference on endangered species to be held in Bonn in 2008.[74] The minister met with Knut soon after his zoo debut, commenting that although Knut was in safe hands, "worldwide polar bears are in danger and if Knut can help the cause, then that is a good thing." [14]

Photographer Annie Leibovitz took pictures of Knut that were used for an environmental campaign, including *Vanity Fair* magazine's May 2007 Green Issue in which he was superimposed into a photograph with American actor Leonardo DiCaprio.[75] The polar bear has also been depicted on the logo for the German Environment Minister's campaign to help stop global warming[27] and a 2008 special issue stamp. Officially released on 9 April, the stamp shows the roughly one-year-old Knut with the slogan "Natur weltweit bewahren" ("Preserve nature worldwide"). [58]

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Lost: Missing Pieces is a series of thirteen video clips ranging in length from one to four minutes that aired during the hiatus between the 3rd and 4th seasons of the television show *Lost*, from which the series is spun off.[1] They generally became available to Verizon Wireless users on Mondays from November 2007 to January 2008 and were uploaded onto the ABC's website a week later for free streaming.[2] The "mobisodes", which have also been referred to as "webisodes", were shot in Honolulu, Hawaii, and produced by the same crew with the same cast as the television series; thus, all content is considered to be canonical.[3] *Lost: Missing Pieces* were included as special features in the fourth season's 2008 DVD releases.[4]

The project was announced in November 2005 as the *Lost Video Diaries*; however, production was delayed several times due to contractual restrictions. *Lost*'s writer-producers originally proposed the mobisodes as a self-contained story that would focus on two previously unseen characters of the *Lost* fictional universe. These characters would be played by actors who were not part of the Screen Actors Guild; however the entertainment guilds refused to support such a project. After months of unsuccessful negotiating, the series was seemingly shelved by ABC. In June 2007, it was announced that the mobisodes, which would be renamed *Lost: Missing Pieces*, would star the regular characters of *Lost* in thirteen short video clips unrelated to each other.[5] Twelve scenes were newly shot; one was a deleted scene from the television series. Critical response to *Lost: Missing Pieces* was mixed. The series was nominated for an Emmy Award in 2008.

[edit] Production

[edit] Conception

In November 2005, while the early second season of *Lost* was airing, The Hollywood Reporter reported that twenty-two mobisodesâ ~each spanning several minutesâ ~were expected to be produced in December for a January 2006 release.[6] Zap2it reported that they would later be present on the second season's DVD set and that six would be exclusive to the DVD.[7] Unlike the television series, it would not be produced by ABC Studios (known then as "Touchstone Television") and would star non-Screen Actors Guild members; however it would be produced under the oversight of Damon Lindelof and Carlton Cuse, like the television series.[8] In response to fan inquiries about *Lost*'s thirty-odd background characters, the *Lost* Video Diaries would focus on a self-contained story about two survivors of the crash of Oceanic Flight 815 who had not previously been introduced.[9] The Los Angeles Times confirmed in January 2006â ^the month originally scheduled to launch the series[10]â ^that the mobisodes would be originally broadcast on V CAST from Verizon Wireless and that each mobisode would span only two minutes.[11] Verizon would ultimately pay ABC \$400,000 for the mobisodes.[12]

[edit] Postponement

Production was delayed when the actors, directors and writers guilds refused to support the spin-off. A deal previously unheard of was negotiated in April,[13] which allowed guild members involved to collect residuals.[14] This agreement prompted Lindelof and Cuse to develop a storyline for the Video Diaries that would include *Lost*'s regular characters, although not all of *Lost*'s regular cast signed contracts. According to Touchstone's executive vice president for production Barry Jossen, who would eventually serve as an executive producer on the mobisodes, "They seem to be under the impression that we'll make millions of dollars and they won't".[12] Variety reported that the mobisodes would be produced and aired alongside the third season of *Lost*. [15] At Comic-Con International in July, Lindelof and Cuse announced that only thirteen mobisodes would be produced. They would run during the third season's winter hiatus, with none saved exclusively for the third season's DVD set.[16] A sneak peek of the Video Diaries was also shown at Comic-Con. The new premise featured Hurley Reyes (played by Jorge Garcia) finding a functional Dharma Initiative video camcorder[17] that had Dharma orientation films on it.[18] In the clip, he films Kate Austen (Evangeline Lilly) and James "Sawyer" Ford (Josh Holloway).[19] During the hiatus, no mobisodes were to be found and clips from upcoming episodes called *Lost* Moments aired instead, on television and then ABC.com.[20] In January 2007, Wizard discovered that ABC was still negotiating the actors' contracts; thus, no mobisodes had been produced, aside from the Comic-Con teaser.[21] In February, *Lost*'s script coordinator, responding to a fan question, suspected the mobisodes had seemingly been put on hold indefinitely due to an inability to reach a contract agreement.[22]

[edit] Revamp

In June, Lindelof and Cuse were interviewed by The Hollywood Reporter and they revealed the ultimate plan for the mobisodes. The mobisodes would air during the hiatus between the third and fourth seasons and would give viewers interesting information that would probably not be found in the show; the average mobisode would only be one and a half minutes long.[23] In the third season, the writers tried to integrate two previously unseen crash survivors named Nikki Fernandez (Kiele Sanchez) and Paulo (Rodrigo Santoro) into the story, but the pair was negatively received for their abrupt appearance and the writers killed them off after seven appearances.[24] Lindelof and Cuse learned from their mistake and decided that the mobisodes would focus on the regular *Lost* cast.[25] The writers were paid \$800 per mobisode, whereas the actors received \$425 per mobisode. Actors were contracted to receive more money if the mobisode were reused in another medium.[12]

[edit] Release

In regard to writing, co-executive producer Edward Kitsis said that "sometimes it was a scene we always wanted to do, a scene that never got shot, sometimes it was just something interesting".[26] "Buried Secrets" revisits the first

season storylines of sexual tension between Sun-Hwa Kwon (Yunjin Kim) and Michael Dawson (Harold Perrineau) and the mutual detestation between Sun's husband Jin (Daniel Dae Kim) and Michael.[27] These conflicts were going to be further explored in the first season; however, positive fan reaction to Sun and Jin as a couple and good chemistry between the actors playing Michael and Jin led to the abandonment of the love triangle.[28] Reuters announced in November that the mobisodes would premiere that month.[29] This proved to be true, with "The Watch" appearing suddenly to Verizon customers as the first of the Lost: Missing Pieces. A new mobisode would generally become available each Monday and would be released a week later as a free webisode on ABC's website. The Writers Guild of America strike occurred as the mobisodes were released, due to television writers wanting a deal similar to that achieved for Missing Pieces.[30] Filming was completed in late November.[31] The mobisodes were later released as special features on the DVD and Blu-ray sets of Lost: The Complete Fourth Season[^] The Expanded Experience in the second half of 2008.

Although it had not always been the plan,[32] the Missing Pieces were produced by ABC Studios. Executive producer Jack Bender directed each mobisode, with writing duties divided between executive producers Lindelof and Cuse,[33][34] supervising producer Elizabeth Sarnoff,[35] co-producer Brian K. Vaughan,[36] executive story editor Christina M. Kim,[37] and co-executive producers Drew Goddard, Edward Kitsis and Adam Horowitz.[38][39][39] Other crew members included executive producer Bryan Burk of post-production and co-executive producer Jean Higgins of physical production. "The Envelope"[^] a deleted scene from the third season premiere; the only mobisode not to be originally filmed and written for Lost: Missing Pieces[40][^] contained additional credits: Jeff Pinkner is an executive producer and executive producer J. J. Abrams is a co-writer.[41]

[edit] Cast and characters

The Missing Pieces retained many of the cast members from the television series. Perrineau plays Michael,[42] who had not been seen since the second season.[43] Matthew Fox plays Jack Shephard,[44] the leader of the castaways and Elizabeth Mitchell portrays his love interest, Juliet Burke.[42] Garcia reprises his role as crash survivor Hurley.[45] Kim and Kim play married couple Jin and Sun.[37] Michael Emerson acts as Ben Linus, the leader of the island residents known as the "Others".[44] Guest stars John Terry,[46] Daniel Roebuck,[47] William Mapother[48] and Julie Adams[41] reprise their roles of Christian Shephard, Leslie Arzt, Ethan Rom and Amelia, respectively. Emilie de Ravin, who plays Claire Littleton, appears solely in archived footage from the television show.[33] Vincent, a dog who survived the plane crash, is played by the dog Pono.[49] Guest star Sean Whalen makes his first appearance as the crash survivor Neil "Frogurt".[39] While the second season was airing, the writer-producers confirmed in the April 3, 2006 edition of the Official Lost Podcast that Frogurt would appear in the late second season,[50] however, he was merely mentioned once.[51] Frogurt also did not appear in the third season and he became a running gag in the podcast,[52] with Lindelof and Cuse repeatedly claiming that Frogurt would appear in the show.[53][54] However, Frogurt did appear in the fifth season briefly, but was shot through with flaming arrows shortly after being introduced.[55]

[edit] Mobisodes

"Prod. no." is short for "production code number", which signifies the order that the mobisodes were produced in and appear on DVD and Blu-ray, which is different from the order that they aired in. "Original air date" refers to the original V CAST airdate. Days are in relation to the day of the crash, which is day 1 and September 22, 2004. All mobisodes are newly written and shot,[3] with the exception of "The Envelope", which is a deleted scene from "A Tale of Two Cities" that was shot on August 9 and 11, 2006,[56] a year before the other mobisodes.[57]

[edit] Reception

The finale[^] "So It Begins"[^] was submitted to the Academy of Television Arts & Sciences for Emmy consideration in the "Special Class: Short-Format

Live-Action Entertainment Programs" category.[58] Executive producers Damon Lindelof, Carlton Cuse and Barry Jossen were successful in receiving a nomination on July 17, 2007;[59] however, they lost to SciFi's Battlestar Galactica: Razor Flashbacks on September 13 at the Creative Arts Emmy Award ceremony of the 60th Primetime Emmy Awards.[60] Douglas Durdan of the Richmond Times-Dispatch described "The Watch" "as unsatisfying as it is satisfying" because the reviewer was unsure of which lines were important or if there were any clues to future episodes hidden amongst the background.[61] After two mobisodes aired, UGO's Jon Lachonis wrote that "the [first two] mobisodes ... have most fans kvetching about the irrelevancy and down right Lost-lessness of the tidbits that are meant to traverse gaps in the story", "it's way too early to dismiss the mobisodes as a complete waste of time, as Lost has a long history of righting its own wrongs and the best may certainly be yet to come" and "[Frogurt is] the most annoying person on Lost's mystery island".[18] Four mobisodes later, UGO called them "impressive" and said that "they 'look' like full out productions".[62] Larry Dobrow of Advertising Age enjoyed the first six Lost: Missing Pieces, describing them as "all entertaining and professionally rendered" and calling the project "a great friggin' idea".[63] Josh Wigler of Wizard wrote that the Lost: Missing Pieces are "hit or miss in terms of quality and importance. Some episodes, however, shed some excellent light on Lost mythology. ... In terms of flat out fun, it doesn't get much better than 'Jin has a Temper-Tantrum on the Golf Course' ... featuring a frustrated Jin screaming to the high heavens after botching an easy putt against Michael. Unnecessary, yes. Hysterical, absolutely."[64]

MSNBC's Ree Hines reviewed the first seven Missing Pieces.[65] He wrote that "'The Watch' is basically pointless", "the humor [of 'The Adventures of Hurley and Frogurt'] doesn't work" and "Operation: Sleeper" was deemed "the most useless of the webisodes".[65] Hines said that "King of the Castle" "almost satisfies ... due to ... Ben's deadpan dastardly presence" and "Room 23" is the most promising of the first half of the series.[65] Hines concluded that "the creators fill gaps that don't need filling. The installments fail to form a cohesive stand-alone arc, leaving viewers with little more than a series of fragmented scenes, presumably no better than those left on the cutting-room floor."[65]

Chris Carabott of IGN reviewed most of Lost: Missing Pieces and has given each a rating out of ten.[66] After four mobisodes aired, he remarked that "these vignettes feel like your average deleted sceneâ ~removed for a good reason";[67] however, no mobisode received a score less than 6.5. "The Watch" scored a 7.5 and was called "touching" because Jack and his father have rarely been seen getting along in Lost.[68] "The Adventures of Hurley and Frogurt" was given a 6.5 and described as "a funny little moment" and "tragic", in regard to Libby's death.[69] "King of the Castle" received an 8.5. Carabott said that it was well-written, "a great performance from [Fox and Emerson]" and worthy of appearing on television.[70] Carabott celebrated Michael's return in "The Deal", but the reviewer noted that "The Deal" "doesn't reveal anything new or exciting at all".[67] "Operation: Sleeper" was rated as a 7.5,[71] as was "Buried Secrets".[72] "Room 23" got an 8 and was described as "definitely the type of new content that we are looking for. It's something that won't be missed by regular viewers but gives a little more insight into the nature of events on the island".[73] "Arzt and Crafts" also got an 8 and was said to have "a cleverly devised title" and was "packed with a healthy amount of humor".[74] "Tropical Depression" received an 8.5, with Carabott calling it "rather pointless ... but cute nonetheless".[75] "Jack, Meet Ethan. Ethan? Jack" scored an 8 and Mapother's acting skills were commended.[76] "Jin Has a Temper-Tantrum on the Golf Course" was deemed "hilarious" and "one of [Lost's] funniest ... moments" and worthy of a 7.5.[77] "The Envelope" was given a 6.5,[78] and "So It Begins" was given a 9â ~the highest score of any mobisodeâ ~and was described as "a shocking new look at the Christian Shephard who appeared to Jack".[79]

Oscar Dahl of BuddyTV reviewed each mobisode. "The Watch" was called "a fun couple minutes of character work", but "relatively worthless".[80] "The

Adventures of Hurley and Frogurt" was thought to be better than "The Watch".[81] "King of the Castle" was reviewed better than the previous two mobisodes and the reviewer noted that "it's a testament to ... Fox and ... Emerson's acting abilities that [it] is so intense".[82] "The Deal" was said to be even better than "King of the Castle".[83] While Dahl "always like[s] what Juliet brings to the table", he thought that "Operation: Sleeper" "serves little purpose".[84] "Room 23" was called the "best mobisode ever".[85] In regard to "Arzt and Crafts", Dahl wrote that "Lindelof wrote this mobisode ... and as a result ... it has the best dialogue of any mobisode so far".[86] He commented that "Tropical Depression" is "not totally superfluous, though the new information isn't very enlightening".[87] Dahl "liked" "Jack, Meet Ethan. Ethan? Jack", but decided "that it's not [Lindelof]'s best work".[88] Dahl wrote that "Jin Has a Temper-Tantrum on the Golf Course" is "a nice little scene", but the reviewer pointed out an inaccuracy in the scene's golf gameplay.[89] When reviewing "The Envelope", Dahl wrote that "The people over at Lost have cheated a little bit ... [but] it's still a pretty cool deleted scene".[90] After seeing "So It Begins", Dahl was "not entirely sure what to think" because the reviewer liked "showing the moments before the pilot began" and "doing a mobisode from Vincent's perspective, but adding a supposed-to-be-dead Christian to the mix is confusing".[91]

Ryan McGee of Zap2it also reviewed every mobisode. "The Watch" was described as "anticlimactic".[92] "The Adventures of Hurley and Frogurt" was described as "a little ... lacking", but McGee wrote that "'King of the Castle' proves that brevity is the soul of awesome, with a tense, information-rich two-and-a-half minutes that tingled my Spidey-esque mythology sense the entire time".[93] "The Deal" was received less favourably than the previous installment[94] McGee wrote that "Room 23" was "short but sweet".[95] "Arzt and Crafts" was called "a weak-ish entry" and it was noted that "not everything Lost does turns into Dharma-laced gold, sadly".[96] "Buried Secrets" was described as mediocre.[97] In the review for "Tropical Depression", McGee commented that "It's just not good. At all." and compared its quality to the episode "Stranger in a Strange Land" and the character Paulo,[98] both of which were negatively received by fans and critics.[99] "Jack, Meet Ethan. Ethan? Jack" had "return[ed Lost: Missing Pieces] to compelling form", however the title was called "clunky".[97] After watching "So It Begins", McGee wrote that it is "a mobisode so vital, so important that I can't believe that ABC didn't bother to air this [online] before the start of Season 4".[100]

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[edit] External links

Ambrose Rookwood (c. 1578 – 31 January 1606) was a member of the failed 1605 Gunpowder Plot, a conspiracy to replace the Protestant King James I with a Catholic monarch. Rookwood was born into a wealthy family of Catholic recusants, and educated by Jesuits at Flanders. His older brother became a Franciscan, and his two younger brothers were ordained as Catholic priests. Rookwood, however, became a horse-breeder. He married the Catholic Elizabeth Tyrwhitt, and had at least two sons.

He was enlisted into the plot in September 1605 by Robert Catesby, a religious zealot whose impatience with James's treatment of English Catholics had grown so severe that he conspired to blow up the House of Lords with gunpowder, killing the king and much of the Protestant hierarchy. With the other conspirators he had recruited, Catesby also planned to incite a rebellion in the Midlands, during which James's nine-year-old daughter Princess Elizabeth would be captured, and installed as titular queen. Rookwood's stable of fine horses was essential for the uprising to succeed.

The explosion was planned to coincide with the State Opening of Parliament on 5 November 1605, but the man left in charge of the gunpowder stored beneath the House of Lords, Guy Fawkes, was discovered there and arrested. Rookwood fled the city, and informed Catesby and the others of the plan's failure. Together the remaining conspirators rode to Holbeche House in Staffordshire, where on 8 November they were attacked by the pursuing Sheriff of Worcester and his men. Catesby was killed, but Rookwood survived, and was imprisoned in the Tower of London.

Rookwood and the survivors were arraigned on 27 January 1606 in Westminster Hall. Pleading not guilty, he claimed to have loved Catesby "above any worldly man". His subsequent request for mercy was ignored, however, and he was hanged, drawn and quartered on 31 January, in the Old Palace Yard at Westminster.

[edit] Early life

Born sometime about 1578, Ambrose Rookwood was the second of four sons born to Robert Rookwood and his second wife, Dorothea. During his first marriage to Bridget Kemp, Robert had sired four sons, but all predeceased their father.[1]

The Rookwood family had lived at Stanningfield in Suffolk for 300 years. Wealthy, and staunch Catholics, the authorities viewed them as trouble-makers. Ambrose's Papist cousin Edward had spent ten years in prison for his faith, but in 1578 he entertained Queen Elizabeth I at his home, Euston Hall. It was an expensive visit that made a serious dent in the family's finances, and which neutered their influence for years thereafter.[2] Ambrose's parents had been imprisoned for their recusancy,[3] and he was indicted on the same charge in February 1605. However, he was apparently happy to advertise his faith; in the summer of 1605 he commissioned a London cutler, John Craddock, to place a Spanish blade into a sword hilt engraved with the story of the Passion of Christ. As such weapons were generally worn in public, it was "a potentially dangerous statement of faith".[4][nb 1]

Ambrose and two of his brothers, Robert and Christopher, were educated by Jesuits at Saint-Omer, then in Flanders.[nb 2] Both brothers became priests (Ambrose's elder brother, Henry, became a Franciscan),[6] and his half-sisters Dorothea and Susanna became nuns.[3] Ambrose married into the Tyrwhitts, a prominent family of Catholics from Kettleby in Lincolnshire, and with his wife Elizabeth (cousin to Robert Keyes)[7] had at least two sons, Robert and Henry.

According to the Jesuit Oswald Tesimond, Rookwood was "well-built and handsome, if somewhat short",^{[1][8]} which he compensated for by his taste in extravagant clothing. In author Antonia Fraser's opinion, this affectation was somewhat inappropriate at a time when "clothes were supposed to denote rank rather than money".^[9] On his father's death in 1600, Rookwood inherited Coldham Hall, which subsequently became a refuge for priests.^[3] The following year he joined the Earl of Essex's abortive rebellion against the government, for which he was captured and held at Newgate Prison.^[10]

[edit] Enlisted

In August 1605 Rookwood joined the Jesuits Henry Garnet and John Gerard on a pilgrimage to the shrine of St Winefride's Well in Holywell.^[11] Late in September,^[12] he was approached by Robert Catesby, Thomas Wintour and John Wright, and invited to join what became known as the Gunpowder Plot.^[1] English Catholics had hoped that the persecution of their faith would end when James I came to the throne, as his attitude appeared to be moderate, even tolerant towards Catholics. In Catesby's view however, James had reneged on his promises.^{[13][14]} He therefore planned to kill the king by blowing up the House of Lords with gunpowder, and then inciting a popular revolt to install James's daughter, Princess Elizabeth, as titular Queen.^[15] To this end he had already helped enlist nine Catholics into the conspiracy, but was running out of money and needed to recruit more men. Rookwood was a horse-breeder, and his stable of fine mounts at Coldham Hall was needed for the Midlands uprising.^[16] He had been asked to supply them with gunpowder about a year earlier, under the pretence that it was for William Stanley's regiment in Flandersâno longer an illegal operation due to the recent Treaty of London^[7]âbut otherwise provided no funds for the conspiracy.^[16]

Although unverifiable, his wife's relationship to Robert Keyes may mean that Rookwood already suspected that something was being planned.^[3] He was at first concerned for the welfare of the Catholic lords who would be present at the explosion, but his compunction was alleviated when Catesby promised him that they would be tricked out of attending Parliament that day. Any lingering doubts Rookwood had were removed by Catesby's lie that the Jesuits had given the scheme their approval.^[6] Rookwood had stayed with the Wintours at Huddington Court, and that month with the Catholic Lacons at Kinlet Hall,^{[12][17]} but at Cateby's behest he rented Clopton House near Stratford, and moved there after Michaelmas. He took with him several Catholic religious symbols, such as chalices, crucifixes, vestments, Latin books and praying beads. These were concealed in a cellar built by the Jesuit Nicholas Owen.^[18]

Toward the end of October he joined Keyes at his lodgings in London.^[19] A few days before the planned explosion he changed his mind about the sword he had ordered John Craddock to make, and had the cutler replace the grip with a gold one. The modified sword, which in total probably cost Rookwood more than Â£20, was delivered on 4Â November.^{[4][20]}

[edit] Discovery

The existence of the plot had been revealed in an anonymous letter delivered ten days earlier to William Parker, 4th Baron Monteagle, warning him to keep away from Parliament. On the evening of 4Â November the authorities made a search of the House of Lords, where they discovered one of the plotters, Guy Fawkes, guarding a hoard of explosives. He was immediately arrested.^[21]

Fawkes had posed as a servant of fellow plotter Thomas Percy, and it was therefore Percy's name that appeared on the first arrest warrant issued by the government. News of Fawkes's capture soon spread through London, prompting Christopher Wright (brother of John) to rush to Thomas Wintour, and tell what had happened. Wintour guessed that the government was looking for Percy, and told Wright to travel to Percy's lodgings and "bid him begone". While Wintour lingered, Christopher Wright and Percy left the city, followed by Keyes, and then Rookwood. A renowned horseman, Rookwood covered 30Â miles in twoÂ hours on a single horse. Using various steeds he had left along the route, he passed Keyes at Highgate, and then Wright and Percy at Little Brickhill near Dunstable. He caught up with Catesby, who had left the previous day to prepare the uprising,

and told him what had happened in London. The group, which now included Catesby, his servant Thomas Bates, both Wright brothers, Percy and Rookwood, rode on to Dunchurch.[22]

While Fawkes was being tortured, on 6th November the government began to round up anyone they thought might be involved. Rookwood's servants, still in the house their master had so hastily departed, were questioned on the same day. His belongings at Clopton^â including several incriminating Catholic symbols^â were also taken, and by the time the plotters had reached Catesby's family home at Ashby St Ledgers, Rookwood's name was among the list of suspects drawn up by the Lord Chief Justice. The fugitives continued on to Dunchurch, where they met the recently-recruited conspirator Everard Digby, with his hunting party.[23] The next day the group stole horses from Warwick Castle, although with his fine cort^âge, Rookwood avoided the town. They then collected stored weapons from Norbrook, and continued on to Huddington. The party tried in vain to expand their number, but were shunned; no one was prepared to risk being labelled a traitor. Father Garnet, contacted at Coughton Court by Bates, wrote Catesby a letter in which he implored the group to stop their "wicked actions", before himself fleeing.[24]

[edit] Fugitive

I doe acknowledge that uppon thursday morninge beeing the 7th of November 1605 my selfe and all the other gentlemen (as I doe remember) did confesse o' sinnes to one Mr. Hamonde Preeste, at Mr. Robert Wintour his house, and amonges other my sinnes I did acknowledge my error in concealing theire intended enterprise of poudre agaynste his Ma and the State, having a scruple in conscience, the facte seeminge to mee to bee too bluddye, hee for all in generall gave me absolution without any other circumnstances beeing hastned by the multitude that were to come to him.

â Declaration of Ambrose Rookwood, 21st January 1606[25]

Rookwood was proclaimed a wanted man on 7th November. He went to confession and with the rest of the group took the sacrament^â in Fraser's opinion, a sign that none of them thought they had long to live. Through pouring rain they rode to Hewell Grange, helping themselves to further arms, ammunition and money, and finally reached Holbeche House, on the border of Staffordshire, at about 10:00^â pm that night. Tired from three days of riding, they spread in front of the fire some of the now-soaked gunpowder taken from Hewell Grange, to dry out. A stray spark landed on the powder, and Rookwood, Catesby, John Grant and another man were caught up in the resultant conflagration. Rookwood and Catesby were described as "reasonably well", but Grant was blinded.[24]

Several of the conspirators disappeared into the night, but Rookwood, Catesby, the Wright brothers, Percy and Grant stayed on.[26] They didn't have long to wait; by 11:00^â am the next day the house was surrounded by 200^â of the Sheriff of Worcester's men. In the ensuing battle, Wintour was shot in the shoulder. John and Christopher Wright were each killed. Catesby and Percy were reportedly both killed by a single musket ball. Rookwood was also shot, but survived and was quickly captured.[26] His belongings should by right have been seized by the government, but his elaborate sword apparently proved to be too great a temptation for the Sheriff's men, and disappeared without trace.[27] Rookwood and the others were taken first to Worcester, and then to the Tower of London.[28] Those conspirators still at large were rounded up shortly after.

[edit] Trial and execution

Then did he acknowledge his offence to be so heinous, that he justly deserved the indignation of the King, and of the Lords, and the hatred of the whole Common-wealth, yet could he not despair of Mercy at the hand of a Prince, so abounding in Grace and Mercy^â : And the rather, because his offence, though it were incapable of any excuse, yet not altogether incapable of some extenuation,

in that he had been neither Author nor Actor, but onely perswaded and drawn in by Catesby, whom he loved above any worldly man : and that he had concealed it, not for any malice to the Person of the King, or of the State, or for any ambitious respect of his own, but onely drawn with the tender respect, and the faithful and dear affection he bore to Mr. Catesby his Friend, whom he esteemed more dear than any thing else in the world. And this mercy he desired not for any fear of the image of death, but for grief that so shameful a Death should leave so perpetual a blemish and blot unto all Ages upon his Name and Blood. But howsoever that this was his first Offence, yet he humbly submitted himself to the Mercy of the King, and prayed, that the King would herein imitate God, who sometimes doth punish corporaliter, non mortaliter ; corporally, yet not mortally.

The gunpowder-treason: with a discourse of the manner of its discovery
(1679)[29]

Watched in secret by the king and his family, the surviving conspirators were arraigned in Westminster Hall on 27th January 1606. Some of the prisoners hung their heads "as if their hearts were full of doggedness", while others were nonchalant. All except Digby pleaded "Not Guilty".[30] Defending himself, Rookwood claimed that he had been enlisted into the plot through his friendship with Catesby, "whom he loved above any worldly man". He admitted that he could not expect mercy, but asked for it anyway, so as not to leave a "blemish and blot unto all ages".[31]

His pleas were in vain. Three days later, Digby, Robert Wintour, John Grant and Thomas Bates were hanged, drawn and quartered at the western end of St Paul's churchyard. The following day, Rookwood, Thomas Wintour, Robert Keyes and Guy Fawkes were tied to wattled hurdles and dragged by horse from the Tower, to the Old Palace Yard at Westminster a longer route than had been suffered by their fellow conspirators. Rookwood had asked to be informed when he passed by his lodgings in the Strand, so that he could open his eyes and see his wife, waiting at the window. He shouted "Pray for me, pray for me!" According to Father Gerard (who was not then present), Elizabeth answered, "I will, and be of good courage. Offer theyself wholly to God. I, for my part, do as freely restore thee to God as He gave thee unto me." For the rest of the journey he kept his eyes closed, in prayer. Thomas Wintour was the first that day to be hanged and then killed. Rookwood was next, and made a short speech to the assembled audience. He was repentant, asking God to bless the king, queen, and their "royal progeny", but "spoil[ed] all the pottage with one filthy weed" by beseeching God to make the king a Catholic. Nevertheless he seems to have been left to hang for longer than the others, before suffering the remainder of his grim sentence.[32]

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Footnotes

Notes

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Persondata

Name

Rookwood, Ambrose

Alternative names
Short description
English conspirator
Date of birth
c. 1578
Place of birth
Date of death
31 January 1606
Place of death
Westminster, London, England

Suillus pungens, commonly known as the pungent slippery Jack or the pungent Suillus, is a species of fungus in the genus *Suillus*. The fruit bodies of the fungus have slimy convex caps up to 14 cm (5.5 in) wide. The mushroom is characterized by the very distinct color changes that occur in the cap throughout development. Typically, the young cap is whitish, later becoming grayish-olive to reddish-brown or a mottled combination of these colors. The mushroom has a dotted stem up to 7 cm (2.8 in) long, and 2 cm (0.8 in) thick. On the underside on the cap is the spore-bearing tissue consisting of minute vertically arranged tubes that appear as a surface of angular, yellowish pores. The presence of milky droplets on the pore surface of young individuals, especially in humid environments, is a characteristic feature of this species. *S. pungens* can usually be distinguished from other similar *Suillus* species by differences in distribution, odor and taste. The mushroom is considered edible, but not highly regarded.

An ectomycorrhizal species, *S. pungens* forms an intimate mutualistic relationship between its underground mycelium and the young roots of the associated host tree. The fungus is limited in distribution to California, fruits almost exclusively with Monterey and bishop pine, two trees with small and scattered natural ranges concentrated in the West Coast of the United States. Several studies have investigated the role of *S. pungens* in the coastal Californian forest ecosystem it occupies. Although the species produces more fruit bodies than other competing ectomycorrhizal fungi in the same location, it is not a dominant root colonizer, and occupies only a small percentage of ectomycorrhizal root tips. The fungus's propensity to fruit prolifically despite minimal root colonization is a result of its ability to efficiently transfer nutrients from its host for its own use.

[edit] Taxonomy, classification, and phylogeny

The fungus was first described scientifically by American mycologists Harry D. Thiers and Alexander H. Smith in their 1964 monograph on North American *Suillus* species. The type collection was made on the campus of San Francisco State University in San Francisco.[1] Smith and Thiers classified *S. pungens* in section *Suilli*, a grouping of related species characterized by the presence of either a ring on the stem, a partial veil adhering to the cap margin, or a "false veil" not attached to the stem but initially covering the tube cavity.[2]

A 1996 molecular analysis of 38 different *Suillus* species used the sequences of their internal transcribed spacers to infer phylogenetic relationships and clarify the taxonomy of the genus. The results suggest that *S. pungens* was genetically similar to *S. collinitus*, *S. neoalbidipes*, *S. pseudobrevipes*, *S. luteus*, *S. brevipes*, *S. weaverae*, and certain isolates of *S. granulatus*. [3]

The specific epithet is derived from the Latin *pungens*, [4] and refers to the pungent aroma of the fruit bodies. The mushroom is commonly known as the "pungent slippery Jack" [5] or the "pungent Suillus". [6] It has also been referred to as the "slippery Jack" [7] a common name applied to several *Suillus* species.

[edit] Description

The cap of *S. pungens* is roughly convex when young, becoming plano-convex (flat on one side and rounded on the other) to somewhat flat with age, and reaches diameters of 4 to 14 cm (1.6 to 5.5 in). The cap surface is sticky to slimy when moist, becoming shiny when dried. The surface is smooth but is sometimes

streaked with the sticky glue-like cap slime when older. The cap color is highly variable in this species, and the cap is often variegated with a mixture of light and dark colors. When young it is dirty-white to olive with pale olive splotches. Maturing caps can retain the color they had when young, or become tawny to orange-yellow to reddish-brown, or a combination of these colors.[6] The cap margin is initially rolled inward and has a cottony roll of white tissue, but becomes naked and curves downward with age. The flesh is 1.2–2.8 cm (0.4–0.8 in) thick, white and unchanging in young fruit bodies, frequently changing to yellow when older.[1]

The tubes that comprise the hymenium (spore-bearing tissue) on the underside of the cap are up to 1.5 cm (0.4 in) long, adnate when young, becoming decurrent or nearly so with age. In young specimens, they are whitish to pale buff, and are covered with milky droplets that become brown to ochraceous when dried. As specimens mature the color of the pore surface changes to yellowish, and finally to dark yellow. The angular pores, which are 1.5 mm in diameter, are not radially arranged, and do not change color when bruised.[1] The stem is solid (rather than hollow), 3–7 cm (1.2–2.8 in) long, and 1–2 cm (0.4–0.8 in) thick near the top. Its shape is variable: either roughly equal in width throughout, thicker at the base, or somewhat thicker in the middle. Its surface is dry and smooth, and covered with irregularly shaped glandular dots. The dots—minute clumps of pigmented cells—are initially reddish before becoming brownish. The background color of the stem is initially whitish (roughly the same color as the tubes), but becomes more yellow with age. It does not change color when bruised, and does not have a ring. The flesh of the stem is white, and does not change color when exposed to air.[1]

The spore print is olive-brown to pale cinnamon-brown.[5] Individual spores are thin-walled, hyaline (translucent), and smooth. Their shape is ellipsoid to roughly cylindrical in face view, inequilateral when viewed in profile, and they measure 9.5–10 by 2.8–3.5 μm . The basidia (spore-bearing cells of the hymenium) are hyaline, club-shaped, four-spored, and have dimensions of 33–36 by 8–10 μm . The thin-walled cystidia are rare to scattered on the tube surface but abundant on the pores, where they usually occur in massive clusters. They appear dark brown when mounted in a dilute (3%) solution of potassium hydroxide (KOH), and are cylindric to roughly club-shaped, measuring 43–79 by 7–10 μm . They are usually encrusted with pigment, although some may be hyaline. The tissue comprising the tube is hyaline, and made of divergent to nearly parallel hyphae that are 3–5 μm wide. The pileipellis is a tissue type known as an ixotrichodermium (made of interwoven gelatinized hyphae); it stains brown in KOH, and is made of hyphae that are 4–5 μm wide. The stem cuticle is made of clusters of cystidia similar to those found in the hymenium. Clamp connections are absent in the hyphae of *S. pungens*. [1]

Several chemical tests can be employed in the field to aid in the identification of *S. pungens*. With an application of a drop of KOH, the flesh will turn vinaceous (the color of red wine), the tubes red, the cap cuticle black, and the stem cuticle pale vinaceous. With ammonium hydroxide (NH₄OH), the flesh becomes very pale vinaceous, and the tubes turn bright red. Iron(II) sulfate (FeSO₄) turns the flesh gray, the tubes dark gray to black, and the stem cuticle light gray.[1]

[edit] Edibility

The mushroom is considered edible, but not choice. Its taste is harsh, nauseating, and weakly acidic; [1] the odor is strong and ranges from pleasant, resembling bananas, to pungent.[5] When collecting for the table, young specimens are preferred, as older ones "literally seethe with fat, agitated maggots and sag with so much excess moisture that they practically demand to be wrung out like a sponge!" [5] Michael Kuo's 100 Edible Mushrooms (2007) rates the mushroom's edibility as "bad" and warns that dishes cooked with the mushroom will assume an unpleasant taste.[8]

[edit] Similar species

Suillus granulatus

Suillus placidus

Suillus pungens is characterized by the very distinct color changes that occur in the cap as it develops. The range of color variation makes it possible to misidentify the species with others whose color overlaps. *Suillus pungens* has been misidentified as *S. placidus* because of the white color of the young fruit bodies and the droplets of exudate. *S. placidus* has a wider distribution, is usually found in association with eastern white pine, is generally smaller, with a maximum cap diameter up to 9 cm (3.5 in), and has smaller spores, measuring 7-9 by 2.5-3.2 μm . It does not have any distinctive taste or odor.[9] North American *S. granulatus* is another potential lookalike species, and at maturity it is nearly identical to *Suillus pungens*. The cap of *S. granulatus* is variable in color, ranging from pale yellow to various shades of brown, while the pore surface is initially whitish, later becoming yellowish, and similar to *S. placidus*, its typical host is eastern white pine. Unlike *S. pungens*, it lacks a characteristic odor and taste.[6] The Californian species *Suillus glandulosipes* has veil material attached to the edge of the cap when young. It also lacks the distinctive changes in cap color during development, is associated with lodgepole pine, has smaller spores (6.6-8.8 by 2.5-3 μm), and lacks any obvious taste and odor. Another Californian species, *Suillus quiescens*, newly described in 2010, may resemble *S. pungens* especially at maturity. *S. quiescens* can be distinguished by its lack of white or olive colors when young and by a less glandular stem when mature.[10]

[edit] Ecology, habitat and distribution

Suillus pungens is an ectomycorrhizal (EM) basidiomycete that forms symbiotic relationships almost exclusively with Monterey pine (*Pinus radiata*) and bishop pine (*Pinus muricata*); some collections have been made under knobcone pine (*Pinus attenuata*)[1] and ponderosa pine (*Pinus ponderosa*), but only within the range of Monterey pine.[5] All these trees have small scattered natural ranges largely restricted to California.[11] An EM symbiosis is a mutualistic relationship between an EM fungus and the root tip of a compatible EM plant. The fruit bodies of *Suillus pungens* grow solitarily, scattered or in groups in humus. They are often found growing near fruit bodies of *Chroogomphus vinicolor*[7] and *Helvella lacunosa*. [5] *Suillus pungens* is often the most abundant *Suillus* in the San Francisco Bay Area. The type collection was made on the campus of San Francisco State University in San Francisco, where it occurs in abundance during the fall and winter seasons. Although it occurs most frequently in the autumn and winter,[5] it is one of the few species of *Suillus* that continue to fruit sporadically throughout the year,[1] especially in wet weather.[5] It has also been identified in the southeastern Sierra Nevada[12] and on Santa Cruz Island.[13]

A genet is a group of genetically identical individuals that have grown in a given location, all originating vegetatively from a single ancestor. Once established, genets vegetatively spread hyphae out from the root tip into the soil and may connect two or more trees to form a network of mycorrhizae. In field studies, the approximate size of fungal genets is typically estimated by collecting and mapping fruit bodies on a site, determining which fruit bodies are genetically identical by either somatic incompatibility (a method fungi use to distinguish self from non-self by delimiting their own mycelia from that of other individuals of the same species) or various molecular techniques, and

then determining the distance between identical fruit bodies.[14] In a 1996 study, mycologists Monique Gardes and Thomas Bruns hypothesized that *S.Â pungens*, an abundant fruiter in pine forests, would be dominant on the roots of the pine trees. However, by sampling underground ectomycorrhizae in addition to above-ground fruit bodies, they found that the fungus can fruit prolifically while occupying only a small fraction of the ectomycorrhizal root assemblage, which was otherwise dominated by *Russula* species and *Tomentella sublilacina*. [15][16] Gardes and Bruns hypothesized that the disparity between above- and below-ground representation may be because the fungus invests less energy in vegetative growth and persistence and more in fruiting, or alternatively, because the species is particularly efficient at acquiring carbon from its hosts and so needs to colonize only a few rootlets to obtain enough to allow abundant fruiting.[15] A 1998 study by Pierluigi Bonello and colleagues used single-strand conformation polymorphism analysis to detect minute genetic differences among *S.Â pungens* genets, and showed that most of the fruiting occurred from a single large genet. This result indicates that the fungus persists because of extensive vegetative growth, rather than frequent establishment of new genets from spores, and that it uses carbon resources efficiently.[17] The study also described a *S.Â pungens* genet with an area of approximately 300Â m² (3,200Â sqÂ ft) and a span greater than 40Â m (130Â ft) across, which was at the time the largest EM fungal genet reported.[17] The large *S.Â pungens* genet was not detected after wildfire, demonstrating that it did not survive in the absence of a host, and suggesting that spores are the primary means by which the fungus recolonizes after a fire.[16]

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The Augustinian theodicy is a type of Christian theodicy designed to respond to the evidential problem of evil. As such, it attempts to explain the probability of an omnipotent and omnibenevolent (or all-powerful and perfectly loving) God amid evidence of evil in the world. A number of variations of this theodicy have been proposed throughout history, but they typically assert that God is perfectly good, that he created the world out of nothing, and that evil is the result of the original sin of humans. The entry of evil into the world is generally explained as punishment for sin, its continued occurrence owing to the evil use of free will by humans. The Augustinian theodicy maintains that God is perfectly good and not responsible for evil or suffering.

Augustine of Hippo was the first to develop the theodicy. He rejected the idea that evil exists in itself, instead regarding it as a corruption of goodness, caused by humanity's abuse of free will. Augustine believed in the existence of a physical Hell as a punishment for sin, but argued that those who choose to accept the salvation of Jesus Christ will go to Heaven. Thomas Aquinas, influenced by Augustine, proposed a similar theodicy based on the view that God is goodness and that there can be no evil in him. He believed that the existence of goodness allows evil to exist, through the fault of humans. Augustine also influenced John Calvin, who supported Augustine's view that evil is the result of free will and argued that sin corrupts humans, requiring God's grace to give moral guidance.

The theodicy was criticised by Augustine's contemporary, Fortunatus, a Manichaean who contended that God must still be implicated in evil, and eighteenth-century theologian Francesco Antonio Zaccaria criticised Augustine's concept of evil for not dealing with human suffering. Twentieth-century philosopher John Hick presented an alternative theodicy which regards evil as necessary for the development of human beings; process theologians have argued that God is not omnipotent and so cannot be responsible for evil. Alvin Plantinga presented a free will defence in the 1980s, but this was only intended to show that God's existence is still logically possible in the face of evil, rather than to establish that his existence is probable. Some criticisms have also been derived from science, as aspects of the Augustinian theodicy run contrary to scientific consensus regarding the creation of the world and the development of life.

[edit] General form

The Augustinian theodicy was first distinguished as a form of theodicy by John Hick in *Evil and the God of Love*, written in 1966, in which he classified Augustine's theodicy and its subsequent developments as "Augustinian". Hick distinguished between the Augustinian theodicy, which is attempts to clear God of all responsibility for evil, based on human free will, and the Irenaean

theodicy, which casts God as responsible for evil but justified because of its benefits for human development.[1]

The Augustinian theodicy is a response to the evidential problem of evil,[2] which raises the concern that if God is omnipotent and omnibenevolent, there should be no evil in the world. Evidence of evil can call into question God's nature or his existence— he is either not omnipotent, not benevolent, or does not exist.[3] Theodicy is an attempt to reconcile the existence and nature of God with evidence of evil in the world by providing valid explanations for its occurrence.[2] The Augustinian theodicy asserts that God created the world ex nihilo (out of nothing), but maintains that God did not create evil and is not responsible for its occurrence.[4] Evil is not attributed existence in its own right, but is described as the privation of good— the corruption of God's good creation.[5]

The Augustinian theodicy supports the notion of original sin. All versions of the theodicy accept a literal interpretation of the Genesis creation narrative, including the belief that God created man and woman without sin or suffering. Evil is believed to be a just punishment for the fall of man: when Adam and Eve first disobeyed God and were exiled from the Garden of Eden.[6] The free will of humans is offered by the Augustinian theodicy as the continued reason for moral evil: people commit immoral acts when their will is evil.[7] The evil nature of human will is attributed to original sin; Augustinian theologians argue that the sin of Adam and Eve corrupted the will of human beings,[8] maintaining that God is blameless and good, and not himself responsible for evil.[9]

[edit] Development

[edit] Augustine

Augustine of Hippo was a Numidian philosopher and theologian who lived from 354 to 430 AD. He followed the Manichaen religion during his early life, but converted to Christianity in 386. His two major works, *Confessions* and *City of God*, develop key ideas regarding his response to suffering. In *Confessions*, Augustine wrote that his previous work was dominated by materialism and that reading Plato's works enabled him to consider the existence of a non-physical substance. This helped him develop a response to the problem of evil from a theological (and non-Manichean) perspective,[10] based on his interpretation of the first few chapters of *Genesis* and the writings of Paul the Apostle.[11] In *City of God*, Augustine developed his theodicy as part of his attempt to trace human history and describe its conclusion.[12]

Augustine proposed that evil could not exist within God, nor be created by God, and is instead a by-product of God's creativity.[13] He rejected the notion that evil exists in itself, proposing instead that it is a privation of (or falling away from) good, and a corruption of nature.[14] He wrote that "evil has no positive nature; but the loss of good has received the name 'evil.'"[15] Both moral and natural evil occurs, Augustine argued, owing to an evil use of free will,[14] which could be traced back to Adam and Eve's original sin.[7] He believed that this evil will, present in the human soul, was a corruption of the will given to humans by God, making suffering a just punishment for the sin of humans.[16] Because Augustine believed that all of humanity was "seminally present in the loins of Adam", he argued that all of humanity inherited Adam's sin and his just punishment.[17] However, in spite of his belief that free will can be turned to evil, Augustine maintained that it is vital for humans to have free will, because they could not live well without it. He argued that evil could come from humans because, although humans contain no evil, they are also not perfectly good and hence can be corrupted.[18]

Augustine believed that a physical Hell exists, but that physical punishment is secondary to the punishment being separated from God. He proposed two reasons for this: Firstly, humans have free will, and only those who choose to follow God will be forgiven and able to avoid Hell.[19] Secondly, he believed that Adam and Eve's choice to sin affected our free choice, and that humans are left unable to resist sin.[20] Augustine proposed that the grace of Jesus Christ freed humans from original sin, but he maintained that humans can only

be saved if they choose to receive grace, and that this choice is formed by the character of individual humans. Accepting that even those who will be saved continue to sin, Augustine proposed that those who choose God's grace will still go to Hell for a time to purge them of their sin, before going to Heaven.[20]

[edit] Thomas Aquinas

Thomas Aquinas, a thirteenth-century scholastic philosopher and theologian heavily influenced by Augustine,[21] proposed a form of the Augustinian theodicy in his *Summa Theologica*. Aquinas began by attempting to establish the existence of God,[22] through his Five Ways, and then attested that God is good and must have a morally sufficient reason for allowing evil to exist.[23] Aquinas proposed that all goodness in the world must exist perfectly in God, and that, existing perfectly, God must be perfectly good. He concluded that God is goodness, and that there is no evil in God.[9]

Aquinas supported Augustine's view that evil is a privation of goodness, maintaining that evil has existence as a privation intrinsically found in good.[24] The existence of this evil, Aquinas believed, can be completely explained by free will. Faced with the assertion that humans would have been better off without free will, he argued that the possibility of sin is necessary for a perfect world, and so individuals are responsible for their sin.[7] Good is the cause of evil, but only owing the fault on the part of the agent. In his theodicy, to say something is evil is to say that it lacks goodness which means that it could not be part of God's creation, because God's creation lacked nothing. Aquinas noted that, although goodness makes evil possible, it does not necessitate evil. This means that God (who is good) is not cast as the cause of evil, because evil arises out of a defect in an agent, and God is seen to be without defect.[25] Philosopher Eleonore Stump, considering Aquinas' commentary on the Book of Job, argues that Aquinas has a positive view of suffering: it is necessary to contrast Earth with heaven and remind humans that they still have the propensity to commit evil.[22] Aquinas believed that evil is acceptable because of the good that comes from it, and that evil can only be justified when it is required in order for good to occur.[26] Attempting to relieve God of responsibility for the occurrence of evil, Aquinas insisted that God merely permits evil to happen, rather than willing it.[27] He recognised the occurrence of what seems to be evil, but did not attribute to it the same level of existence that he attributed to spirituality. Like Augustine, Aquinas asserted that humans bear responsibility for evil owing to their abuse of free will.[28]

[edit] John Calvin

John Calvin, a sixteenth-century French theologian and principal figure in the development of Calvinism, was influenced by Augustine's works.[29] Unlike Augustine, Calvin was willing to accept that God is responsible for evil and suffering; however, he maintained that God cannot be indicted for it.[30] Calvin continued the Augustinian approach that sin is the result of the fall of man, and argued that the human mind, will, and affections are corrupted by sin. He believed that only the grace of God is sufficient to provide humans with ongoing ethical guidance, arguing that reason is blinded by humans' sinful nature.[31] Calvin proposed that humanity is predestined, divided into the elect and the reprobate: the elect are those who God has chosen to save and are the only ones who will be saved.[32]

[edit] Reception

[edit] Fortunatus

Augustine's *Acts or Disputation Against Fortunatus the Manichaeon*, which partly touches on the problem of evil, records a public debate between Augustine and the Manichaean teacher Fortunatus. Fortunatus criticised Augustine's theodicy by proposing that if God gave free will to the human soul, then he must be implicated in human sin (a problem that Augustine had himself considered four years earlier, in *Free Will*). Quoting the New Testament, Fortunatus proposed that evil exists beyond the evil acts people commit, and that people commit such acts because of their own flawed nature.[33] Augustine

replied by arguing that the sin of Adam constrained human freedom, in a way similar to the formation of habits.[34] This was not a teaching on original sin (a view that Augustine was yet to formulate), but on the limitations of human freedom caused by sin.[35] Fortunatus proposed that Augustine was reducing the scope of evil only to what is committed by humans, though Augustine writes that Fortunatus finally conceded the debate when he admitted that he could not defend his views on the origin of evil.[36]

[edit] Buddhism

Scholars of religion Paul Ingram and Frederick Streng argued that the teachings of Buddhism challenge Augustine's view of good and evil, proposing a dualism in which good and evil have equal value instead of casting good over evil, as Augustine did. This is similar to the Manicheist account of good and evil that the two are equal and in conflict though Buddhism teaches that the two will come to a final conclusion and transcend the conflict.[37] Ingram and Streng argued that the Augustinian theodicy fails to account for the existence of evil before Adam's sin, which Genesis presents in the form of the serpent's temptation.[37]

[edit] Francesco Antonio Zaccaria

The Italian theologian Francesco Antonio Zaccaria criticised Augustine's concept of evil in the eighteenth-century. He noted a distinction between using the term evil to imply blame (sin) and to imply lament (suffering) and argued that Augustine posited sin to have occurred before suffering. This was problematic for Zaccaria, who believed that it made Augustine seem offhand and disinterested in human suffering. For Zaccaria, Augustine's perception of evil as a privation did not satisfactorily answer the questions of modern society as to why suffering exists.[38]

[edit] John Hick

John Hick criticised the Augustinian theodicy when he developed his own theodicy in 1966. Hick supported the views of German theologian Friedrich Schleiermacher, which he classified as Irenaean, who argued that the world is perfectly suited for the moral development of humans and that this justifies the existence of evil. He insisted that, while the Augustinian theodicy attempted to justify historical occurrences of evil, the Irenaean theodicy seeks to justify God eternally. Hick saw Augustine's view that a perfect world went wrong as incoherent and contradictory, and argued that, if humans were made perfectly good, then it should have been impossible for them to have made an immoral choice. He questioned the success of the theodicy with the charge that it does not remove the blame for evil from God: Augustine presented a theology of predestination; Hick argued that, if God knew the choices that his creation would make, he must be responsible for them.[39] Hick's theodicy rejected the idea of the inheritance of sinfulness, and he believed that an eternal hell would render "a Christian theodicy impossible".[40] The Irenaean theodicy does not, as the Augustinian theodicy does, attempt to protect God from being responsible for evil; rather, it argues that God is responsible but justified for it because of the benefits it has for human development. Both theodicies stress the perfection of God's creation, but differ in why the world is seen as perfect. Augustine also believed, as Hick did, that bringing good out of evil is preferable to the evil not occurring in the first place.[41]

[edit] Process theology

In *God, Power and Evil: A Process Theodicy*, published in 1976, David Ray Griffin criticised Augustine's reliance on free will and argued that it is incompatible with divine omniscience and omnipotence. Griffin argued in later works that humans cannot have free will if God is omniscient. He contented that, if God is truly omniscient, then he will know infallibly what people will do, meaning that they cannot be free. Griffin argued that the human will could not oppose God's will, if God is omnipotent. He proposed that original sin as Augustine conceived it must itself be caused by God, rendering any punishment he wills unjust.[42]

Process theology argues that God is not omnipotent: rather than coercion, he has the power of divine persuasion, but he cannot force his will. Griffin, a

prominent process theologian, argues that God feels the pain of the world (both physically and emotionally) and does everything within his power to achieve good, but he can neither force beings to be good nor prevent evil because he does not play a coercive role in the world.[43] Process theology teaches that, rather than creating the world ex nihilo (as Augustine proposed), God created it out of a pre-existent chaos.[44]

[edit] Alvin Plantinga

In the 1980s, Alvin Plantinga presented a version of the free will defence which, he argued, demonstrated that the existence of an omnipotent benevolent God and of evil are not inconsistent. He believed that, unless it could be shown that the two are not inconsistent, they would be necessarily contradictory.[45] To do this, Plantinga believed that a "possible state of affairs" must be proposed which, if actual, would make God's existence and the existence of evil consistent.[46] He argued that a third proposition[^] that evil is the result of the actions of free, rational, fallible human beings[^] allows the existence of God and evil to be consistent.[47] Plantinga supported this argument by claiming that there are some things that an omnipotent God could not do, yet remain omnipotent[^] for example, if an omnipotent God has necessary existence, he could not create a world in which he does not exist. For this reason, Plantinga argued that an omnipotent God could not create any universe that he chooses, as Leibniz had proposed. He suggested that, even in a world where humans have free will, their actions may be so predictable that God could not create a world where they would do something unpredictable.[a] Finally, he argued that if every moral agent freely makes at least one bad moral decision in any possible universe, God cannot create a universe where there is human freedom and no evil. Plantinga maintained that the existence of an omnipotent, benevolent God and the existence of evil are not inconsistent.[49]

Plantinga's version of the defence embraces Augustine's view of free will, but not his natural theology.[50] Rather than attempt to show the existence of God as likely in the face of evil, as a theodicy does, Plantinga's free will defence attempts to show that belief in God is still logically possible, despite the existence of evil.[51] Theologian Alister McGrath has noted that, because Plantinga only argued that the coexistence of God and evil are logically possible, he did not present a theodicy, but a defence. Plantinga did not attempt to demonstrate that his proposition is true or plausible, just that it is logically possible.[47]

[edit] Critique from a scientific position

John Hick criticised Augustine's theory for being "implausible" in light of Darwin's theory of evolution, as it would make Augustine's idea of a fall from perfection inaccurate;[52] this is reiterated by Professors Nancey Murphy and George Francis Rayner Ellis, who also contend that Augustine's idea of transmitting original sin from Adam to the rest of humanity requires biological explanation.[53] Professor of Comparative Religion Arvind Sharma has argued that natural evil cannot be the result of moral evil in the way Augustine suggested: scientific consensus is that natural disasters and disease existed before humans and hence cannot be the result of human sin.[54]

The twentieth-century philosopher Reinhold Niebuhr attempted to reinterpret the Augustinian theodicy in the light of evolutionary science by presenting its underlying argument without mythology. Niebuhr proposed that Augustine rejected the Manichean view that grants evil ontological existence and ties humans' sin to their created state. Augustine's argument continued, according to Niebuhr, by proposing that humans have a tendency to sin because of a biologically inherited nature and rejected the Pelagian view that human will could overcome sin on its own.[55] Niebuhr believed Augustine's argument placed sin in the human will, which was corrupted by Adam's original sin. He argued that the logic behind Augustine's theodicy described sin as inevitable but unnecessary, which he believed captured the argument without relying on a literal interpretation of the fall, thus avoiding critique from scientific positions.[56]

^ Steve Duncan used the example of a rational man who is offered \$5 for a Rembrandt. Assuming that he understands the meaning of the transaction and has no other reason to accept the offer, it can be predicted that he will reject the offer. Duncan holds that God could not create a world where the man freely accepts the offer (without changing the situation), illustrating Plantinga's point. [48]

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Lemurs of Madagascar, currently in its third edition, is a reference work and field guide for the lemurs of Madagascar, giving descriptions and biogeographic data for the known species. The primary contributor is Russell Mittermeier, president of Conservation International, and the cover art and illustrations were drawn by Stephen D. Nash. The book provides details about all known lemur species, general information about lemurs and their history, and also helps travelers identify species they may encounter. Four related pocket field guides have also been released, containing color illustrations of each species, miniature range maps, and species checklists.

The first edition was reviewed favorably in the *International Journal of Primatology*, *Conservation Biology*, and *Lemur News*. Reviewers, including Alison Jolly, praised the book for its meticulous coverage of each species, numerous high-quality illustrations, and engaging discussion of lemur topics, including conservation, evolution, and the recently extinct subfossil lemurs. Each agreed that the book was an excellent resource for a wide audience, including ecotourists and lemur researchers. A lengthy review of the second edition was published in the *American Journal of Primatology*, where it received similar favorable comments, plus praise for its updates and enhancements. The third edition was reviewed favorably in *Lemur News*; the reviewer praised the expanded content of the book, but was concerned that the edition was not as portable as its predecessors.

The first edition identified 50 lemur species and subspecies, compared to 71 in the second edition and 101 in the third. The taxonomy promoted by these books has been questioned by researchers, such as Ian Tattersall, who view these growing numbers of lemur species as insufficiently justified inflation of species numbers (taxonomic inflation).

[edit] Overview

Lemurs of Madagascar is published by Conservation International (CI), a non-profit conservation organization headquartered near Washington, D.C., and is intended as a field guide that identifies all of the known lemur species from Madagascar.[1] The first edition of *Lemurs of Madagascar* was published in 1994 and contained 356 pages. The 520-page second edition was published in 2006 and is now officially out of print, having been followed by the 767-page third

edition in the fall of 2010.[2]

For all three editions, Stephen D. Nash, winner of the 2004 American Society of Primatologists President's Award,[3] has been the illustrator and front cover artist. The main author for all three editions is Russell A. Mittermeier, president of CI and a well-published primatologist, herpetologist and biological anthropologist.[4] In the first edition, four other authors were also listed: Ian Tattersall, a curator in the Division of Anthropology at the American Museum of Natural History; William R. Konstant, the Director of Conservation and Science at the Houston Zoo; David M. Meyers, a researcher and conservationist who has worked with CI, the World Wildlife Fund, and other conservation and development organizations; and Roderic B. Mast, marine biologist, primatologist, and the founding Director of CI's Madagascar Program.[5]

The second edition was authored by Mittermeier, Konstant, Tattersall, and Meyers, as well as seven new authors: Frank Hawkins, the Technical Director for CI in Madagascar; Edward E. Louis, the conservation geneticist for Omaha's Henry Doorly Zoo's Center for Conservation and Research; Olivier Langrand, CI's Senior Vice President for Africa and Madagascar; Jonah H. Ratsimbazafy, the Scientific Coordinator for the Durrell Wildlife Conservation Trust - Madagascar Program; Rodin Rasoloarison, a field researcher and research coordinator at the German Primate Center; J rg U. Ganzhorn, professor at in the Department of Animal Ecology and Conservation at the University of Hamburg and Chairman for the Madagascar section of the International Union for Conservation of Nature Species Survival Commission (IUCN/SSC) Primate Specialist Group since 1998; and Serge Rajaobelina, the President of Fanamby, a Malagasy non-governmental environmental organization.[4]

The list of authors changed again with the third edition. Returning authors included Mittermeier, Louis, Langrand, Hawkins, Rajaobelina, Ratsimbazafy, and Rasoloarison. New authors included Matthew Richardson, writer and member of the IUCN/SSC Primate Specialist Group; Christoph Schwitzer, the Head of Research at the Bristol Zoo Gardens; Anthony Rylands, a Senior Research Scientist at Conservation International and Deputy Chair of the IUCN/SSC Primate Specialist Group; Christian Roos, a geneticist at the German Primate Center; Peter M. Kappeler, a Professor of Sociobiology and Anthropology at the University of G ttingen in Germany; and James MacKinnon, the Senior Technical Director of Conservation International in Madagascar.[6]

The first edition followed a 1982 volume by Tattersall, entitled *Primates of Madagascar*. As a field guide, the *Lemurs of Madagascar* is "more portable and affordable," while offering updated information to assist lemur researchers and tourists in the identification of lemur species and subspecies, according to a 1996 review published in *Lemur News*. All three editions cover the natural history and conservation status for each known species. They also discuss conservation strategies, lemur origins, extinct lemurs, and the history of discoveries made by early European naturalists. The books provide suggestions on where to see each species,[1] as well as checklists to help people keep track of their sightings.[7] The purpose of the book is defined in the "Introduction" as follows:

Conservation International and the Primate Specialist Group of the World Conservation Union's Species Survival Commission (IUCN/SSC) have long recognized Madagascar as one of their top priorities, and are pleased to present this guide to facilitate field identification of lemurs, to summarize available data on their ecology, distribution and conservation status, and to stimulate further interest in the survival of these animals in their natural habitats.

  Peter A. Seligmann & Russell A. Mittermeier,   *Lemurs of Madagascar*, First Edition[8]

Four pocket field guides have also been published by CI, intended strictly to help people identify lemurs in the field by providing over 100 species

illustrations. All illustrations, including the detailed cover art, were drawn by Nash. Checklists for their respective lemur species are included with these guides, along with thumbnail range maps for each species. The four pocket guides include two editions of Lemurs of Madagascar Pocket Identification Guide (out of print), Nocturnal Lemurs, and Diurnal and Cathemeral Lemurs.[9] The Nocturnal Lemurs booklet contains 65 species from eight genera.[10] Diurnal and Cathemeral Lemurs hosts 34 species and subspecies from seven genera, along with illustrations to show male and female fur color differences in the genus Eulemur and color morphs for the indri and ruffed lemur species.[11] A fifth and sixth pocket field guides are planned following the publication of the third edition of the field guide.[12]

[edit] Content

All three editions are split into multiple chapters, sections, and appendices.[1][3] In the second and third editions, the inside of the front and back covers include a quick visual reference, with color-coded illustrations for each lemur type and colored tabs to help locate their corresponding sections. A section entitled "How to Use this Field Guide" is included between the "Introduction" and the first chapter. In this section, the layout of the book is discussed in detail, including the quick visual reference, chapters, appendices, references, and lemur-watching checklist. The chapter "The Living Lemurs" is discussed in great detail, including each section heading used for all the lemur species.[14][15]

The "Introduction" in the first two editions was written by Peter A. Seligmann, Chairman of the Board and CEO of CI, and Mittermeier.[16][17] In the third edition, the "Introduction" was written only by Mittermeier.[18] In it, they emphasize the richness of Madagascar's primate diversity, summarize the conservation efforts and opportunities for preserving that diversity, and highlight recent discoveries, while also acknowledging the need for additional research.[16][17] The chapter entitled "Origins of Lemurs" ("Origin of the Lemurs" in the third edition) briefly summarizes the theories on how lemurs came to Madagascar and the difficulty in resolving the mystery.[19][20][21] "Discovery and Study of the Living Lemurs" reviews the history of exploration, field research, and taxonomic nomenclature of lemurs,[22][23][24] starting from the 1625 description of a Ring-tailed Lemur to contemporary research by Western and Malagasy scientists.[1] "The Extinct Lemurs" discusses the recently extinct subfossil lemurs, including the monkey lemurs, sloth lemurs, and koala lemurs.[25][26][27] "Conservation of Lemurs" details the threats lemurs face, such as habitat destruction and hunting for bushmeat, and conservation efforts aimed at their protection, from the in-situ and ex-situ programs of the Madagascar Fauna Group to the promise by Madagascar's former president Marc Ravalomanana to triple the country's protected areas over five years, known as the Durban Vision.[28][29][30] In the third edition, a new chapter was added, entitled "Madagascar's Ancient Geological History", written by Maarten de Wit from the University of Cape Town. In it, three billion years of geological and biological history are explored in detail.[31]

The majority of the book, including the chapter "The Living Lemurs" and separate sections on each taxonomic group of lemur, providing detailed accounts of all lemur species known up until the time of publication, from the tiny mouse lemurs to the large indri and diademed sifaka. In the first and second editions, the chapter "The Living Lemurs" is broken first into sections on families, and then into species clumped together by genus.[32][33] In the third edition, each family is assigned its own chapter number, separate from "The Living Lemurs" chapter, yet the order and layout are the same.[34] In the second and third editions, all pages within each family section are assigned a colored tab to match those in the quick visual reference inside the covers.[33][15] Each species subsection has a distribution map, an illustration or photo (if available), a list of common names in multiple languages (including Malagasy), and species information broken into five sections: "Identification", "Geographic Range", "Natural History", "Conservation Status", and "Where to See It".[32][33]

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[The hairy-eared dwarf lemur] is absolutely one of the more difficult lemur species to find in the wild, and indeed many experts who have worked for decades in Madagascar have yet to see one. ... The best opportunities for viewing it are at the Analamazaotra Special Reserve and the ForÃt de Vohidrazana near the village of Fanovana, approximately 12 km east of Andasibe, although its observation in these areas remains very unpredictable.

â "

â ~Mittermeier, et al., Lemurs of Madagascar, Second Edition[35]

The "Identification" section for each species provides descriptive information to help identify and distinguish species, including a detailed physical description, discussions of variation in size and coloration (morphometrics), and descriptions of distinguishing vocalizations. "Geographic Range" offers textual information to accompany the provided distribution map, although the authors note that ranges change due to habitat destruction and that species may be found in new localities outside of their known range. "Natural History" summarizes what is known about the behavior and ecology of each species,[3][15][14] such as the unusual feeding strategies of the aye-aye[36] or the nest-building behavior of the ruffed lemurs.[37] Estimated populations densities and distributions, life histories, diet, social structure, and other details are provided when known. For many species, little information is given due to a lack of research, while others have been studied extensively allowing for more elaborate detail. "Conservation Status" lists the IUCN Red List of Threatened Species assessment and protected areas in which a species can be found, while also discussing specific threats to each species, the effects of local taboos (known locally as fady), the future outlook for species survival, and its coverage within protected areas. Lastly, "Where to See It" aims to promote ecotourism by helping travelers find the best lemur watching sites that can be reached quickly and with the least effort. Suggested modes of transportation are sometimes mentioned as well.[3][15][14]

The appendices differ between editions. The first edition has two appendices. The first is entitled "Lemurs Present in Protected Areas" and discusses each region and domain of Madagascar while also providing basic information and lemur species content for each protected area.[38] The second appendix, "Alternative Names for Towns and Sites in Madagascar" spells out a few alternative French and Malagasy names for some of the larger town and cities in Madagascar.[39] In the second and third editions, Appendix A, "Maps of Madagascar", contains color maps that help locate towns, protected areas, topography, rivers, forest cover, regions, and lemur watching sites.[40][41] Appendix B, entitled "Biogeographic Regions and Floristic Domains of Madagascar" discusses the regions and domains of Madagascar.[42][43] Appendix C, "Key Sites for Watching Lemurs", covers characteristics and highlights of individual national parks, reserves, and regions for lemur watching.[44][45] The third edition added Appendix D, entitled "Primate-watching and Primate Life-listing". In it, primate-watching and primate life-listing (the act of recording recording personal first sightings of a species) are promoted while their benefits to conservation are discussed.[46]

All three editions provide a "References" section,[47][48][49] with the second edition listing approximately 500 scientific papers, books, reports, and dissertations used in the creation of the book.[48] The number of references jumped to over 1,100 in the third edition.[15] Following the "References", the first edition provides a section with the color plates.[50] In contrast, the second and third editions provides color illustrations throughout the book.[3]

[edit] Reviews

In a 1996 review of the first edition in the International Journal of Primatology, Lisa Gould spoke favorably of the book, citing passages about lemur descriptions from the 17th and 18th centuries that she found entertaining and informative. She was particularly fascinated with Chapter four, "The Extinct Lemurs", and the reconstructions by Nash that accompanied the descriptions of morphology, behavior, and diet. She praised Nash's artwork as

being one of the most enjoyable aspects of the book. The book was hailed as an excellent source for identifying lemur species for both tourists and researchers.[1] The book was also briefly reviewed in College & Research Libraries News by George Eberhart in April 1996. The review noted Conservation International's promotion of ecotourism while also providing a count of the book's illustrations: 35 color plates, 50 distribution maps, and 135 drawings of postures and behaviors.[51]

In the 1996 edition (volume 2) of Lemur News, Alison Jolly praised the first edition for its "contribution to knowledge in general" and "its effect on its intended audience." Like Gould, Jolly praised the work as a field guide, as well as Nash's high-quality illustrations. She noted the attraction of Nash's subfossil lemur reconstruction, claiming that it was "rapidly becoming one of the most pirated single book illustration on the primate lecture-slide circuit." Jolly went on to praise the thoroughness of the natural history information provided for each species, including recently described species, noting that the information covered existing knowledge better than any other published literature, even when only a single paragraph was provided for poorly known species. The book was recommended not only for lemur specialists, but also for tourists, hoping it would spark an interest in ecotourism in impoverished Madagascar. The checklist of species, as well as the information on where to most easily spot them, earned a special mention from Jolly, who could only boast seeing 30 of the 50 known species at that time. Finally, the "most significant and most appreciative" audience Jolly mentioned was the Malagasy researchers, to whom Mittermeier reportedly gave 50 copies of the book during a workshop in 1995.[7]

In a 1997 review from Conservation Biology by Joelsona Ratsirarson, the book was referred to as a "remarkable achievement" for its up-to-date information, and for being the first comprehensive lemur field guide. Emphasizing many of the same highlights as Gould and Jolly, he went on to note the inclusion of captive management information, unpublished details, and the use of common names in English, French, German, and Malagasy. His critique focused on the organization of the illustrations in relation to the text, the lack of an index, and a desire for more information about the roles lemurs play in their ecosystem. Though he praised it for being useful to tourists, researchers, students, resource managers, and conservationists, he expressed concern over its lack of availability in the bookstores of Madagascar.[52]

The completely revised second edition of Lemurs of Madagascar was reviewed in detail in the American Journal of Primatology by Stacey Tecot. Each chapter, section, and appendix was thoroughly summarized, and as with the reviews of previous editions, the chapter on subfossil lemurs was noted as one of the more "fascinating" parts of the book, particularly due to its colorful and informative illustrations. Although the book received only praise, Tecot did suggest two additions for the next edition: the need for information about the processes of island biogeography and expansion on captive conservation programs aside from the Duke Lemur Center, particularly at the Lemur Conservation Foundation and St. Catherines Island. A subject index was also recommended, along with better referencing of the figures and illustrations. Otherwise, the book was praised as being better than other field guides due to its inclusion of seemingly obscure yet important details, such as how to get to lemur watching sites, travel time, where to stay, mentions of lesser-known sites, listings of species to be seen, best times to observe, and even, among other things, the number of habituated lemur groups in each area. Tecot noted that the lemur checklist promoted competitive lemur watching, similar to birdwatching, and that the color-coded sections assisted in "on-the-fly species identification." Although very satisfied with the information provided for each species, Tecot commended the promise made in this edition to more extensively cover the published literature in the upcoming third edition. Like its predecessor, the second edition was praised as an excellent tool for ecotourists and researchers. It was also noted for its attempt to promote ecotourism as a conservation strategy.[3]

This newer edition was also mentioned briefly in the 2006 edition (volume 11) of *Lemur News*. The publication announcement highlighted the extensive coverage of scientific information throughout a range of chapters and appendices. The edition is said to contain over 200 illustrations, including drawings, photos, and maps.[53]

The 2010 third edition was reviewed in *Lemur News* by Alex Dunkel. He praised the increased level of detail in the new edition, which adds additional information on geology, the history of lemur research, and numerous aspects of lemur biology. Efforts to conserve lemurs have faced steep challenges, Dunkel wrote, due to political and economic instability in Madagascar, and these challenges make the new edition especially important. However, he worried that the increased size of the book made it less portable than its predecessors.[54]

[edit] Impact on lemur taxonomy

While the first edition recognized 50[^] lemur taxa (32[^] species and 25[^] subspecies), the second edition recognized 71 lemur taxa (68[^] species and 5[^] subspecies) just 12[^] years later.[57] The second edition followed the recommendations of Colin Groves in the third edition of *Mammal Species of the World* from 2005 by recognizing newly identified nocturnal species and raising many former subspecies to species status.[58] For comparison, Tattersall's book *Primates of Madagascar* from 1982 listed only 20[^] species and 29[^] subspecies.[59] Following the publication of the second edition, Nick Garbutt recognized 87[^] species and 5[^] subspecies in his book *Mammals of Madagascar*. [60]

Not all lemur researchers agree with the species promotions supported by these books. Researchers such as Tattersall and Anne D. Yoder, director of the Duke Lemur Center, have raised concerns about taxonomic inflation.[58][61] In particular, Tattersall has noted a steep decline in polytypic lemur species, or species with defined subspecies, starting with the first edition of *Lemurs of Madagascar* and becoming more pronounced in the second edition. He noted that more than half of the new species added in the second edition were promoted subspecies and questioned whether Madagascar could produce so many monotypic species.[58]

Prior to the release of the third edition of *Lemurs of Madagascar*, many of the major contributors, as well as Colin Groves, teamed up in 2008 to compile an updated lemur species list, published under the title "Lemur diversity in Madagascar" in the *International Journal of Primatology*. In it, 99[^] lemur taxa were recognized (97[^] species and 3[^] subspecies).[62] The third edition went on to recognize 101[^] lemur taxa (97[^] species and 6[^] subspecies) and suggested that future research could reveal as many as 110 to 125 taxa.[18]

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^ a b c Mittermeier et al. 2006, pp.â 19â ^22

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^ a b Mittermeier et al. 2006, pp.â 15â ^17

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^ Mittermeier et al. 2010, pp.â 26â ^43

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^ Mittermeier et al. 2006, pp.â 37â ^51

^ Mittermeier et al. 2010, pp.â 66â ^99

^ Mittermeier et al. 1994, pp.â 49â ^75

^ Mittermeier et al. 2006, pp.â 52â ^84

^ Mittermeier et al. 2010, pp.â 8â ^17

^ a b Mittermeier et al. 1994, pp.â 77â ^268

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^ Mittermeier et al. 2010, Table of Contents

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"Speechless" is a song by the American recording artist Michael Jackson, included on his tenth studio album, *Invincible* (2001). The single was only released in Korea. The singer was inspired to write the ballad after a water balloon fight with children in Germany. Jackson collaborated on the production with musicians such as Jeremy Lubbock, Brad Buxer, Novi Novoq, Stuart Bradley and Bruce Swedien. Andra   Crouch and his gospel choir provided backing vocals. Executives at Jackson's record label, Epic Records, responded positively to the track when given a preview several months before *Invincible*'s release. "Speechless" was issued as a promotional single, receiving mixed reviews from music critics. Commentary focused on the track's a   cappellas, lyrics and music. A clip of Jackson singing "Speechless" was included in the 2009 documentary-concert film *Michael Jackson's This Is It*.

[edit] Writing and recording

Michael Jackson wrote "Speechless" after a water balloon fight with children in Germany. It took him 45 minutes.[1] In an interview with *Vibe* magazine, the musician commented, "I was so happy after the fight that I ran upstairs in their house and wrote 'Speechless'. Fun inspires me. I hate to say that, because it's such a romantic song." He added, "But it was the fight that did it. I was happy, and I wrote it in its entirety right there. I felt it would be good enough for the album. Out of the bliss comes magic, wonderment, and creativity." [2][3]

"Speechless" was one of only two songs from *Invincible* to be written solely by Jackson (the second song being "The Lost Children").[4] Jeremy Lubbock worked with the musician in arranging and conducting an orchestra. Instrumentalists on the track included Brad Buxer on keyboards, and Novi Novoq and Thomas Tally on violas. The violinists consisted of Peter Kent, Gina Kronstadt, Robin Lorentz, Kirstin Fife and John Wittenberg. The track featured backing vocals from Andra   Crouch and his gospel choir, The Andra   Crouch Singers. "Speechless" was digitally edited by Buxer and Stuart Brawley, and was mixed by Bruce Swedien,[5] who later said, "Everything with Michael is a stand-out moment but an absolutely gorgeous piece of music called 'Speechless' was really an event. Michael sings the first eight bars a   cappella. At the end, he closes it off a   cappella      it was Michael's idea to add the a   cappella parts." [6]

[edit] Composition

The lyrics to "Speechless" deal with being lost for words because of love.[7] The song opens with Jackson's singing a   cappella: "Your love is magical, that's how I feel, but I have not the words here to explain", which Rick de Yampert of *The Daytona Beach News-Journal* felt the singer "[crooned] sweetly".[5][8] The chorus includes the lines, "Speechless, speechless, that's how you make me feel. Though I'm with you, I am far away and nothing is for real." [5] A second a   cappella verse bookends the track.[9]

"Speechless" is a ballad,[10][11] and is described as an R&B, pop and soul song on the sheet music published on Musicnotes.com by Alfred Music Publishing. It adds that the track was performed in common time, with a tempo of 80   beats per minute. The song starts in the key of B   - major and transitions to C major.

After the bridge the song transitions to D Major as a choir starts singing, the last two choruses in E Major, ending with a solo a cappella ending by Jackson. The song's vocal range is from F4 to B5.[12]

[edit] Post-production and release

In June 2001, several months before the release of *Invincible*, "Speechless" was among several songs showcased from the album exclusively to executives of Jackson's music label, Epic Records (a subsidiary of Sony Music Entertainment). Other songs previewed included "Unbreakable", "The Lost Children", "Whatever Happens", "Break of Dawn", "Heaven Can Wait" and "Privacy", all of which featured on *Invincible*'s track listing.[13][14] Roger Friedman of Fox News reported that the executives who listened to the previews liked what they heard. Epic Records' president, Dave Glew, said of the tracks, "It's wonderful and amazing. Michael is singing better than ever." He added, "The ballads! The ballads are beautiful, and they're all there." [15] "Speechless" was later released as a promotional single in 2001. A remixed version of "You Rock My World", featuring rapper Jay-Z, served as the single's B-side.[16] After Jackson's death several months later, a clip of the entertainer singing "Speechless" was included in Michael Jackson's *This Is It*, a commercially successful documentary-concert film of the singer's rehearsals for his London concert series.[17]

[edit] Critical reception

"Speechless" received a mixed reaction from music journalists. Craig Seymour of *The Buffalo News* felt that the song was the only one from the album in which Jackson successfully revisited his past. The journalist said the song was reminiscent of the 1995 chart-topper "You Are Not Alone", as it sounded to him like a track that could have been written by R. Kelly, who penned the number one hit.[18] Writing for the *Chicago Sun-Times*, Jim DeRogatis described "Speechless" as a "beautifully minimal, heartfelt romantic ballad".[19] Music journalist Roger Catlin stated that the song leaned toward "neo-gospel".[9] The *New York Post* said that "Speechless" was "lullaby-like" and the best song on *Invincible*, and Jon Pareles of *The New York Times* praised Jackson's "long lines and creamy overdubbed choruses [sailing] weightlessly" in the ballad, that the journalist felt could have been "a love song to God".[20][21]

Pop music critic Robert Hilburn described "Speechless", and another song from *Invincible* ("Butterflies"), as being "as woefully generic as their titles".[7] Ben Rayner of the *Toronto Star* contested that the a cappellas in "Speechless" were enough to make a person wish that Jackson actually was unable to make a sound.[22] Michigan Daily writer Dustin J. Seibert wrote that the song was a "shining [example] of what happens when The Gloved One gets beside himself and writes smarmy crap that should be reserved for a CD changer somewhere in a preschool".[23] The *Fort Worth Star-Telegram* said that "Speechless" was one of the weaker tracks from *Invincible*. [24] Elliot Sylvester of *The Independent* felt that the song was "pure Jackson" almost to a formulaic fault".[25] The *Dallas Morning News*' Thor Christensen said that "Speechless" was "produced by Mr. Jackson in bombastic style à la Celine Dion". He added that as the track ended with an emotional Jackson, it drew a parallel with the singer's 1972 ode to a rat, "Ben".[26]

Vaughn Watson of *The Providence Journal* hailed "Speechless" as *Invincible*'s "best song, and one of Jackson's finest of any album". He added that with the song, the musician acknowledged the pain that accompanies isolation.[27] In a review of *Invincible*, *The Wichita Eagle* stated that "Speechless", "Don't Walk Away" and "Cry" were among the "sincere ballads" in which Jackson was exemplary.[28] Ada Anderson of *The Ball State Daily News* expressed the view that "Speechless" would become a popular song, and writers for the *South Florida Sun-Sentinel* stated that the ballad would take time to get used to.[29][30] The *Dayton Daily News*' Ron Rollins described the track as a "pretty love song".[31] Music critic Kevin C. Johnson thought that "Speechless" was "one of [Jackson's] typical, whispery ballads that swells as it moves along".[32] A journalist for *The Olympian* stated that the song was "gorgeous".[33]

[edit] Track listing

"Speechless" 3:18

"You Rock My World" (Track Masters Mix) (featuring Jay-Z) 3:28

[edit] Personnel

Written, composed, produced and lead vocal by Michael Jackson

Orchestra arranged and conducted by Michael Jackson and Jeremy Lubbock

Keyboards performed by Brad Buxer

Viola performed by Novi Novoq and Thomas Tally

Violin performed by Peter Kent, Gina Kronstadt, Robin Lorentz, Kirstin Fife and John Wittenberg

[edit] Thriller Live cast version

On June 21, 2010, six performers in the West End of London show Thriller Live released Speechless as a single with the official name Speechless The Tribute to Michael Jackson to commemorate the one-year anniversary of Jackson's death. All proceeds from the recording were donated to the charity War Child.[34]

[edit] Personnel

Written & originally produced by Michael Jackson

Produced, edited and mixed by Dave Loughran

Executive producer: Adrian Grant for Key Concerts & Entertainment

Vocal arrangement by John Maher

Music arranged & performed by Dave Loughran

Hammond organ performed by John Maher

Lead vocals: James Anderson, Jean-Mikhael Bague, Kieran Alleyne, Kuan Frye,

Mitchell Zhangazha, MJ Mytton-Sanneh

Choir: Britt Quentin, Hope Lyndsey Plumb, J Rome, Jenessa Qua, Linda

John-Pierre, Olamide Oshinowo, Paula Clarke, Terrence Ryan, Wayne Anthony-Cole

Mastered by Steve Kitch[35]

[edit] Track listing

Speechless (A Tribute to Michael Jackson) Single Version 4:25[36]

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[edit] References

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Sicilian Baroque is the distinctive form of Baroque architecture that took hold on the island of Sicily, off the southern coast of Italy, in the 17th and 18th centuries. The style is recognizable not only by its typical Baroque curves and flourishes, but also by its grinning masks and putti and a particular flamboyance that has given Sicily a unique architectural identity.

The Sicilian Baroque style came to fruition during a major surge of rebuilding following the massive earthquake in 1693. Previously, the Baroque style had been used on the island in a naïve and parochial manner, having evolved from hybrid native architecture rather than being derived from the great Baroque architects of Rome. After the earthquake, local architects, many of them trained in Rome, were given plentiful opportunities to recreate the more sophisticated Baroque architecture that had become popular in mainland Italy; the work of these local architects â ~ and the new genre of architectural engravings that they pioneered â ~ inspired more local architects to follow their lead. Around 1730, Sicilian architects had developed a confidence in their use of the Baroque style. Their particular interpretation led to further evolution to a personalised and highly localised art form on the island. From the 1780s onwards, the style was gradually replaced by the newly-fashionable neoclassicism.

The highly decorative Sicilian Baroque period lasted barely fifty years, and perfectly reflected the social order of the island at a time when, nominally ruled by Spain, it was in fact governed by a wealthy and often extravagant aristocracy into whose hands ownership of the primarily agricultural economy was highly concentrated. Its Baroque architecture gives the island an architectural character that has lasted into the 21st century.

[edit] Characteristics

Baroque architecture is a European phenomenon originating in 17th-century Italy; it is flamboyant and theatrical, and richly ornamented by sculpture and an effect known as chiaroscuro, the strategic use of light and shade on a building created by mass and shadow.

The Baroque style in Sicily was largely confined to buildings erected by the church, and palazzi built as private residences for the Sicilian aristocracy.[1] The earliest examples of this style in Sicily lacked individuality and were typically heavy-handed pastiches of buildings seen by Sicilian visitors to Rome, Florence, and Naples. However, even at this early stage, provincial architects had begun to incorporate certain vernacular features of Sicily's older architecture. By the middle of the 18th century, when Sicily's Baroque architecture was noticeably different from that of the mainland, it typically included at least two or three of the following features, coupled with a unique freedom of design that is more difficult to characterise in words.

1: Grotesque masks and putti, often supporting balconies or decorating various bands of the entablature of a building; these grinning or glaring faces are a

relic of Sicilian architecture from before the mid-17th century (Illustrations 2 and 9).

2: Balconies, often complemented by intricate wrought iron balustrades after 1633 (Illustrations 2 & 9), and by plainer balustrades before that date (Illustration 6).

3: External staircases. Most villas and palazzi were designed for formal entrance by a carriage through an archway in the street façade, leading to a courtyard within. An intricate double staircase would lead from the courtyard to the piano nobile. This would be the palazzo's principal entrance to the first-floor reception rooms; the symmetrical flights of steps would turn inwards and outwards as many as four times. Owing to the topography of their elevated sites it was often necessary to approach churches by many steps; these steps were often transformed into long straight marble staircases, in themselves decorative architectural features (illustration 19), in the manner of the Spanish Steps in Rome.

4: Canted, concave, or convex façades (Illustrations 1 and 6). Occasionally in a villa or palazzo, an external staircase would be fitted into the recess created by the curve.

5: The Sicilian belfry. Belfrys were not placed beside the church in a campanile tower as is common in Italy, but on the façade itself, often surmounting the central pediment, with one or more bells clearly displayed beneath its own arch, such as at Catania's Collegiata (Illustration 1). In a large church with many bells this usually resulted in an intricately sculpted and decorated arcade at the highest point of the principal façade (Illustration 3). These belfries are among the most enduring and characteristic features of Sicilian Baroque architecture.

6: Inlaid coloured marble set into both floor and walls especially in church interiors. This particular form of Intarsia developed in Sicily from the 17th century (see the floor of illustration 14).

7: Columns that are often deployed singularly, supporting plain arches and thus displaying the influence of the earlier and much plainer Norman period (Illustration 3). Columns are rarely encountered, as elsewhere in Europe, in clustered groups acting as piers, especially in examples of early Sicilian Baroque.

8: Decorated rustication. Sebastiano Serlio had decorated the blocks of ashlar in his rustication; by the end of the 16th century, Sicilian architects were ornamenting the blocks with carvings of leaves, fish-scales, and even sweets and shells; shells were later to become among the most prevalent ornamental symbols of Baroque design. Sometimes the rustication would be used for pillars rather than walls, a reversal of expectations and almost an architectural joke (illustration 2).

9: The local volcanic lava stone that was used in the construction of many Sicilian Baroque buildings, because this was the most readily available. Shades of black or grey were used to create contrasting decorative effects, accentuating the Baroque love of light and shade as demonstrated in (illustration 2).

10: The Spanish influence. The architectural influence of the ruling Spanish (Illustration 13), although this was a milder influence than that of the Normans. The Spanish style, a more restrained version of French renaissance architecture, is particularly evident in eastern Sicily, where ~ owing to minor insurrections ~ the Spanish maintained a stronger military presence. Messina's monumental Porta Grazia, erected in 1680 as the entrance to a Spanish citadel, would not be out of place in any of the towns and citadels built by the Spanish in their colonies elsewhere. The style of this arched city gate, with its ornate mouldings and scrolls, was widely copied all over Catania immediately following the quake.

While these characteristics never occur all together in the same building, and none are unique to Sicilian Baroque, it is the coupling together which gives the Sicilian Baroque its distinctive air. Other Baroque characteristics, such as broken pediments over windows, the extravagant use of statuary, and curved

topped windows and doors are all emblematic of Baroque architecture, but can all be found on Baroque building all over Europe.

[edit] Early Sicilian Baroque

Volcanic Sicily in the central Mediterranean, off the Italian peninsula, has been colonised by the Greeks, then it was under the Romans, the Byzantines, the Ostrogoths, the Muslims, the Normans, the Hohenstaufen, the Angevins and the Aragonese, after whom it became a province of the Spanish Empire and then was part of the Bourbon Kingdom of the Two Sicilies, before finally being absorbed into the Kingdom of Italy in 1860. Thus Sicilians have been exposed to a rich sequence of disparate cultures; this is reflected in the extraordinary diversity of architecture on the island.

A form of decorated classical architecture peculiar to Sicily had begun to evolve from the 1530s. Inspired by the ruined Greek architecture and by the Norman cathedrals on the island, this often incorporated Greek architectural motifs such as the Greek key pattern into late Norman architecture with Gothic features such as pointed arches and window apertures. The Sicilian Norman architecture incorporated some Byzantine elements seldom found in Norman architecture elsewhere, and like other Romanesque architecture it went on to incorporate Gothic features. This early ornate architecture differs from that of mainland Europe in not having evolved from Renaissance architecture; instead, it was developed from Norman styles. Renaissance architecture hardly touched Sicily; in the capital city of Palermo, the only remnant of the High Renaissance is a water fountain, brought from Florence when it was already 20 years old (Illustration 5).

Whatever the reason that Renaissance style never became popular in Sicily, it was certainly not ignorance. Antonello Gagini was midway through constructing the church of Santa Maria di Porto Salvo in 1536 in the Renaissance style when he died; he was superseded by the architect Antonio Scaglione, who completed the building in a Norman style. This style seems to have influenced Sicilian architecture almost up to the time of the 1693 earthquake. Even Mannerism passed the island by. Only in the architecture of Messina[2] could a Renaissance influence be discerned, partly for geographical reasons: within sight of mainland Italy and the most important port in Sicily, Messina was always more amenable to the prevailing tides of fashion outside the island. The town's aristocratic patrons would often call on Florence or Rome to provide them with an architect; one example was the Florentine Giovanni Angelo Montorsoli, who established the Tuscan styles of architecture and sculpture there in the mid-16th century. However, these influences remained largely confined to Messina and the surrounding district. It seems likely that it was the patronage of the Roman Catholic Church, removed from the influences of Roman fashion, that remained conservative in architectural taste.

This is not to say that Sicily was completely isolated from trends elsewhere in Europe. Architecture in the island's major cities was strongly influenced by the family of the sculptor Domenico Gagini, who arrived from Florence in 1463. This family of sculptors and painters decorated churches and buildings with ornate decorative and figurative sculpture. Less than a century after his family had begun to cautiously decorate the island's churches (1531³⁷), Antonio Gagini completed the proscenium-like arch of the "Capella della Madonna" in the "Santuario dell'Annunziata" at Trapani. This pedimented arch to the sanctuary has pilasters â ~ not fluted, but decorated heavily with relief busts of the saints; and, most importantly in terms of architecture, the pediment is adorned by reclining saints supporting swags linked to the central shield that crowns the pediment. This ornate pediment, although still unbroken, was one of the first signs that Sicily was forming its own style of decorative architecture. Similar in style is the Chiesa del Gesù¹ (Illustration 14), constructed between 1564 and 1633, which also shows early signs of the Sicilian Baroque.

Thus a particular brand of Baroque architecture had begun to evolve in Sicily long before the earthquake of 1693. While the majority of those buildings that can be clearly classified as Baroque in style date from around 1650, the

scarcity of these isolated, surviving examples of Sicily's 17th-century architectural history makes it hard to fully and accurately evaluate the architecture immediately before the natural disaster: the earthquake destroyed not only most of the buildings, but also most of their documentation. Yet more information has been lost in subsequent earthquakes and severe bombing during World War II.

The earliest example of Baroque on the island is Giulio Lasso's Quattro Canti, an octagonal piazza, or circus, constructed around 1610 at the crossroads of the city's two principal streets. Around this intersection are four open sides, being the streets, and four matching buildings with identical canted corners. The sides of the four buildings are curved, further heightening the Baroque design of the buildings lining the circus. These four great buildings dominating the circus are each enhanced by a fountain, reminiscent of those of Pope Sixtus V's "Quattro Fontane" in Rome. However, here in Palermo the Baroque theme continues up three storeys of the buildings, which are adorned with statues in recessed niches depicting the four seasons, the four Spanish kings of Sicily, and the four patronesses of Palermo: Saints Cristina, Ninfa, Olivia, and Agata.

While each façade of Quattro Canti is pleasing to the eye, as a scheme it is both out of proportion with the limited size of the piazza and, like most other examples of early Sicilian Baroque, can be considered provincial, naive and heavy-handed, compared with later developments.[3] Whatever its merit, it is evident that during the 17th century, the Baroque style in the hands of the local architects and sculptors was already deviating from that of mainland Italy. This localised variation on the mainstream Baroque was not peculiar to Sicily, but occurred as far afield as Bavaria, and Russia, where Naryshkin Baroque would be just as eccentric as its Sicilian cousin.

[edit] Sicilian Baroque from 1693

[edit] Earthquake and patrons

The great Sicilian earthquake of 1693 destroyed at least 45 towns and cities, affecting an area of 5600 square kilometres and causing the deaths of about 60,000 people.[4] The epicentre of the disaster was offshore, although the exact position remains unknown. Other towns which suffered severely were Ragusa, Modica, Scicli, and Ispica. Rebuilding began almost immediately.

The lavishness of the architecture that was to arise from this disaster is connected with the politics of Sicily at the time; Sicily was still officially under Spanish rule, but rule was effectively delegated to the native aristocracy. This was led by the Duke of Camastra, whom the Spanish had appointed viceroy to appease the aristocracy, who were numerous. The aristocracy was relatively concentrated compared to most of Europe, and a gentry class was missing. In the 18th century, one estimate held that there were 228 noble families, who provided Sicily with a ruling class consisting of 58 princes, 27 dukes, 37 marquesses, 26 Counts, one viscount and 79 barons; the Golden Book of the Sicilian nobility (last published in 1926) lists even more.[5] In addition to these were the younger scions of the families, with their courtesy titles of nobile or baron.

Architecture was not the only legacy of the Normans. Rule over the peasants (there was no established middle class) was also enforced by a feudal system, unchanged since its introduction following the Norman conquest of 1071. Thus the Sicilian aristocracy had not only wealth but vast manpower at their command, something that had by this time declined in many other parts of Europe. As in Southern Spain, the huge rural estates remained almost as concentrated as when they had been Roman "latifundi". The Sicilian economy, though very largely agriculturally based, was very strong, and became more so during the 18th century as shipping became more efficient and the threat of Muslim piracy died away. The export markets for lemons (for the great 18th century fashion for lemonade) and wines increased greatly, and Sicilian wheat remained, as it had been since Roman times, the backbone of the economy. The disaster that was to give Sicily its modern reputation of poverty, namely the opening-up of the American Middle West to wheat-farming, was a century away.

When it came, this permanently more than halved the price of wheat, and destroyed the old economy forever.

The aristocracy shared their power only with the Roman Catholic Church. The Church ruled by fear of damnation in the next life and of the Inquisition in the present, and consequently both upper and lower classes gave as generously as they could on all major saints' days. Many priests and bishops were members of the aristocracy. The wealth of the Church in Sicily was further enhanced by the tradition of pressing younger children of the aristocracy to enter monasteries and convents, in order to preserve the family estates from division; a large fee, or dowry, was usually paid to the Church to facilitate this, in the form of property, jewels, or money. Thus the wealth of certain religious orders grew out of all proportion to the economic growth of any other group at this time. This is one of the reasons that so many of the Sicilian Baroque churches and monasteries, such as San Martino delle Scale, were rebuilt after 1693 on such a lavish scale.

Once rebuilding began, the poor rebuilt their basic housing in the same primitive fashion as before. By contrast, the wealthiest residents, both secular and spiritual, became caught in an almost manic orgy of building. Most members of the nobility had several homes in Sicily.[6] For one thing, the Spanish viceroy spent six months of the year in Palermo and six in Catania, holding court in each city, and hence members of the aristocracy needed a town palazzo in each city. Once the palazzi in devastated Catania were rebuilt in the new fashion, the palazzi in Palermo seemed antiquated by comparison, so they too were eventually rebuilt. Following this, from the middle of the 18th century, villas to retire to in the autumn, essentially status symbols, were built at the fashionable enclave at Bagheria. This pattern was repeated, on a smaller scale, throughout the lesser cities of Sicily, each city providing a more entertaining social life and a magnetic draw for the provincial aristocrat than their country estate. The country estate also did not escape the building mania. Often Baroque wings or new façades were added to ancient castles, or country villas were completely rebuilt. Thus the frenzy of building gained momentum until the increasingly fantastical Baroque architecture demanded by these hedonistic patrons reached its zenith in the mid-18th century.

[edit] New cities

Following the quake a program of rebuilding was rapidly put into action, but before it began in earnest some important decisions would permanently differentiate many Sicilian cities and towns from other European urban developments. The Viceroy, the Duke of Camastra, aware of new trends in town planning, decreed that rather than rebuilding in the medieval plan of cramped narrow streets, the new rebuilding would offer piazze and wider main streets, often on a rational grid system. The whole plan was often to take a geometric shape such as a perfect square or a hexagon, typical of Renaissance and Baroque town planning.

This concept was still very new in the 1690s, and few new cities had had reason to be built in Europe - Christopher Wren's city plan after the Great Fire of London in 1666 having been turned down because of the complexities of land ownership there. There were some other examples such as Richelieu, Indre-et-Loire, and later Saint Petersburg. The prototype may well have been the new city of Terra del Sole, constructed in 1564. Another of the first towns to be planned using symmetry and order rather than an evolution of small alleys and streets was Alessandria in southern Piedmont. A little later, from 1711, this Baroque form of planning was favoured in the Hispanic colonies of South America, especially by the Portuguese in Brazil. In other parts of Europe, lack of finance, complex land ownership and divided public opinion made radical replanning after disaster too difficult: after 1666, London was rebuilt on its ancient plan, though new extensions to the west were partially on a grid system. In Sicily, public opinion (the public being anyone not a member of the ruling class) counted for nothing, and hence these seemingly revolutionary new concepts of town planning could be freely executed.

In Sicily, the decision was taken not just for fashion and appearance but also

because it would minimise the damage to property and life likely to be caused in future quakes. In 1693, the cramped housing and streets had caused buildings to collapse together like dominoes (a hazard that was to remain in the still cramped and narrow areas housing the poor). Architecturally and aesthetically, the big advantage of the new order of town planning was that unlike many Italian towns and cities, where one frequently encounters a monumental Renaissance church squeezed terrace fashion between incongruous neighbours, in urban Baroque design one can step back and actually see the architecture in a more conducive setting in relation to its proportions and perspective. This is most notable in the largely rebuilt towns of Caltagirone, Militello in Val di Catania, Catania, Modica, Noto, Palazzolo Acreide, Ragusa, and Scicli.

One of the finest examples of this new urban planning can be seen at Noto (Illustration 9), the town rebuilt approximately 10 km from its original site on Mount Alveria. The old ruined town now known as "Noto Antica" can still be viewed in its ruinous state. The new site chosen was flatter than the old to better facilitate a linear grid-like plan. The principal streets run east to west so they would benefit from a better light and a sunnier disposition. This example of town planning is directly attributable to a learned local aristocrat, Giovanni Battista Landolina; helped by three local architects, he is credited with planning the new city himself.

In these new towns, the aristocracy was allocated the higher areas, where the air was cooler and fresher and the views finest. The church was allocated the town centre (Illustration 8), for convenience to all, and to reflect the church's global and central position; round the pairing of cathedral and episcopal Palazzo Vescovile were built the convents. The merchants and storekeepers chose their lots on the planned wider streets leading from the main piazzas. Finally, the poor were allowed to erect their simple brick huts and houses in the areas nobody else wanted. Lawyers, doctors, and members of the few professions including the more skilled artisans - those who fell between the strictly defined upper and lower class - and were able to afford building plots, often lived on the periphery of the commercial and upper class residential sectors, but equally often these people just lived in a larger or grander house than their neighbours in the poorer areas. However, many of the skilled artists working on the rebuilding lived as part of the extended households of their patrons. In this way Baroque town planning came to symbolize and reflect political authority, and later its style and philosophy spread as far as Annapolis and Savannah in English America, and perhaps most notably Haussmann's 19th century re-designing of Paris. The stage was now set for the explosion of Baroque architecture, which was to predominate in Sicily until the early 19th century.

Later many other Sicilian towns and cities which had been either little damaged or completely untouched by the quake, such as Palermo, were also transformed by the Baroque style, as the fashion spread and aristocrats with a palazzo in Catania came to wish their palazzo in the capital to be as opulent as that in the second city. In Palermo the Church of Santa Caterina, began in 1566, was one of many in the city to be redecorated inside in the 18th century in the Baroque style, with coloured marbles.

[edit] New churches and palazzi

Of Sicily's own form of Baroque, post 1693, it has been said, "The buildings conceived in the wake of this disaster expressed a light-hearted freedom of decoration whose incongruous gaiety was intended, perhaps, to assuage the horror".[7] While this is an accurate description of a style which is almost a celebration of joie de vivre in stone, it is unlikely to be the reason for the choice. As with all architectural styles, the selection of style would have directly linked to current fashion. Versailles had been completed in 1688 in a far sterner Baroque style; Louis XIV's new palace was immediately emulated across Europe by any aristocrat or sovereign in Europe aspiring to wealth, taste, or power. Thus it was the obvious choice for the "homeless rich" of Sicily, of whom there were hundreds. The excesses of the Baroque style palazzi and country villas to be constructed in Sicily, however, were soon to make

Versailles seem a model of restraint.

As the 18th century dawned, Sicilian architects were employed to create the new palazzi and churches. These architects, often local, were able to design in a more sophisticated style than those of the late 17th century; many had been trained in mainland Italy and had returned with a more detailed understanding of the Baroque idiom. Their work inspired less-travelled Sicilian designers. Very importantly, these architects were also assisted by the books of engravings by Domenico de' Rossi, who for the first time wrote down text with his engravings, giving the precise dimensions and measurements of many of the principal Renaissance and Baroque façades in Rome. In this way, the Renaissance finally came late to Sicily by proxy.

At this stage of its development, Sicilian Baroque still lacked the freedom of style that it was later to acquire. Giovanni Battista Vaccarini was the leading Sicilian architect during this period. He arrived on the island in 1730 bringing with him a fusion of the concepts of Bernini and Borromini, and introduced to the island's architecture a unified movement and a play of curves, which would have been unacceptable in Rome itself. However, his works are considered of lesser quality than that which was to come.[8] Notable works which date from this period are the 18th century wings of the Palazzo Biscari at Catania; and Vaccarini's church of Santa Agata, also in Catania. On this building Vaccarini quite clearly copied the capitals from Guarino Guarini's *Architettura Civile*. It is this frequent copying of established designs that causes the architecture from this period, while opulent, also to be disciplined and almost reined in. Vaccarini's style was to dominate Catania for the next decades.

A second hindrance to Sicilian architects' fully achieving their potential earlier was that frequently they were only rebuilding a damaged structure, and as a consequence having to match their designs to what had been before, or remained. The Cathedral of San Giorgio at Modica (Illustration 10) is an example. It was badly damaged in the earthquake of 1613, rebuilt in 1643 in a Baroque style while keeping the medieval layout, then damaged again in 1693. Rebuilding again began in 1702, by an unknown architect. Finally, Rosario Gagliardi oversaw the façade's completion in 1760,[9] but the compromises he had to make in deference to the existing structure are obvious. While Gagliardi used the same formulae he used so successfully at the church of San Giorgio in Ragusa, here in Modica the building is heavier, and lacks his usual lightness of touch and freedom of design.

There were also at this time other influences at work. Between 1718 and 1734 Sicily was ruled personally by Charles VI from Vienna, and as a result close ties with Austrian architecture can be perceived. Several buildings on the island are shameless imitations of the works of Fischer von Erlach.[10] One Sicilian architect, Tommaso Napoli, a monk, visited Vienna twice early in the century, returning with a store of engraving and drawings. He was later the architect of two country villas of the early Sicilian Baroque period, remarkable for their concave and convex walls and the complex design of their external staircases. One villa, his Villa Palagonia begun in 1705, is the most complex and ingenious of all constructed in Sicily's Baroque era; its double staircase of straight flights, frequently changing direction, was to be the prototype of a distinguishing feature of Sicilian Baroque.

Later, a new wave of architects, who would master the Baroque sentiments, aware of Rococo interior styles beginning elsewhere to gain an ascendancy over Baroque, would go on to develop the flamboyance, freedom, and movement that are synonymous with the term Sicilian Baroque today.

[edit] High Sicilian Baroque

Around 1730, the Baroque style gradually began to break away from the defined Roman style of Baroque and gain an even stronger individuality, for two reasons: the rush to rebuild was subsiding, construction was becoming more leisurely and thoughtful; and a new clutch of home-grown Sicilian architects came to the forefront. This new generation had watched the rebuilding in the Baroque, and studied the ever more frequent engravings and architectural books

and treatises arriving from the mainland. However, they were not like their predecessors (the former students of the Romans), and consequently were able to formulate strong individual styles of their own. They included Andrea Palma, Rosario Gagliardi and Tommaso Napoli. While taking account of the Baroque of Naples and Rome, they now adapted their designs for the local needs and traditions. Their use of resources and exploitation of the sites was often wildly inventive. Napoli and then Vaccarini had promoted the use of the external staircase, which was now taken to a new dimension: churches upon the summits of a hills would be reached by fantastical flights of steps evoking Vaccarini's mentor Francesco de Sanctis's Spanish Steps in Rome.

Façades of churches often came to resemble wedding cakes rather than places of worship as the architects grew in confidence, competence, and stature. Church interiors, which until this date had been slightly pedestrian, came especially in Palermo to be decorated in a riot of inlaid marbles of a wide variety of colours. Anthony Blunt has described this decoration as "either fascinating or repulsive, but however the individual spectator may react to it, this style is a characteristic manifestation of Sicilian exuberance, and must be classed amongst the most important and original creations of Baroque art on the island". This is the key to Sicilian Baroque; it was ideally matched to the Sicilian personality, and this was the reason it evolved so dramatically on the island. Nowhere in Sicily is the development of the new Baroque style more evident than in Ragusa and Catania.

[edit] Ragusa

Ragusa was very badly damaged in 1693. The town is in two halves, divided by a deep ravine known as the "Valle dei Ponti": the older town of Ragusa Ibla, and the higher Ragusa Superiore.

Ragusa Ibla, the lower city, boasts an impressive array of Baroque architecture, which includes the Church of San Giorgio by Rosario Gagliardi, designed in 1738 (Illustration 12). In the design of this church Gagliardi exploited the difficult terrain of the hillside site. The church towers impressively over a massive marble staircase of some 250 steps, a Baroque feature, especially exploited in Sicily due to the island's topography. The tower seems to explode from the façade, accentuated by the columns and pilasters canted against the curved walls. Above the doorways and window apertures, pediments scroll and curve with a sense of freedom and movement which would have been unthinkable to those earlier architects inspired by Bernini and Borromini. The neoclassical dome was not added until 1820.

In an alley connecting Ragusa Ibla with Ragusa Superiore is the church of Santa Maria delle Scale. This church is interesting, though badly damaged in the earthquake. Only half the church was rebuilt in Baroque style, while the surviving half was kept in the original Norman (with Gothic features), thus demonstrating in one piece the evolution of Sicilian Baroque.

The Palazzo Zacco is one of the more notable Baroque buildings of the city, its Corinthian columns supporting balconies of amazing wrought iron work, while supports of grotesques mock, shock or amuse the passerby. The palazzo was built in the second half of the 18th century by the Baron Melfi di San Antonio. It was later acquired by the Zacco family, after which it is named. The building has two street façades, each with six wide balconies bearing the coat of arms of the Melfi family, a frame of acanthus leaves from which a puttino leans. The balconies, a feature of the palazzo, are notable for the differing corbels which support them, ranging from putti to musicians and grotesques. The focal points of the principal façade are the three central balconies, divided by columns with Corinthian capitals. Here the balconies are supported by images of musicians with grotesque faces.

The Cathedral of San Giovanni Battista in Ragusa Superiore was built between 1718 and 1778. Its principal façade is pure Baroque, containing fine carvings and sculptures. The cathedral has a high Sicilian belfry in the same style. The ornate Baroque interior is separated into three colonnaded aisles (Illustration 3). Ragusa Superiore, the most badly damaged part of the town, was replanned following 1693 around the cathedral and displays an unusual phenomenon of

Sicilian Baroque: the palazzi here are peculiar to this town, of only two storeys and long, with the central bay only emphasised by a balcony and an arch to the inner garden. This very Portuguese style, probably designed to minimise damage in future earthquakes, is very different from the palazzi in Ragusa Ibla, which are in true Sicilian style. Unusually, Baroque lingered on here until the early 19th century. The last palazzo built here was in the Baroque form but with columns of Roman Doric and neoclassical balconies.

[edit] Catania

Sicily's second city, Catania, was the most damaged of all the larger cities in 1693, with only the medieval Castello Ursino and three tribunes of the cathedral remaining. Thus it was replanned and rebuilt. The new design separated the city into quarters, divided by two roads meeting at an intersection known as the Piazza del Duomo (Cathedral Square). Rebuilding was supervised by the Bishop of Catania, and the city's only surviving architect, Alonzo di Benedetto. Di Benedetto headed a team of junior architects called in from Messina, which quickly began to rebuild, concentrating first on the Piazza del Duomo. Three palazzi are situated here, the Bishop's Palace, the Seminario and one other. The architects worked in complete harmony and it is impossible to distinguish di Benedetto's work from that of his junior colleagues. The work is competent but not remarkable, with decorated rustication in the 17th-century Sicilian style, but often the decoration on the upper floors is superficial. This is typical of the Baroque of this period immediately after the earthquake.

In 1730, Vaccarini arrived in Catania as the appointed city architect and immediately impressed on the architecture the Roman Baroque style. The pilasters lose their rustication and support Roman type cornices and entablatures, or curved pediments, and free-standing columns support balconies. Vaccarini also exploited the local black lava stone as a decorative feature rather than a general building material, using it intermittently with other materials, and spectacularly for an obelisk supported on the back of the Catanian heraldic elephant, for a fountain in the style of Bernini in front of the new Town hall. Vaccarini's principal façade to Catania's cathedral, dedicated to Santa Agata, shows strong Spanish influences even at this late stage of Sicilian Baroque. Also in the city is Stefano Ittar's Church of the Collegiata, built around 1768. It is an example of Sicilian Baroque at its most stylistically simple.

[edit] Church interiors

Sicilian church exteriors had been decorated in elaborate styles from the first quarter of the 17th century, with profuse use of sculpture, stucco, frescoes, and marble (Illustration 14). As the post-earthquake churches were becoming completed in the late 1720s, interiors also began to reflect this external decoration, becoming lighter and less intense (compare illustration 14 to the later interior of illustration 15), with profuse sculpted ornamentation of pillars, cornices, and pediments, often in the form of putti, flora, and fauna. Inlaid coloured marbles on floors and walls in complex patterns are one of the most defining features of the style. These patterns with their roundels of porphyry are often derived from designs found in the Norman cathedrals of Europe, again demonstrating the Norman origins of Sicilian architecture. The high altar is usually the place de resistance: in many instances a single block of coloured marble, decorated with gilt scrolls and swags, and frequently inset with other stones such as lapis lazuli and agate. Steps leading to the altar dais are characteristically curving between concave and convex and in many cases decorated with inlaid coloured marbles. One of the finest examples of this is in the church of St Zita in Palermo.

The building of Sicily's churches would typically be funded not just by individual religious orders but also by an aristocratic family. Contrary to popular belief, the majority of Sicily's nobility did not choose to have their mortal remains displayed for eternity in the Capuchin catacombs of Palermo, but were buried quite conventionally in vaults beneath their family churches. It has been said, though, that "the funeral of a Sicilian aristocrat was one of the great moments of his life".[11]Funerals became tremendous shows of wealth;

a result of this ostentation was that the stone memorial slabs covering the burial vaults today provide an accurate barometer of the development of Baroque and marble inlay techniques at any specific time. For instance, those from the first half of the 17th century are of simple white marble decorated with an incised armorial bearing, name, date, etc. From c. 1650, small quantities of coloured marble inlay appear, forming patterns, and this can be studied developing until, by the end of the century, the coats of arms and calligraphy are entirely of inset coloured marble, with decorative patterned borders. Long after Baroque began to fall from fashion in the 1780s, Baroque decor was still deemed more suitable for Catholic ritual than the new pagan-based neoclassicism.

The Church of San Benedetto in Catania (Illustrations 15 and 16) is a fine example of a Sicilian Baroque interior, decorated between 1726 and 1762, the period when Sicilian Baroque was at the height of its fashion and individuality. The ceilings were frescoed by the artist Giovanni Tuccari. The most spectacular part of the church's decoration is the nun's choir (Illustrations 16), created c. 1750, which was designed in such a way that the nuns' voices could be heard during services, but the nuns themselves were still quite separate from and unseen by the less spiritual world outside.

[edit] Palazzi interiors

With but a few notable exceptions, the interiors of the palazzi were from the start less elaborate than those of Sicily's Baroque churches. Many were finished without ornate interior decoration, simply because they took so long to build and by the time they were completed Baroque had passed from fashion; the principal rooms were therefore decorated in the new neoclassical style known as "Pompeian". Often one can find a fusion of the two styles, as in the ballroom wing of the Palazzo Aiutamicristo in Palermo, built by Andrea Giganti in 1763, where the ballroom ceiling was frescoed by Giuseppe Cristadoro with allegorical scenes framed by Baroque gilded motifs in plaster. This ceiling was already old-fashioned when it was finished, and the rest of the room was decorated in a far simpler mode.[12] Changing use over the past 250 years has simplified palazzo decor further, as the ground floors are now usually shops, banks, or restaurants, and the upper floors divided into apartments, their interiors lost.

A further reason for the absence of Baroque decoration, and the most common, is that most rooms were never intended for such decoration. Many of the palazzi were vast, meant for huge numbers of people. The household of the Sicilian aristocrat, beginning with himself, his wife and many children, would typically also contain a collection of poorer relatives and other extended family members, all of whom had minor apartments in the house. Moreover there were paid employees, often including a private chaplain or confessor, a major domo, governesses, secretary, archivist, accountant, librarian, and innumerable lower servants, such as a porter to ring a bell a prescribed number of times according to the rank of an approaching guest. Often the servants' extended families, especially if elderly, also lived in the palazzo. Thus many rooms were needed to house the household. These everyday living quarters, even for the "Maestro and Maestra di Casa", were often simply decorated and furnished. Further rooms were required by the Sicilian tradition that it was a sign of poor breeding to permit even mere acquaintances to stay in local inns. Any visiting foreigner, especially an Englishman, was regarded as a special trophy and added social prestige. Hence the Sicilian aristocrat's home was seldom empty or quiet.

As in the rest of Italy, the finest and most decorated rooms were those on the piano nobile, reserved for guests and entertaining. Entered formally from the external Baroque double staircase, these rooms consisted of a suite of large and small salons, with one very large salon being the principal room of the house, often used as a ballroom. Sometimes the guest bedrooms were sited here too, but by the end of the 18th century they were more often on a secondary floor above. If decorated during the Baroque era, the rooms would be profusely ornamented. Walls were frequently mirrored, the mirrors inset into gilded

frames in the walls, often alternating with paintings similarly framed, while moulded nymphs and shepherdesses decorated the spaces between. Ceilings were high and frescoed, and from the ceiling hung huge coloured chandeliers of Murano glass, while further light came from gilded sconces flanking the mirrors adorning the walls. One of the most notable rooms in this style is the Gallery of Mirrors in Palermo's Palazzo Valguarnera-Gangi (Illustration 17). This room with its frescoed ceiling by Gaspare Fumagalli is, however, one of the few Baroque rooms in this Baroque palazzo, which was (from 1750) extended and transformed by its owner Marianna Valguarnera, mostly in the later neoclassical style.[13]

Furniture during the Baroque era was in keeping with the style: ornate, gilded and frequently with marble used for tabletops. The furniture was transient within the house, frequently moved between rooms as required, while leaving other rooms unfurnished. Sometimes furniture was specifically commissioned for a certain room, for example to match a silk wall panel within a gilt frame. As in the rest of Europe, the furniture would always be left arranged against a wall, to be moved forward by servants if required, never in the later conversational style in the centre of a room, which in the Baroque era was always left empty so as better to display the marble, or more often ceramic, patterned floor tiles.

The common element to both church and palazzi interior design was the stucco work. Stucco is an important component of the Baroque design and philosophy, as it seamlessly combines architecture, sculpture, and painting in three-dimensional form. Its combination with trompe l'oeil ceilings and walls in Baroque illusionistic painting confuses reality and art. While in churches the stucco could represent angels and putti linked by swags of flowers, in a private house it might represent the owner's favourite foods or musical instruments.

[edit] Final period

As with all architectural styles, people eventually tired of Baroque. In some parts of Europe, it metamorphosed into the rococo, but not in Sicily. No longer ruled by Austria, Sicily, from 1735 officially the Kingdom of Sicily, was ruled by the King of Naples, Ferdinand IV. Hence Palermo was in constant association with the principal capital Naples, where there was architecturally a growing reversion to the more classical styles of architecture. Coupled with this, many of the more cultured Sicilian nobility developed a fashionable obsession with all things French, from philosophy to arts, fashion, and architecture. Many of them visited Paris in pursuit of these interests and returned with the latest architectural engravings and theoretical treatises. The French architect Léon Dufourny was in Sicily between 1787 and 1794 to study and analyse the ancient Greek temples on the island. Thus Sicilians rediscovered their ancient past, which with its classical idioms was now the height of fashion. The change in tastes did not come about overnight. Baroque remained popular on the island, but now Sicilian balconies, extravagant as ever, would be placed next to severe classical columns. Dufourny began designing in Palermo, and his "Entrance Temple" (1789) to the Botanical Gardens was the first building in Sicily in a style based on the Greek Doric order. It is pure neoclassical architecture, as established in England since 1760, and it was a sign of things to come.

It was Dufourny's great friend and fellow architect Giuseppe Marvuglia who was to preside over the gradual decline of Sicilian Baroque. In 1784 he designed the Palazzo Riso-Belmonte, the finest example of this period of architectural transition, combining both Baroque and Palladian motifs, built around an arcaded courtyard providing Baroque masses of light and shade, or chiaroscuro.[14] The main façade, punctuated by giant pilasters, also had Baroque features, but the skyline was unbroken. The pilasters were undecorated, simple, and Ionic, and supported an undecorated entablature. Above the windows were classical unbroken pediments. Sicilian Baroque was waning.

Another reason for the gradual decline in the development of Sicily's Baroque and building in general was that the money was running out. During the 17th century, the aristocracy had lived principally on their landed estates, tending

and improving them, and as a result their income also increased. During the 18th century, the nobility gradually migrated towards the cities, in particular Palermo, to enjoy the social delights of the Viceroy's court and Catania. Their town palazzi grew in size and splendour, to the detriment of the abandoned estates, which were still expected to provide the revenue. The land agents left to run the estates over time became less efficient, or corrupt, often both. Consequently, aristocratic incomes fell. The aristocracy borrowed money using the estates as surety, until the value of the neglected estates fell below the money borrowed against them. Moreover, Sicily was by now as unstable politically as its nobility were financially. Ruled from Naples by the weak Ferdinand IV and his dominant wife, Sicily had declined to the point of no return long before 1798 and again in 1806 when the King was forced by the invading French to flee Naples to Sicily. The French were kept at bay from Sicily only by an expeditionary force of 17,000 British troops, and Sicily was now ruled by Britain in effect if not in name. King Ferdinand then in 1811 imposed the first taxes, at a single stroke alienating his aristocracy.

The tax was rescinded by the British in 1812, who then imposed a British style constitution on the island. One legal innovation of this time of particular consequence for the aristocracy was that creditors, who had previously only been able to enforce repayments of the interest on a loan or mortgage, could now seize property. Property began to change hands in smaller parcels at auctions, and consequently a land-owning bourgeoisie immediately began to flourish. Revolts against the Bourbons in 1821, and 1848 divided the nobility, and liberalism was in the air. These factors coupled with the social and political upheaval of the following Risorgimento in the 19th century meant the Sicilian aristocracy was a doomed class. Furthermore, because of their neglect and dereliction of noblesse oblige, an essential element of the feudal system, the countryside was often ruled by bandits outside the enclosed villages, and the once grand country villas were decaying. The building mania of the Sicilian upper class was over.

However, the British influence in Sicily was to provide Sicilian Baroque with one last flourish. Marvuglia, recognising the new fashion for all things British, developed the style he had first cautiously used at Palazzo Riso-Belmonte in 1784, combining some of the plainer, more solid elements of Baroque with Palladian motifs rather than Palladian designs. The late Sicilian Baroque was similar in style to the Baroque popular in England at the beginning of the 18th century, popularised by Sir John Vanbrugh with such edifices as Blenheim Palace. An example is Marvuglia's Church of San Francesco di Sales, which is almost English in its interpretation of Baroque. However, this was a temporary success and the neoclassical style was soon dominant. Few aristocrats could now afford to build, and the new style was mainly used in public and civil buildings such as those at the Botanical Gardens in Palermo. Sicilian architects â ~ even Andrea Giganti, once a competent architect in Baroque â ~ now began to design in the neoclassical style, but in this case in the version of the neoclassical adopted by fashionable France. Giganti's Villa Galletti at Bagheria is clearly inspired by the work of Ange-Jacques Gabriel.

As with the early days of Sicilian Baroque, the first buildings of the new neoclassical era were often copies or hybrids of the two styles. The Palazzo Ducezio (Illustration 19) was begun in 1746, and the ground floor with arcades creating play of light and shadow is pure Baroque. However, when a few years later the upper floor was added, despite the use of Baroque broken pediments above the windows, the neoclassical French influence is very pronounced, highlighted by the central curved bay. The Sicilian Baroque was gradually and slowly being superseded by French neoclassicism.

[edit] Legacy

Sicilian Baroque is today recognised as an architectural style, largely due to the work of Sacheverell Sitwell, whose *Southern Baroque Art* of 1924 was the first book to appreciate the style, followed by the more academic work of Anthony Blunt.

Most of the Baroque palazzi continued in private ownership throughout the 19th

century, as the old aristocracy either married middle-class money or fell further into debt. There were a few exceptions and some of these retain the ancestral palazzo still today. Thanks to the continuing religious devotion of the Sicilian people many of the Sicilian Baroque churches are today still in the use for which they were designed.

However, much of the blame for the decay and ruinous state of preservation of so many palazzi must fall not just on owners unwilling to accept change, but the political agendas of successive socialist governments. Some of the finest Baroque villas and palazzi, including the Palermo palace of the Prince of Lampedusa, are still in ruins following the United States bombing raids of 1943. In many cases, no attempt has been made to restore or even secure them. Those that survived the raids in good repair are often sub-divided into offices or apartments, their Baroque interiors dismantled, divided, and sold.

The remaining members of the Sicilian aristocracy who still inhabit their ancestral palazzi are unable to make opening their houses to tourism a major source of income, unlike some Northern, especially English, counterparts. The local equivalent of the National Trust is very small, and there is much less local interest among the general population. The Princes, Marquesses, and Counts of Sicily still living in their houses dwell in splendid isolation, surrounded often by beauty and decay. It is only today both owners and the state are awakening to the possibility that if action is not taken soon it will be too late to save this particular part of the Sicilian heritage.

As Sicily now becomes a more politically stable, secure and less corrupt environment, the Baroque palazzi are slowly beginning to open their doors to an eager paying public, American and Northern European as much as Italian. In 1963, when the movie *The Leopard* was released the Gangi Palace ballroom was almost unique in its status of having been a film set, but today long unused salons and ballrooms are hosting corporate and public events. Some palazzi are offering a bed and breakfast service to paying guests, once again providing impressive hospitality to visitors to Sicily, the purpose for which they were originally intended.

In 2002, UNESCO selectively included Baroque monuments of Val di Noto into its World Heritage List as "providing outstanding testimony to the exuberant genius of late Baroque art and architecture" and "representing the culmination and final flowering of Baroque art in Europe.[15]

[edit] Notable architects of Sicilian Baroque

^ "Palazzo" (pl. palazzi): is any large building in a town, state or private (often much smaller than the term palace implies in the English-speaking world). While palazzo is the technically correct appellation, and postal address, no Sicilian aristocrat would ever use the word, instead referring to his or her own house, however large, as "casa". "Palazzo" followed by the family name was the term used by officials, tradesmen, and delivery men. Gefen, p. 15.

^ Messina, once Sicily's second city, fell into poverty and obscurity following punitive measures against it by the Spanish following an uprising in 1626. Closely related for geographical reasons to mainland Italy, Messina once contained some of Sicily's finest buildings. The combined effect of earthquakes in 1693, 1783 and 1908, and bombing raids in 1943, robbed the city of virtually all of these.

^ Blunt, *Sicilian Baroque*, pp. 9 & 31.

^ Italy's earthquake history, 31 October 2002, BBC NEWS

^ Gefen, p. 8.

^ The Prince of Lampedusa, author of *The Leopard*, wrote of his family's six homes: a townhouse in Palermo, a villa at Bagheria, a palazzo at Toretta, a country house at Reitano, a "great" castle at Santa Marherita de Belice, and "two where we never went": a castle and house at Palma de Montechiaro ("I luoghi della mia prima infanzia" ["Places of my Infancy"]).

^ Mary Miers, "Power and Glory: Paintings of the Sicilian Baroque" *Country Life* (1 Nov. 2004); reproduced on the website of John Martin Gallery, London.

- ^ Blunt, Sicilian Baroque.
- ^ Blunt, Sicilian Baroque, p. 150.
- ^ Johann Bernhard Fischer von Erlach had begun to rebuild Schönbrunn Palace in 1686 in a simple form of Baroque; this form was later to be reproduced in Sicily in the final years of its Baroque era. The palace also had an external staircase (removed in 1746) similar to those that later evolved in Sicily (Guide to the Castles of Europe, retrieved 11 March 2009; Brook-Shepherd, pp. 213-221).
- ^ Gérard Gefen, Land of the Leopard Princes.
- ^ Photograph of the ceiling of the ballroom of the Palazzo Aiutamicristo
- ^ The room was used for the ballroom scene of Visconti's *The Leopard* (Begley).
- ^ The Palazzo is today a shell, badly damaged by bombing in World War II.
- ^ "Noto (Italy)". Evaluation and justification for UNESCO, June 2002.

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[edit] External links

Mom and Dad (known as *The Family Story* in the United Kingdom)[3] is a feature-length 1945 film directed by William Beaudine, and largely produced by the exploitation film maker and presenter Kroger Babb. Mom and Dad is considered the most successful film within its genre[4] of "sex hygiene" films. Although it faced numerous legal challenges and was condemned by the National Legion of Decency,[5] it went on to become one of the highest-grossing films of the 1940s.

The film is regarded as an exploitation film as it was repackaged controversial content designed to establish an educational value that might circumvent U.S. censorship laws. Babb's marketing of his film incorporated old-style medicine show techniques, and used unique promotions to build an audience. These formed a template for his later works, which were imitated by his contemporary filmmakers. In 2005, the film was added to the United States National Film Registry, in recognition of its numerous achievements.

[edit] Production

Despite the commercially successful run of Babb's debut film, *Dust to Dust* a reworked version of the 1938 film *Child Bride* his production company Cox and Underwood disbanded, forcing him to form his own unit, Hygienic Productions.[6] Having attended a meeting in Burkburnett, Texas, that discussed the alleged impregnations of young women by G.I.s from nearby Sheppard Air Force Base, Babb was inspired to shoot a film based on the subject.[7] His future wife Mildred Horn drafted a screenplay which later evolved into *Mom and Dad*. Babb located 20 investors willing to fund the movie, and hired William Beaudine as director.[8]

Production of the film cost Babb and his investors a total of \$63,000.[4] The movie was shot in five separate studios over six days in 1944,[2] and was

spread across various Monogram Pictures lots; co-producer J. S. Jossey was a Monogram stockholder. On January 3, 1945, Mom and Dad premiered at the Warner Bros. theatre in Oklahoma City, Oklahoma.[2]

The plot is padded with a large amount of filler. Films of this type were usually produced quickly and at minimal cost, and while filler was sometimes used to increase the production value, the usual motivation was to extend its running time to qualify for feature length status. Eric Schaefer notes that the "primary purpose" of the plot of Mom and Dad was to "serve as the vehicle onto which the spectacle of the clinical reels can be grafted", such as the live birth scene. The marketing materials suggest the latter reason also, and many posters for the film promised that "You [will] actually SEE the birth of a baby!"[9] The dialogue is carefully worded, and uses period euphemisms rather than explicit terms that may have been controversial at the time. In particular, at no time does the film specifically mention sexual intercourse or pregnancy.[8]

Mom and Dad tells the story of Joan Blake (June Carlson), a young girl who falls for the pilot Jack Griffin (Bob Lowell). After being sweet talked by Griffin, she has sex with him. The girl requests "hygiene books" from her mother Sarah Blake (Lois Austin); however, the mother refuses because the girl is not yet married. The girl later learns from her father Dan Blake (George Eldredge) that the pilot has died in a crash. She tears up a letter she had been writing to him, and lowers her head as the film fades into intermission.

The film resumes at the point when the girl discovers that her clothes no longer fit, sending her into a state of despair. She takes advice from her teacher, Carl Blackburn (Hardie Albright), who had previously been fired for teaching sex education. Blackburn blames her mother for the problem, and accuses her of "neglect[ing] the sacred duty of telling their children the real truth." Only then is the girl able to confront her mother.[2][8]

The film then presents reels and charts that include graphic images of the female anatomy and footage of live births - one natural and one Caesarian. In some screenings, a second film was shown along with Mom and Dad, and contained images portraying syphilis and venereal disease. Mom and Dad is believed to have had a number of endings, although most typically concluded with the birth of the girl's child, sometimes stillborn and other times put up for adoption.[8][10]

Hardie Albright â ^ Carl Blackburn, the teacher.

Lois Austin â ^ Sarah Blake, the mother.

George Eldredge â ^ Dan Blake, the father.

June Carlson â ^ Joan Blake, the teen-age girl.

Jimmy Clark â ^ Joan's brother.

Bob Lowell â ^ Jack Griffin, the pilot.

Jane Isbell â ^ Mary Lou, Joan's friend.

Jimmy Zaner â ^ Allen Curtis, Joan's hometown boyfriend.

Robert Filmer â ^ Superintendent McMann.

Willa Pearl Curtis â ^ Junella, the Blake family's African-American maid.

Virginia Van â ^ Virginia, Dave's girlfriend.

Forrest Taylor â ^ Dr. Ashley, the obstetrician.

Jack Roper â ^ The coach.

The official credits also acknowledge The Four Liphams as well as the California State Champion dancers of the jitterbug.[2]

[edit] Marketing and presentation

In a Washington Post article covering Babb's career, the film critic Kenneth Turan wrote that Mom and Dad did not "flourish because of its birth footage" or because of its puerile plot, which Babb himself disparages. "Its success flowed, rather, from Babb's extraordinary promotional abilities." [11] The film was exhibited across the United States, and over 300 prints were produced.[4] In the weeks preceding the screening, local presenters sought to attract the attention of the town's inhabitants by distributing letters to local newspapers and church leaflets protesting against the film's moral basis. This strategy often utilized fabricated letters supposedly written by the mayor of a nearby

city, who wished to register concern about local young women in his area who had seen the film and were awakened enough to discuss problems similar to their own.[12]

The campaigns were usually orchestrated by employees of either Hygienic or Hallmark Productions,[8] and they nominally based their campaign from information provided by a standard and detailed pressbook containing cast and crew information, as well as other promotional and marketing materials.[2] Babb's marketing strategy centered on overwhelming small towns with advertisements and letters, in an attempt to create a controversial atmosphere. In keeping with his motto of "You gotta tell 'em to sell 'em,"[2] the film became so ubiquitous that Time wrote that its presentation "left only the livestock unaware of the chance to learn the facts of life." [4]

The local pitch included a variety of limited screenings, including adults-only showings, viewings segregated by gender, and a live lecture by the "Fearless Hygiene Commentator Elliot Forbes" which was often placed during the intermission. At any one time, a number of "Elliot Forbes"es would give simultaneous talks in a number of locations showing the film.[13] In some predominantly African-American areas, Olympic gold medalist Jesse Owens was hired to make appearances instead of an actor playing Forbes.[8] The "Elliot Forbes" actors were usually people local to the production company, sometimes out-of-work performers.[14] Along with "Forbes", presentations were often held with "nurses" in attendance, ostensibly in the event that someone fainted due to the content of the film;[8] such "nurses" were often hired locally.[15]

Modern Film Distributors later distributed the film, and sold over forty-five thousand copies of the books Man and Boy and Woman and Girl following Forbes's lecture. The text was written by Babb's wife,[16] and was filled with both biological and sexual education materials relevant to the film's subject matter; generating extra profit items for their distributors. The sales of these books netted an estimated \$31,000 for the distribution company,[17] while Babb estimated the total sales for all distributions at 40 million copies.[16]

Babb insisted that the program be followed closely; a contractual agreement with theaters required that each presentation follow a similar approach. Because the Forbes lecture formed part of the viewing, extra newsreels or short films were not permitted, although previews were allowed. A contractual agreement disallowed matinee pricing, set specific times for the segregated viewings, and prohibited the screening of the film on Sundays.[13]

[edit] Reception

It is claimed that Mom and Dad is the third highest grossing film of the 1940s in dollar value,[4] and returned close to \$63 for each dollar invested by its backers.[18] The Los Angeles Times estimates that the film grossed between \$40 million and \$100 million,[11] and it has been cited as the most successful sex hygiene film ever released. It remains the most profitable pre-1960 exploitation film; ranking among the top ten grossing films of both the 1940s and 1950s, even when scaled against those year's mainstream releases.[19]

The film was at the center of many high profile lawsuits and condemnations. The exploitation genre was pitched against numerous challenges during the 1940s and 1950s, and fought many local censorship battles, and fought bitterly against the motion picture censorship system.[20] It has been claimed that nearly 428 lawsuits were laid against both Babb and Mom and Dad during the film's run.[11] Babb often used the supposed educational value of his films as an offer of defense, and recommended such tactic to theater owners in his pressbooks. One successful challenge was in New York City, where Mom and Dad remained censored until 1956, when the Appellate Division of the New York State Supreme Court overturned the ruling of the censorship board, deciding that human birth did not qualify as "indecent".[21]

According to Modern Film Distributors, as of the end of 1956, the film has been dubbed into a dozen languages and attended by an estimated worldwide attendance figure of over 175 million people, at over 650,000 performances.[2]Card Mondor purchased the rights to exhibit the film in New Zealand and Australia during the mid-1960s, almost twenty years after the

film's debut.[14] In the late 1970s, a story on Babb by the Press-Enterprise estimated that the film had been dubbed into 18 languages.[16]

The film's success spawned a number of imitators, who sought to saturate the market with genre imitations. In particular, Street Corner recycled Babb's plot, substituting a concerned physician for a concerned teacher. In 1948, Universal produced a similar film, *The Story of Bob and Sally*, but was unable to screen it due to the production code, and eventually sold the rights.[22] The volume of imitations led to the formation of Modern Film Distributors, a group of exploitation filmmakers, in an effort to minimize booking conflicts.[8]

In 1969, the film was submitted to the Motion Picture Association of America for a film rating, in order to allow the film be shown in traditional movie theaters; it received an R rating.[23][24] The movie was such a success that it is still shown decades later around the world.[16] In 2005, a version was added to the National Film Registry.[4]

[edit] References

- ^ Schaefer, 199.
- ^ a b c d e f g h i Pressbook.
- ^ Internet Movie Database.
- ^ a b c d e f Library of Congress press release
- ^ Allmovie.
- ^ Marshall, 242.
- ^ Feaster, 109.
- ^ a b c d e f g h Briggs.
- ^ Schaefer, 106.
- ^ Schaefer, 200.
- ^ a b c Turan, 22,
- ^ Schaefer, 116.
- ^ a b Schaefer, 133.
- ^ a b Mondor, personal letter.
- ^ Friedman, 119.
- ^ a b c d McDougal.
- ^ Schaefer, 128.
- ^ Variety.
- ^ Schaefer, 197.
- ^ Schaefer, 136â ^164.
- ^ Schaefer, 329.
- ^ Schaefer, 202.
- ^ Feaster, 110.
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"Kroger Babb's Roadshow." Reason, November 2003.
[edit] External links

Coordinates: 53°26′N 2°18′W﻿ / ﻿53.433°N 2.3°W﻿ / 53.433; -2.3

Metropolitan Borough of Trafford

~ Metropolitan borough ~

Trafford Town Hall, in Stretford

Motto: "Hold Fast That Which Is Good"

Trafford shown within England

Coordinates: 53°26′46″N 2°18′29″W﻿ / ﻿53.44611°N 2.30806°W﻿ / 53.44611; -2.3

Sovereign state

United Kingdom

Constituent country

England

Region

North West England

Ceremonial county

Greater Manchester

Admin HQ

Stretford

Founded

1 April 1974

Government

• Type

Metropolitan borough

• Governing body

Trafford Metropolitan Borough Council

• Mayor

Cllr. Jane Baugh

• MPs:

Graham Brady (C)Paul Goggins (L)Kate Green (L)

Area

• Total

40.94 sq mi (106.04 km²)

Elevation

100 ft (30 m)

Population (2011 est.)

• Total

227,100 (Ranked 68th)

• Density

5,170/sq mi (1,997/km²)

• Ethnicity(2011 data)[1]

80.41% White British

2.25% White Irishn

0.18% Gypsy or Irish Traveller

2.87% Other White

1.17% White and Black Caribbean

0.29% White and Black African

0.68% White and Asian

0.52% Other mixed

2.75% Indian

3.10% Pakistani

0.20% Bangladeshi

0.98% Chinese

0.86% Other Asian

0.79% Black African

1.67% Black Caribbean

0.41% Other Black

0.55% Arab

0.41% Other ethnicity
Time zone
Greenwich Mean Time (UTC+0)
Postcode
M16, M17, M31, M32, M33, M41, WAl3, WAl4, WAl5
Area code(s)
0161
ISO 3166-2
GB-TRF
ONS code
00BU (ONS)
E08000009 (GSS)
OS grid reference
SJ795945
NUTS 3
UKD31
Website
www.trafford.gov.uk

Trafford is a metropolitan borough of Greater Manchester, England. With an estimated population of about 211,800 in 2006,[2] it covers 41 square miles (106Â km2)[3] and includes the towns of Altrincham, Partington, Sale, Stretford, and Urmston. The borough was formed on 1 April 1974 by the Local Government Act 1972 as a merger of the municipal boroughs of Altrincham, Sale, and Stretford, the urban districts of Bowdon, Hale, and Urmston and part of Bucklow Rural District. All were previously in Cheshire, apart from Stretford and Urmston which were in Lancashire. The River Mersey flows through the borough, separating North Trafford from South Trafford. Historically the Mersey also acted as the boundary between the historic counties of Lancashire and Cheshire.

The Trafford area has a long heritage, with evidence of Neolithic, Bronze Age, and Roman activity. Amongst the relics of the past are two castlesÂ â ^ one of them a Scheduled Ancient MonumentÂ â ^ and over 200 listed buildings. The area underwent change in the late 19th century and the population rapidly expanded with the arrival of the railway. Trafford is the home of Manchester United F.C. and Lancashire County Cricket Club and since 2002 the Imperial War Museum North.

Trafford has a strong economy with low levels of unemployment and contains both Trafford Park industrial estate and the Trafford Centre, a large out-of-town shopping centre. Apart from the City of Manchester, Trafford is the only borough in Greater Manchester to be above the national average for weekly income. Socially, the area includes both working class areas like Old Trafford and Stretford and middle class ones such as Bowdon and Hale. Altrincham and Sale West is one of the two parliamentary constituencies in Greater Manchester to be held by the Conservative Party, the other being Bury North.

[edit] History

The choice of the name Trafford for the borough was a "compromise between Altrincham, Stretford and Sale", and "seemed to have wide support".[4] A Liberal councillor for the Municipal Borough of Sale suggested "CrossfordÂ ... whilst "Watlingford" was suggested by councillors in Hale, after the supposed name of an ancient Roman road in the district.[4] Those names were rejected in favour of Trafford, because of the district's "famous sports venue, a major employer as well as historic associations", referring to Old Trafford (cricket and football), Trafford Park and the de Trafford baronets respectively.[4]

As a place name, Trafford is an Anglo-French version of Stratford, deriving from the Old English words strÃ|t (a street, more specifically a Roman road) and ford (a river crossing). The Metropolitan Borough of Trafford has existed since 1974, but the area it covers has a long history. Neolithic arrowheads have been discovered in Altrincham and Sale,[5] and there is evidence of Bronze Age habitation in Timperley.[6] Fragments of Roman pottery have been found in Urmston, and Roman coins have been found in Sale. The Roman road between the legionary fortresses at Chester (Deva Victrix) and York (Eboracum) crosses

Trafford, passing through Stretford, Sale, and Altrincham.[7] The settlements in Trafford have been based largely around agriculture, although Altrincham was probably founded as a market town.[8] Although the Industrial Revolution affected Trafford, the area did not experience the same rate of growth as the rest of Greater Manchester.[9] A 100% increase in population in the Trafford area between 1841 and 1861 was a direct result of an influx due to the construction of the Manchester, South Junction and Altrincham Railway, which allowed residents to more easily commute from Trafford into Manchester.[9] The area developed its own centres of industry in Broadheath (founded in 1885) and Trafford Park (founded in 1897).[10] They have since declined, although Trafford Park still employs 40â ^50,000 people.[11][12] Today, Trafford is mostly a commuter area. The borough was formed on 1Â April 1974 by the Local Government Act 1972 as one of the ten metropolitan districts of Greater Manchester.[13]

[edit] Geography

The metropolitan boroughs of the City of Salford and the City of Manchester border Trafford to the north and east respectively; the Cheshire East area of Cheshire lies to the south. The geology of South Trafford is Keuper marl with some Keuper waterstone and sandstone, whilst the geology of North Trafford is Bunter sandstone.[14] The River Mersey runs east to west through the area, separating North Trafford from South Trafford; other rivers in Trafford include the Bollin, the River Irwell, Sinderland Brook, and Crofts Bank Brook. The Bridgewater Canal, opened in 1761 and completed in 1776, follows a course through Trafford roughly north to south and passes through Stretford, Sale, and Altrincham.[14] The Manchester Ship Canal, opened in 1894, forms part of Trafford's northern and western boundaries with Salford.[15]

Trafford is generally flat, with most of the land lying between 66 feet (20Â m) and 98 feet (30Â m) above sea level, apart from Bowdon Hill in South Trafford which rises 200 feet (60Â m) above sea level.[14] The lowest point in Trafford, near Warburton, is 36 feet (11Â m) above sea level.[16] There are areas of mossland in low lying areas: Warburton Moss, Dunham Moss, and Hale Moss.[14] Greenspace accounts for 51.8% of Trafford's total area, domestic buildings and gardens comprise 25.6%, the rest is made up of roads and non-domestic buildings.[17]

Localities within the boundaries of Trafford include:

North Trafford: Cornbrook, Davyhulme, Firswood, Flixton, Gorse Hill, Lostock, Old Trafford, Stretford, Trafford Park and Urmston.

South Trafford: Altrincham, Ashton-Upon-Mersey, Bowdon, Broadheath, Brooklands, Carrington, Dunham Massey, Hale, Hale Barns, Oldfield Brow, Partington, Sale, Sale Moor, Timperley, Warburton and West Timperley.

[edit] Governance

[edit] Westminster

The residents of Trafford Metropolitan Borough are represented in the British Parliament by Members of Parliament (MPs) for three separate parliamentary constituencies. Altrincham and Sale West is represented by Graham Brady MP (Conservative).[18] This is one of only a small number of seats in the North West held by the Conservative Party, and one of only two in Greater Manchester. Stretford and Urmston is represented by Kate Green MP (Labour).[19] Wythenshawe and Sale East, which also covers parts of the City of Manchester, is represented by Paul Goggins MP (Labour).[20]

[edit] European Parliament

Trafford is part of the North West England constituency in the European Parliament. North West England elects eight MEPs; as of the 2009 European elections, the region is represented made up of three Conservatives, two from the Labour Party, one Liberal Democrat, and one member of the United Kingdom Independence Party and one for the British National Party.[21]

[edit] Council

(See Trafford local elections)

In 1974, Trafford Council was created to administer the newly formed Trafford Metropolitan Borough and is headquartered at Trafford Town Hall, which was previously named Stretford Town Hall.[22] On its formation in 1974, the council

was controlled by the Conservative Party; the Conservatives have been in control 1973â ^85, 1988â ^94, and 2004 to the present. The only time the Labour Party was in control was 1996â ^2002. The rest of the time were periods of no overall control.[23] The council meets to decide policy and allocate budget. Its duties include setting levels of council tax, monitoring the health service in Trafford, providing social care, and funding schools.[24][25] Jane Baugh is Mayor of Trafford for 2011â ^12.[26]

In 2007 the Audit Commission judged Trafford Council to be "improving strongly" in providing services for local people. Overall the council was awarded "three star" status meaning it was "performing well" and "consistently above minimum requirements", similar to 46% of all local authorities.[27] In 2008â ^09, Trafford council had a budget of Â£150.5Â million. This was collected from council tax (57%) and government grants (43%). The council spent Â£31.8Â million on children and young people's services (21%); Â£60.1Â million on community services and social care (40%); Â£34.4Â million on "prosperity, planning, and development" (23%); and Â£33.8Â million on customer and corporate services (22%).[25]

Civil parishes form the bottom tier of local government; the parish councils are involved in planning, management of town and parish centres, and promoting tourism.[28] In 2001, 8,484 people (4.0% of the borough's population) lived in Trafford's four civil parishes:[29] Carrington, Dunham Massey, Partington, and Warburton. They were all previously part of Bucklow Rural District. A rural district was a type of local government district for the administration of predominantly rural areas. The rest of Trafford is unparished. The unparished areas are: Altrincham (Municipal Borough), Bowdon (Urban District), Hale (Urban District), Sale (Municipal Borough), Stretford (Municipal Borough), and Urmston (Urban District). The status of each area prior to 1974 is shown in brackets. An urban district was a type of local government district which covered an urbanised area.

Party political make-up of Trafford Council

Â Â

Party

Seats

Current Council (2012â ^14)

2007[30]

2008[31]

2010[32]

2011[33]

2012[34]

Â

Conservative

39

39

37

37

34

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Labour

20

19

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[edit] Electoral wards

There are 21 electoral wards in Trafford, each with 3 councillors, giving a total of 63 councillors with one-third elected three years out of four.[24] In the following table, the populations for each ward are based on 2006 population estimates.

Ward name

Localities covered (approximate)

Population

Ref.

Altrincham

Altrincham, Broadheath, and Oldfield Brow

9,570

[35]

Ashton upon Mersey

Ashton upon Mersey and Sale

9,519

[36]

Bowdon

Altrincham, Bowdon, Dunham Massey, and Warburton

8,806

[37]

Broadheath

Altrincham, Broadheath, Sale, Timperley, and West Timperley

10,601

[38]

Brooklands

Brooklands and Sale

9,773

[39]

Bucklow-St. Martins

Ashton upon Mersey, Carrington, and Partington

9,655

[40]

Clifford

Old Trafford

10,106

[41]

Davyhulme East

Davyhulme and Urmston

10,414

[42]

Davyhulme West

Davyhulme and Flixton

9,595

[43]

Flixton

Flixton

10,796

[44]

Gorse Hill

Gorse Hill and Stretford

10,306
[45]
Hale Barns
Hale, Hale Barns and Timperley
9,143
[46]
Hale Central
Altrincham and Hale
9,100
[47]
Longford
Firswood, Old Trafford, and Stretford
11,357
[48]
Priory
Sale
9,439
[49]
St. Mary's
Ashton upon Mersey and Sale
11,160
[50]
Sale Moor
Sale and Sale Moor
9,899
[51]
Stretford
Stretford
10,334
[52]
Timperley
Brooklands and Timperley
10,666
[53]
Urmston
Flixton and Urmston
10,159
[54]
Village
Brooklands and Timperley
9,747
[55]
Trafford
All
211,800

[edit] Coat of arms

The coat of arms of Trafford Council depicts a griffin on a shield flanked by two unicorns. The line bisecting the shield horizontally symbolises the River Mersey running through Trafford from east to west and the canals in the borough.[56] The white legs of a lion on a red background represent the parts of Trafford previously controlled by the De Massey family, while the red body and head of an eagle on a white background represents the areas of Trafford previously controlled by the De Traffords. Both elements were taken from the coats of arms of the respective families.[56] The fist holding bolts of lightning represents Stretford and the electrical industry; the cog on the arm represents Altrincham's engineering industry.[56] The unicorns stand for Sale and Altrincham.[56] The oak branches represent Urmston and the rural areas of Trafford.[56]

[edit] Demography

Trafford compared

2011 UK Census[57]

Trafford

Greater Manchester

England

Population

226,578

2,514,757

49,138,831

White

85.55%

91.2%

90.9%

Asian

7.92%

5.6%

4.6%

Black

3.42%

1.2%

2.3%

As of the 2001 UK census, the Metropolitan Borough of Trafford had a total population of 210,145.[57] Of the 89,313 households in the borough, 36.5% were married couples living together, 31.6% were one-person households, 7.8% were co-habiting couples and 9.7% were lone parents, following a similar trend to the rest of England.[58]

The population density was 1,982^Â /km² (5,130^Â /sq^Â mi)[3] and for every 100 females, there were 94.6 males. Of those aged 16^Â ^74 in Trafford, 24.7% had no academic qualifications, significantly lower than the 28.9% in all of England.[57] 8.2% of Trafford's residents were born outside the United Kingdom, lower than the English average of 9.2%.[59] The largest minority group was Asian, at 4.0% of the population.[60]

In 1841, 12% of Trafford's population was middle class compared to 14% in England and Wales; this increased to 21% in 1931 (15% nationally) and 55% in 2001 (48% nationally). From 1841 to 1951, the working class population of Trafford and across the country was in decline, falling steadily from 43% to 18% (36% to 29% nationally). It has since increased slightly, up to 27% (26% nation-wide). The rest of the population was made up of clerical workers and skilled manual workers.[61] As of the 2007/2008 financial year, the crime rates in Trafford for violence against a person and sexual offences were below the national averages. However, the rate of robberies were above the national average.[62]

[edit] Population change

The table below details the population change since 1801, including the percentage change since the last census 10 years earlier. Although Trafford was formed as a Metropolitan Borough in 1974, figures have been generated by combining data from the towns, villages, and civil parishes that would later be constituent parts of Trafford. The greatest percentage change in the population occurred between 1851 and 1871, and was a result of the construction of the Manchester, South Junction and Altrincham Railway in 1849.[9] The decrease by 7.7% in Trafford's population since the 1971 census mirrors the trend for Greater Manchester, although on a smaller scale; this has been accounted for by the decline of Greater Manchester's industries, particularly those in Manchester and Salford but including those in Trafford, and residents leaving to seek new jobs.[63]

Population growth in Trafford since 1801

Year

1801

1811

1821

1831

1841
1851
1861
1871
1881
1891
1901
1911
1921
1931
1941
1951
1961
1971
1981
1991
2001
Population
9,760
11,197
12,697
13,725
17,474
21,896
35,588
49,280
62,971
76,672
94,830
117,289
135,163
155,760
178,385
204,302
215,714
227,792
221,000
215,785
210,145
Â % change
â ^
+14.7
+13.4
+8.1
+27.3
+25.3
+62.5
+38.5
+27.8
+21.8
+23.7
+23.7
+15.2
+15.2
+14.5
+14.5
+5.6
+5.6
â ´3.0
â ´2.4

â 2.6

Source: A Vision of Britain through Time

[edit] Economy

Historically, the economy of the Trafford area has been dominated by agriculture. This continued to some extent even during the Industrial Revolution, as the textile industry in Trafford did not develop as quickly or to the same extent as it did in the rest of Greater Manchester.[64] There are only two known 18th-century mill sites in Trafford, compared with 69 known in Tameside and 51 in Manchester.[64] After reaching a high of 43% in 1812, employment in the textile industry in Trafford declined to 12% according to the 1851 census.[64] The textile industry in Trafford could not compete with that in places such as Manchester, Oldham, and Ashton-under-Lyne, partly because of a reluctance to invest in industry on the part of the two main land owners in the area: the Stamfords and the de Traffords.[64]

Trafford Park was founded in 1897, and at its peak in 1945 employed 75,000Â people.[65] As well as being the world's first planned industrial estate,[66] it is Europe's largest business park. More than 1,400Â companies are within the park, employing between 40,000 and 50,000Â people.[11][12][66] The Trafford Centre, which opened on 10 September 1998,[67] is North West England's largest indoor shopping complex. The centre has over 30Â million visitors annually,[68] and contains 235 stores, 55 restaurants, and the largest Odeon cinema in the UK.[69]

Trafford compared

2001 UK Census

Trafford[70]

Greater Manchester[71]

England

Population of working age

151,445

1,805,315

35,532,091

Full-time employment

43.4%

40.3%

40.8%

Part-time employment

11.9%

11.3%

11.8%

Self-employed

8.0%

6.7%

8.3%

Unemployed

2.7%

3.5%

3.3%

Retired

13.9%

13.0%

13.5%

Trafford is a prosperous area, with an average weekly income of Â£394, and apart from Manchester it is the only borough in Greater Manchester to be above the national average for weekly income and is on average the highest in the county. Media, advertising and public relations have been identified as growth industries in Greater Manchester and are concentrated in Manchester and Trafford.[72] Average house prices in Trafford are the highest out of all the metropolitan boroughs in Greater Manchester, 45% higher than the average for the county.[73]

As of the 2001 UK census, Trafford had 151,445 residents aged 16 to 74. 2.5%

of these people were students with jobs, 5.7% looking after home or family, 5.4% permanently sick or disabled and 2.8% economically inactive for other reasons. Trafford has a low rate of unemployment (2.7%) compared with Greater Manchester (3.6%) and England as a whole (3.3%).[70] Trafford has the lowest number of unemployment benefit claimants compared to all the other boroughs in Greater Manchester (3.7%).[74]

In 2001, of 99,146 residents of Trafford in employment, the industry of employment was 17.1% property and business services, 16.5% retail and wholesale, 12.3% manufacturing, 11.9% health and social work, 8.2% education, 8.0% transport and communications, 5.9% construction, 5.5% finance, 4.5% public administration and defence, 4.0% hotels and restaurants, 0.8% energy and water supply, 0.6% agriculture, and 4.6% other. This was roughly in line with national figures, except for the proportion of jobs in agriculture which is less than half the national average, reflecting Trafford's suburban nature and its proximity to the centre of Manchester.[75]

A study commissioned by Experian rated Trafford as the strongest and most resilient borough in North West England to dealing with sudden changes in the economy. Trafford's low reliance on vulnerable businesses in the current recession and its high proportion of multinational companies were two factors which give the borough its high ranking.[76]

[edit] Culture

[edit] Landmarks

As of March 2007, Trafford has 6 Grade I, 11 Grade II*, and 228 Grade II listed buildings. Trafford has the equal second highest number of Grade I listed buildings out of the districts of Greater Manchester behind Manchester.[77][78] Most of Trafford's Grade I listed buildings are in the south of the borough: the old Church of St. Werburgh in Warburton; Dunham Massey Hall itself, and the stables and carriage house belonging to the hall; Royd House in Hale; and the Church of All Saints in Urmston in the north of the borough.[78] Trafford has three of Greater Manchester's 21 Sites of Special Scientific Interest. Brookheys Covert is a semi-natural wood consisting mainly of ash, birch, and rowan, with a wetland habitat covering 5.8 acres (2.3Â ha) in Dunham Massey.[79]Cotteril Clough is an area of woodland that is among the most diverse in Greater Manchester.[80]Dunham Park is an area of "pasture-woodland or park-woodland" and has been since the Middle Ages, including many oak trees that date back to the 17th century, and covers 192.7 acres (78.0Â ha).[81] Also in Trafford are many parks and open spaces; there are 21.2 square miles (55Â km2) of greenspace, 51.8% of the total area covered by the borough.[17] Tourist attractions in Trafford include Old Trafford football ground and Old Trafford Cricket Ground.

Chill Factore is an indoor ski slope in Trafford Park. It features the UK's longest and widest real snow indoor slope, 100 metres (110Â yd) wide and 180 metres (200Â yd) long.[82]

Dunham Massey Hall and Park is an 18th-century hall[83] with a 250-acre (1.0Â km2) deer park, both now owned by the National Trust and previously owned by the Earls of Stamford. The hall is early Georgian in style. The hall and grounds are open to the public and are a popular tourist attraction, with nearly 200,000Â visitors in 2010.[84][85]

Imperial War Museum North is a war museum in Trafford Park and was opened in 2002. The museum won the 2003 British Construction Industry Building Award, and the title of Large Visitor Attraction of the Year at the 2006 Manchester Tourism Awards.[86]

Sale Water Park is a 152-acre (62Â ha) area of countryside and parkland including a 52-acre (21Â ha) artificial lake created when the M60 motorway was built.[87] The water park is the site of the Broad Ees Dole wildlife refuge, a Local Nature Reserve that provides a home for migratory birds.[88]

Timperley Old Hall is a medieval moated site in Timperley near Altrincham Municipal Golf Course. Excavation on the site over a period of 18 years has shown Timperley to be inhabited since the Bronze Age. A grant from the Heritage Lottery Fund has been made to develop the site into a community project.[6]

Trafford has two medieval castles. Dunham Castle is an early medieval castle in Dunham Massey. It belonged to Hamon de Massey, and was probably still standing in the early 14th century. The bailey was landscaped into the grounds of Dunham Massey Hall and its moat turned into an ornamental pond.[89] Watch Hill Castle is an early medieval motte-and-bailey castle on the border of Dunham Massey and Bowdon. It is listed as a Scheduled Ancient Monument. The motte and surrounding ditch still survives, although it had fallen out of use by the 13th century.[90]

Trafford is the home of several major sports teams, including Manchester United Football Club and Lancashire County Cricket Club (LCCC). Manchester United began as Newton Heath L&Y F.C. in 1878.[91] The team plays at Old Trafford football ground, which is sometimes used as a stadium for international matches. Manchester United have won the FA Cup 11 times and been the Premier League champions 12 times (since the league was formed 18 seasons ago) and were Football League champions seven times in the years prior to that. The club last won the Premier League in 2011.[92] LCCC started as the Manchester Cricket Club,[93] and represents the historic county of Lancashire. The club contested the original 1890 County Championship.[94] Old Trafford Cricket Ground is Lancashire's home ground and stages international matches, including Test matches and One Day Internationals.[95] The team has won the county championship eight times outright (with one shared) and are the current county champions after winning the competition in 2011 - the county's first outright triumph since 1934.

Also in the top division of their sports are Sale Sharks, who play rugby union. From 2009, Manchester Phoenix, who play home games at the Altrincham Ice Dome, are members of the English Premier Ice Hockey League. The club was formed in 2003 as the successor to Manchester Storm and was one of the founder members of the Elite Ice Hockey League.[96][97] In 2008-09 they finished sixth in the Elite Ice Hockey League. The Trafford Metros are the Phoenix's junior side and are also based at the Altrincham Ice Dome.[98] Rugby Union side Sale Sharks were formerly based in Trafford and although they now play at Edgeley Park in Stockport, they retain their name from when they were based at Heywood Road in Sale; their former home-ground Road is still used as the team's training ground.[99] Sale Sharks won the Guinness Premiership in 2006; in 2008-09 they finished fifth.

As well as being home to several clubs in the top echelon of their sports, Trafford plays host to smaller clubs, including Altrincham F.C., Flixton F.C., and Trafford F.C.. Both Flixton F.C. and Trafford F.C. play in the North West Counties Football League Division One. Flixton F.C. was formed in 1960 and earned promotion to NWCF Division One at the end of the 2006-07 season. Trafford F.C. was formed in 1990 and finished fifth in the 2006-07 season.[100] Altrincham F.C. was founded in 1903 and plays in the Football Conference.

Within Trafford two clubs play in the National Premier Division of the Adidas England Hockey League. The two clubs are represented in both the Men's Premier Division as well as the Women's Premier Division: Brooklands MU (Men) and Brooklands Poynton (Women) based at Brooklands Sports Club in Sale[101] and Bowdon (Men) and Bowdon Hightown (Women) based at Bowdon Sports Club in Bowdon.[102]

[edit] Education

There are 73 primary schools in Trafford, 17 secondary and grammar schools, and 6 special schools.[103] Trafford maintains a selective education system, with grammar schools, assessed by the Eleven Plus exam. Trafford College, a £29M "super college" in Stretford, is the only college of further education in Trafford. It was officially opened in 2008, following a merger between South Trafford College and North Trafford College.[104] Overall, Trafford was ranked 3rd out of all of the Local Education Authorities in National Curriculum assessment performance in 2007.[105] Absences from Trafford secondary schools in 2006-07, authorised and unauthorised, were 5.6% and 0.8% respectively, both lower than the national average (6.4% and 1.4%).[106] From the 2007 GCSE results, the Trafford LEA was ranked 5th out of 148 in the country and first

in Greater Manchester and the North West[^] based on the percentage of pupils attaining at least 5 A*[^]C grades at GCSE including maths and English (60.8% compared with the national average of 46.7%).^[107]

From the 2007 GCSE results and A-level results, Altrincham Grammar School for Girls was the most successful secondary school in Trafford, with 100% of pupils gaining five or more GCSEs at A*[^]C grade including maths and English. At A-level, Altrincham Grammar Schools for Girls was the 39th most successful school in the country.^{[108][109]} St. Ambrose College is undergoing a [^]£17M rebuild of the school on the current school grounds in Hale Barns.^[110]

[edit] Religion

Religion in Trafford

2001 UK Census^[57]

Trafford

North West England

England

Population

210,145

6,729,764

49,138,831

Christian

75.8%

78.0%

71.7%

Muslim

3.3%

3.0%

3.1%

Jewish

1.1%

0.4%

0.5%

No religion

12.0%

10.5%

14.6%

As of the 2001 UK census, 75.8% of Trafford's residents reported themselves as being Christian, 3.3% Muslim, 1.1% Jewish, 0.6% Hindu, 0.2% Buddhist and 0.5% Sikh. The census recorded 12.0% as having no religion, 0.2% had an alternative religion and 6.4% did not state their religion.^[57] Trafford is covered by the Catholic Dioceses of Shrewsbury and Salford,^{[111][112]} and the Church of England Dioceses of Manchester and Chester.^{[113][114]}

There are two Grade I listed churches in Trafford: St. Werburgh's Church, in Warburton, is a timber framed church and dates back to at least the 14th century;^[115] All Saints' Church, in Urmston, was constructed in 1868 by E. W. Pugin, and is considered to be one of his best works.^[116] Of the 11 Grade II* listed buildings in Trafford, seven are churches: Hale Chapel in Hale; the Church of St John the Divine in Sale; Church of St Mary the Virgin in Bowdon; St. Martin's Church in Sale; St. Michael's Church in Flixton; St. Margaret's Church in Altrincham; St. George's Church in Carrington.^[78]

In 2007, the Church of Scientology bought the Old Trafford Essence Distillery on Chester Road for a reported [^]£3.6M. The Church stated that it had plans to turn the 51,000-square-foot (4,700[^]m²) Victorian building into a place of worship and religious instruction. The original plans were rejected by Trafford Council, but the Church stated its intention to revise the proposals and resubmit.^[117]

[edit] Transport

The Manchester Metrolink runs generally north[^] south through Trafford, with its southern terminus in Altrincham; it serves Cornbrook, Trafford Bar, Old Trafford, Stretford, Dane Road, Sale, Brooklands, Timperley, Navigation Road, and Altrincham. The line opened in 1992 and replaced the Manchester, South

Junction and Altrincham Railway.[118] The other railways in Trafford are the Liverpool and Manchester Railway and the Cheshire Lines Committee. The 20-acre (8Â ha) Trafford Park Euroterminal rail freight terminal was opened in 1993. It cost Â£11Â million and has the capacity to deal with 100,000 containers a year.[119]

The council is responsible for the maintenance of Trafford's public roads and pavements.[120][121] Part of the M60 orbital motorway passes through Trafford, from junctions 6â ^10 inclusive.

A range of bus services provide connections between various towns in the borough and links to the city centre, and other urban areas of Greater Manchester and Cheshire. Operators include Stagecoach Manchester, Arriva North West, Finglands as well as smaller operators, who generally run services under contract to GMPTE. Trafford Cycle Forum was established to promote cycling in Trafford;[122] the group actively campaigns to raise money for cycling in the borough.[123]

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[edit] Bibliography
 [edit] External links
 [edit] Video clips

William de Corbeil or William of Corbeil (French: Guillaume de Corbeil) (circa 1070–1136) was a medieval Archbishop of Canterbury. Very little is known of William's early life or his family, except that he was born at Corbeil in the outskirts of Paris and that he had two brothers. Educated as a theologian, he taught briefly before serving the bishops of Durham and London as a clerk and subsequently becoming a canon, a priest who lived a communal life. William was elected to the see of Canterbury as a compromise candidate in 1123, the first canon to become an English archbishop. He succeeded Ralph d'Escures, who had employed him as a chaplain.

Throughout his archbishopric, William was embroiled in a dispute with Thurstan, the Archbishop of York, over the primacy of Canterbury. As a temporary solution, the pope appointed William the papal legate for England, giving him powers superior to those of York. William concerned himself with the morals of the clergy, and presided over three legatine councils, which among other things condemned the purchase of benefices or priesthoods, and admonished the clergy to live a celibate life. He was also known as a builder; among his

constructions is the keep of Rochester Castle. Towards the end of his life William was instrumental in the selection of Count Stephen of Boulogne as King of England, despite his oath to the dying King Henry I that he would support the succession of his daughter, the Empress Matilda. Although some chroniclers considered him a perjurer and a traitor for crowning Stephen, none doubted his piety.

[edit] Early life

William de Corbeil was probably born at Corbeil on the Seine, possibly in about 1070.[1] He was educated at Laon,[2] where he studied under Anselm of Laon, the noted scholastic and teacher of theology.[3] William taught for a time at Laon,[2] but nothing else is known of his early life.[4] All that is known of his parents or ancestry is that he had two brothers, Ranulf and Helgot;[1] his brothers appear as witnesses on William's charters.[5]

William joined the service of Ranulf Flambard, Bishop of Durham, as a clerk, and was present at the translation of the body of Saint Cuthbert in 1104.[1] His name appears high in a list of those who were present at the event, implying that he may have held an important position in Flambard's household, but appended to his name is "subsequently archbishop", suggesting that his inclusion could have been a later interpolation. He was a teacher to Flambard's children, probably in about 1107 to 1109,[6] but at some unknown date William appears to have transferred to the household of the Archbishop of Canterbury. Between 1107 and 1112 he went to Laon and attended lectures given by Anselm of Laon.[1] By 1116 he was a clerk for Ralph d'Escures, Archbishop of Canterbury, with whom he travelled to Rome in 1117 when Ralph was in dispute with Thurstan, the Archbishop of York, over the primacy of Canterbury.[7]

In 1118, William entered the Augustinian order at Holy Trinity Priory in Aldgate,[1] a house of canons rather than monks.[8] Subsequently he became prior of the Augustinian priory at St Osyth in Essex,[9][10] appointed by Richard de Beaumis, Bishop of London, in 1121.[1]

[edit] Election as archbishop

After the death of Ralph d'Escures in October 1122, King Henry I decided to allow a free election, with the new primate to be chosen by the leading men of the realm, both ecclesiastical and secular.[11][a] The monks of the cathedral chapter and the bishops of the kingdom disagreed on who should be appointed. The bishops insisted that it should not be a clerk (a non-monastic member of the clergy), but Canterbury's monastic cathedral chapter preferred a monk, and insisted that they alone had the right to elect the archbishop. However, only two bishops in England or Normandy were monks (Ernulf, Bishop of Rochester, and Serlo, Bishop of S  ez), and no monks other than Anselm of Canterbury, Ernulf, and Ralph d'Escures, had been elected to an English or Norman see since 1091; recent precedent therefore favoured a clerk.[7] King Henry sided with the bishops, and told the monks that they could elect their choice from a short list selected by the bishops. Perhaps unsurprisingly, the list contained no monks.[12]

On 2 February[13] or 4 February 1123,[14] William was chosen from among four candidates to the see of Canterbury; the names of the three unsuccessful candidates are unknown.[7] He appears to have been a compromise candidate, as he was at least a canon, if not the monk that the chapter had sought.[15] William was the first Augustinian canon to become an archbishop in England, a striking break with the tradition that had favoured monks in the see of Canterbury.[16] Although most contemporaries would not have considered there to be much of a distinction between monks and canons, William's election still occasioned some trepidation among the monks of the Canterbury chapter, who were "alarmed at the appointment, since he was a clerk".[17]

[edit] Primacy dispute

William, like every other Canterbury archbishop since Lanfranc, maintained that Canterbury held primacyâin essence, overlordshipâover all other dioceses in Great Britain, including the archbishopric of York.[12] Thurstan had claimed independence,[18] and refused to consecrate William when the latter demanded recognition of Canterbury's primacy; the ceremony was performed instead by

William's own suffragan bishops on 18th February 1123.[12][14] Previous popes had generally favoured York's side of the dispute, and the successive popes Paschal II, Gelasius II, and Calixtus II had issued rulings in the late 1110s and early 1120s siding with York. Calixtus had also consecrated Thurstan when both King Henry and William's predecessor had attempted to prevent Thurstan's consecration unless Thurstan submitted to Canterbury.[19]

After travelling to Rome to receive his pallium, the symbol of his authority as an archbishop, William discovered that Thurstan had arrived before him, and had presented a case against William's election to Pope Callixtus II.[1] There were four objections to William's election: first that he was elected in the king's court; second that the chapter of Canterbury had been coerced and was unwilling; third that his consecration was unlawful because it was not performed by Thurstan; and fourth that a monk should be elected to the see of Canterbury, which had been founded by Augustine of Canterbury, a monk.[7] However, King Henry I and the Emperor Henry IV, Henry I's son-in-law, persuaded the pope to overlook the irregularities of the election, with the proviso that William swore to obey "all things that the Pope imposed upon him." [12][20] At the conclusion of the visit the pope denied the primacy of Canterbury over York, dismissing the Canterbury cathedral chapter's supposed papal documents as forgeries.[7] The outcome was in accordance with most earlier papal rulings on the primacy issue, which involved not taking sides and thus reinforcing papal supremacy. William returned to England, and was enthroned at Canterbury on 22nd July 1123.[1]

The archbishop's next opponent was the papal legate of the new Pope Honorius II, Cardinal John of Crema,[20] who arrived in England in 1125. A compromise between York and Canterbury was negotiated, which involved Canterbury allowing York the supervision of the dioceses of Bangor, Chester, and St Asaph in return for Thurstan's verbal submission and the written submission of his successors. The pope, however, rejected the agreement, likely because he wished to preserve his own primacy, and substituted his own.[1] The papal solution was that Honorius would appoint William papal legate in England and Scotland, which was done in 1126,[21] giving William the position over York, but it was dependent on the will of the pope, and would lapse on the pope's death. The arrangement merely postponed the problem however, as neither Thurstan nor William renounced their claims. That Christmas, at a royal court, Thurstan unsuccessfully attempted to claim the right to ceremonially crown the king as well as have his episcopal cross carried before him in Canterbury's province.[1] As a result of his lengthy dispute with Thurstan, William travelled to Rome more frequently than any bishop before him except for Wilfrid in the 7th century.[22]

[edit] Archiepiscopal activities

Legatine councils in 1125, 1127 and 1129 were held in Westminster, the last two called by Archbishop William.[1] The council of 1125 met under the direction of John of Crema and prohibited simony, purchase of the sacraments, and the inheritance of clerical benefices.[23] John of Crema had been sent to England not only to seek a compromise in the Canterbury-York dispute, but to publicize the decrees of the First Council of the Lateran held in 1123, which neither William nor Thurstan had attended. Included in canons were the rejection of hereditary claims to a benefice or prebend, which was a source of consternation to the clergy. Also prohibited was the presence of any women in clergy's households unless they were relatives.[1] In 1127 the council condemned the purchase of benefices, priesthoods, or places in monastic houses.[24] It also enacted canons declaring that clergy who refused to give up their wives or concubines would be deprived of their benefices, and that any such women who did not leave the parish where they had been could be expelled and even forced into slavery.[1] Lastly, in 1129 the clergy were once more admonished to live a celibate life and to put aside their wives.[23] This council was presided over by King Henry, who then undermined the force of the prohibition of concubines by permitting the clergy to pay a fine to the royal treasury in order to keep their women. William's allowance of this royal fine was condemned by the chronicler Henry of Huntingdon.[1] The festival of the

Conception was also allowed at one of these councils.[24]

As well as the councils, William was active in his diocese, and was interested in reforming the churches in his diocese. A conflict with Alexander of Lincoln over a church in Alexander's diocese led to further condemnation by Henry of Huntingdon[1] and prompted Henry to write that "no one can sing [William's] praises because there's nothing to sing about." [25] William seems to have been somewhat eclipsed in ecclesiastical administration and appointments by Roger of Salisbury, Bishop of Salisbury, and King Henry's primary advisor.[26] William reformed the nunnery of Minster-in-Sheppey however, and he installed a college of regular canons at the church of St. Gregory's, in Canterbury. He also secured a profession of obedience from the newly installed abbot of St Augustine's Abbey in Canterbury.[1] His legateship from Honorius lapsed when the pope died in February 1130, but it was renewed by Honorius' successor Pope Innocent II in 1132.[13]

During William's last years he attempted to reform St Martin's, Dover. The king had granted the church to the archbishop and the diocese of Canterbury in 1130, and William had a new church building constructed near Dover. The archbishop had planned to install canons regular into the church, and on William's deathbed dispatched a party of canons from Merton Priory to take over St Martin's. However, the party of canons, who had been accompanied by two bishops and some other clergy, were prevented from entering by a monk of Canterbury Cathedral, who claimed that St Martin's belonged to the monks of the cathedral chapter. The canons from Merton did not press the issue in the face of the Canterbury chapter's appeal to Rome, and after William's death, the cathedral chapter sent 12 monks to St Martin's instead.[1]

The construction of the keep of Rochester Castle~at 115 feet (35 m), the tallest Norman-built keep in England~was initiated at William's orders.[27] Built for King Henry, it is still intact, although it no longer has a roof or floors. The work at Rochester was built within the stone curtain walls that Gundulf of Rochester had erected in the late 11th century. The keep was designed not only for defence but also to provide comfortable living quarters, which were probably intended for use by the archbishops when they visited Rochester.[28] In 1127, the custody of Rochester Castle was granted to William and his successors as archbishop by King Henry, including the right to fortify the place as the archbishops wished, and the right to garrison the castle with their own men.[29] In the view of the historian Judith Green, the grant of the castle was partly to secure the loyalty of the archbishop to the king, and partly to help secure the defences of the coast.[30] William also completed the construction of Canterbury Cathedral, which was dedicated in May 1130.[1]

[edit] Final years

The archbishop swore to Henry I that he would support Henry's daughter Matilda's claim to the English throne,[21] but after Henry's death he instead crowned Stephen, on 22 December 1135. He was persuaded to do so by Henry of Blois, Bishop of Winchester and Stephen's brother,[31][32] and Roger of Salisbury, Bishop of Salisbury. The bishops argued that Henry had no right to impose the oath, and that the dying king had released the barons and the bishops from the oath in any event. The royal steward, Hugh Bigod, swore that he had been present at the king's deathbed and had heard the king say that he released the oath.[33]

William did not long outlive Henry, dying at Canterbury on 21 November 1136.[14] He was buried in the north transept of Canterbury Cathedral.[1] Contemporaries were grudging in their praise, and William's reputation suffered after the accession of Matilda's son, Henry II, to the English throne. William of Malmesbury said that William was a courteous and sober man, with little of the flamboyant lifestyle of the more "modern" bishops. The author of the Gesta Stephani claimed that William was avaricious and hoarded money. None of the chroniclers, however, doubted his piety, even when they named him a perjurer and a traitor for his coronation of Stephen.[1]

^ This would have included the barons and earls as well as the leading royal

servants on the secular side, and the bishops and some of the abbots on the ecclesiastical side.[1]

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[edit] External links

Persondata

Name

Corbeil, William de

Alternative names

William of Corbeil

Short description

Prior of St. Osyth; Archbishop of Canterbury

Date of birth

ca. 1070

Place of birth

Date of death

21 November 1136

Place of death

Canterbury

Californication is the seventh studio album by American rock band Red Hot Chili Peppers. It was released on JuneÂ 8, 1999, on Warner Bros. Records and was produced by Rick Rubin. Californication marked the return of John Frusciante,

who had previously appeared on Mother's Milk and Blood Sugar Sex Magik, to replace Dave Navarro as the band's guitarist. Frusciante's return was credited with changing the band's sound altogether, producing a notable shift in style from the music recorded with Navarro. The album's subject material incorporated various sexual innuendos commonly associated with the band, but also contained more varied themes than previous outings, including lust, death, contemplations of suicide, California, drugs, globalization, and travel.

Californication is the Chili Peppers' most commercially successful studio release, with over 16 million copies sold worldwide,[1] and more than 5 million in the United States alone.[2] As of 2002, the album had sold over 4 million copies in Europe.[3] The record produced several hits for the band, including "Otherside", "Californication" and the Grammy Award-winning "Scar Tissue". Californication peaked at number three on the U.S. Billboard 200. The record marked a significant change in style for the band: Rolling Stone's Greg Tate noted that "while all previous Chili Peppers projects have been highly spirited, Californication dares to be spiritual and epiphanic".[4]

[edit] Background

Guitarist John Frusciante left the band in the middle of a 1992 tour that promoted their critically acclaimed album Blood Sugar Sex Magik.[5] It took over a year for the band to find a new guitarist with whom to record officially. Dave Navarro, formerly of Jane's Addiction, was invited to join the Chili Peppers after Arik Marshall, who had finished the remaining tour dates for Blood Sugar Sex Magik, was fired.[6] Navarro influenced the band's ensuing album, One Hot Minute, by incorporating various elements of heavy metal and psychedelic rock,[7] which was something that the Chili Peppers had not previously been notable for. One Hot Minute was a commercial success, selling roughly five million copies (although a let down compared to Blood Sugar Sex Magik).[8] Critics, however, dismissed the album, claiming it was weak and unfocused.[7][9] Shortly after the release of One Hot Minute, Navarro was fired due to internal differences.[10]

In the years following Frusciante's departure from the Chili Peppers, he had developed a vicious addiction to both heroin and cocaine that left him in poverty and near death.[11] Friends convinced him to enter drug rehabilitation in January 1998.[12] In April 1998, following Frusciante's three month completion, Flea visited his former band-mate and openly invited him to re-join the band, an invitation Frusciante readily accepted. Within the week, and for the first time in six years, the foursome gathered to play and jump-started the newly reunited Red Hot Chili Peppers.[13]

[edit] Writing and composition

Much of the album was written in the band members' homes in the summer of 1998. Kiedis and Frusciante often spent days together discussing song creation, guitar riffs and lyrical content. Bass and percussion aspects of the record were constructed through jam sessions and the individual work of Flea and Smith.[14]

Californication's lyrics were derived from Anthony Kiedis' ideas, outlooks, and perceptions of life and its meaning. "Porcelain" resulted from Kiedis's meeting with a young mother at the YMCA, who was attempting to battle her alcohol addiction while living with her infant daughter.[15] Sarcasm was a concept that Kiedis had dealt with in the past, and he ultimately crafted a song around it. He was inspired by former band-mate Dave Navarro, whom he considered to be the "King of Sarcasm".[16] Frusciante approached the guitar line present in "Scar Tissue" as an attempt to use two notes that are played far apart, but produce a "cool rhythm".[17] He had explored this technique on his first solo album, 1994's Niandra Lades and Usually Just a T-Shirt. Frusciante considers "Scar Tissue" to be a "very simple example of the technique, but I think it's a style that sounds like me". The guitarist made use of slide guitar-playing for the solos in the song.[17] The song Emit Remmus, which is summer time spelled backwards, was inspired by Anthony's brief relationship with Melanie C of the Spice Girls.[18]

"Get On Top", a song which contains significant use of a wah pedal, was formed

after a jam session conducted shortly after Frusciante had listened to Public Enemy: "I came up with [the rhythm to the song] on the way to rehearsalâ ~just tapping it out with my foot." [17] The understated guitar solo played in the middle of the song was originally intended to be more noticeable, according to Frusciante, who was playing screaming guitar solos. He changed his thought process after listening to Steve Howe's guitar solo on Yes' "Siberian Khatru": "the band sounded really bigâ ~and they're playing really fastâ ~and then this clean guitar solo comes out over on top. It's really beautiful, like it's on its own sort of shelf. For 'Get On Top' I wanted to play something that contrasted between the solo and the background." [17] "Savior", a song found towards the end of the album, features heavy effects, most notably an Electro-Harmonix Micro Synth with 16-second delay. [17] Frusciante notes that the sound is "directly inspired by Eric Clapton's playing in Cream. If you listen to the actual notes, they're like a Clapton soloâ ~they just don't sound like it because of the effects." [17]

The hit "Around the World", which harkens back to the Chili Peppers' funk-influenced sound, was constructed by Frusciante at his home. The rhythm and beat, however, are intricate; this required him to play the song with the rest of the band rather than alone for them to understand it. [17] The bass lick was composed in "maybe 15 minutes," according to Frusciante: "Flea is the best bass player in the world. His sense of timing and the way he thinks is so crazy." [17] The title track of the album was among the most difficult for the band to complete. Frusciante felt compelled to write an appropriate guitar ensemble that would appropriately complement the poignant lyrical content, but encountered difficulty. [19] The song was barely making progress, and would have been scrapped had it not been for Kiedis' urgency to include it on the album. Frusciante completed the final riff two days before recording, after drawing inspiration from The Cure's soundtrack song to "Carnage Visors". [17][19] The title track was intended to represent Californian lifestyles and, more specifically, the "fake" nature which is associated with much of Hollywood. It references Kurt Cobain of Nirvana and uses considerable imagery to capture the evocative nature of California. [19]

The record was a change of style for the Chili Peppers, especially compared to their previous album, *One Hot Minute*, which combined various elements of heavy metal and psychedelic rock. Although *Californication* still contains some funk rock songs (such as "Around the World", "Get on Top", "I Like Dirt", "Purple Stain" and "Right on Time"), it leaned towards more melodic riffs (for example, "Scar Tissue" and "Otherside") and focused on songs with implemented structure rather than jams. [20]

[edit] Promotion and release

Rick Rubin had produced their two previous albums. However, the Chili Peppers decided to look for other producers for *Californication*. [21] David Bowie had shown great interest in working with the band and asked to produce the album; however, the Chili Peppers chose to remain with Rubin for *Californication*. [21] Rubin had, in the past, granted the Chili Peppers creative freedom on their recording material; this was something they thought necessary for the album to be unique, and could only occur with his return. [22] Recording took place at Cello Studios in Los Angeles. In early 1999, following the recording process, the band played "Scar Tissue", "Otherside", and "Californication" to their managers, and it was decided that "Scar Tissue" would be the lead single for the album. [23] To support their reunited line-up, the band played various proms across the country to promote *Californication*. [23] It sprouted a competition, which called upon high school students to write essays on "how they could make their schools better, safer, happier, more rocking places, so that they didn't have to go to school afraid. If you wrote the essay, you got a free ticket to the show." [23]

Californication was released on June 8, 1999, debuting at #5 but peaking at #3 on the *Billboard* 200 chart. In Europe, the album peaked at #5 on the UK Top 40, #1 on the Finnish, Austrian, Swedish and New Zealand charts, and #2 on the French Top 40. It was certified gold just over a month later, on July 22, 1999,

and its continuing sales have resulted in it being certified five-times platinum.[24][25] In March 2006, the Red Hot Chili Peppers' albums were made available to purchase on the iTunes Music Store.[26] Albums bought there included new previously unreleased tracks ("Fat Dance", "Over Funk", and "Quixoticelixer"). In Germany, it was the band's best-selling album, staying on the Media Control Charts for 114 weeks (more than 2 years) and selling more than 750,000 copies, reaching 3Ã Gold.[27]

[edit] Critical reception and legacy

Californication received favorable reviews in contrast to its less popular predecessor, One Hot Minute, and it was a greater success worldwide.[28]Rolling Stone credited Kiedis for his drastically improved vocals: "[his] vocal cords have apparently been down to some crossroads and over the rehab, and returned with heretofore unheard-of range, body, pitch, soulfulness, and melodic sensibility." [4] Songs such as "Otherside" and "Porcelain" were called "Pumpkins-esque", while the album as a whole was "epiphanal" and the "RHCP furthermuckers are now moving toward funk's real Holy Grail: that salty marriage of esoteric mythology and insatiable musicality that salvages souls, binds communities and heals the sick." [4] Other critics credited the album's success to the return of Frusciante. Allmusic's Greg Prato said that the "obvious reason for [the band's] rebirth is the reappearance of guitarist John Frusciante", considering him to be the "quintessential RHCP guitarist".[28] The album as a whole was "a bona fide Chili Peppers classic".[28]Entertainment Weekly also credits Frusciante with transforming the band's sound into a "more relaxed, less grating, and, in their own way, more introspective album than ever before".[20] Mark Woodlief of Ray Gun commented that "'This Velvet Glove' strikes an intricate balance between a lush acoustic guitar foundation and anthemic rock," Woodlief continued "the disco intro to 'Parallel Universe' gives way to a scorching Western giddy-up motif in the chorus, and Frusciante's Hendrix-like excursions at the song's close." [34]

While many critics found the band's new sound refreshing, NME criticized the Chili Peppers for rarely using their trademark funk sound, asking: "Can we have our brain-dead, half-dressed funk-hop rock animals back now, please? All this false empathy is starting to make my removed rib tingle." [35]Pitchfork, while considering the album a triumph over One Hot Minute, felt Californication lacked the funk that was ever-present in Blood Sugar Sex Magik.[32] It went on to scrutinize some lyrics for being overly sexual, but also considered Frusciante to be "the best big-time American rock guitarist going right now".[32]

Over the years, Californication has maintained its popularity. "Scar Tissue" won the Grammy Award for Best Rock Song in 2000.[36] The album was ranked number 399 on Rolling Stone magazine's 2003 list of "The 500 Greatest Albums of All Time" and, in 2006, the Chili Peppers recorded a five-set playlist for AOL Sessions that included "Scar Tissue" and "Californication".[37][38][39] The album produced many staple hits for the Chili Peppers; five of the sixteen songs on their Greatest Hits album were taken from Californication.[40]

The album received criticism for what Tim Anderson of The Guardian called "excessive compression and distortion" in the process of digital mastering.[41]Stylus Magazine labeled it as one of the victims of the loudness war and commented that it suffered from digital clipping so much that "even non-audiophile consumers complained about it".[42] An early, alternately mastered version of the album with a different track listing and mixing, probably a pre-release candidate, has been circulated on the internet.[43]

[edit] Californication tour

Immediately following the release of Californication, the band embarked on a world tour to support the record, beginning in the United States. To culminate the US leg of their tour, the Chili Peppers were asked to close Woodstock '99, which became infamous for the resulting violence.[44][45] The band was informed minutes before arriving that the crowds and bonfires in the fields had gone out of control.[44] When the Chili Peppers performed a tribute to Jimi Hendrix's song "Fire" to finish their set as a favor to Hendrix's sister, the disruption

escalated into violence when several women, who had been crowd surfing and moshing, were raped and nearby property was looted and destroyed.[46][47][48][49] Kiedis felt that "It was clear that this situation had nothing to do with Woodstock any more. It wasn't symbolic of peace and love, but of greed and cashing in... We woke up to papers and radio stations vilifying us for playing 'Fire'." [47]

To kick off the band's European tour, the band staged a free show in Moscow's Red Square, on August 14, 1999, to a crowd of over 200,000.[50] Kiedis recalled the situation: "Red Square was so filled with wall-to-wall Russians that we needed a police escort to get near the stage." [50] Following the European leg, the group did a show in New York City, at the Windows on the World, for KROQ radio contest-winners, and then at the Big Day Out festival in Australia following several Japanese tour dates.[51] Flea, however, began to feel the repercussions of touring causing the band to set up concerts that were less strenuous, and consequently less financially rewarding, for them. These shows would finish the remainder of the Californication tour.[52] As one of the last shows before the release of their next album By the Way, the Chili Peppers played Rock in Rio 3.[53]

[edit] Accolades

The information regarding accolades attributed to Californication is adapted from AcclaimedMusic.net[39]

(*) designates unordered lists.

[edit] Track list

All songs written and composed by Red Hot Chili Peppers.Â

16.

"Quixoticelixer" Â

4:48

17.

"Over Funk" Â

2:58

18.

"Fat Dance" Â

3:40

1.

"Gong Li" Â

3:43

2.

"How Strong" Â

4:42

3.

"Instrumental #2" Â

2:43

[edit] Personnel

Red Hot Chili Peppers

Additional musicians

Recording personnel

Lindsay ChaseÂ ^ production coordinator

Mike Nicholson and Greg CollinsÂ ^ additional engineering

Greg FidelmanÂ ^ additional engineering

Jennifer HilliardÂ ^ assistant engineer

Chris HolmesÂ ^ mix engineer

Ok Hee KimÂ ^ assistant engineer

Vlado MellerÂ ^ mastering

Rick RubinÂ ^ production

David SchiffmanÂ ^ additional engineering

Jim ScottÂ ^ engineer, mixing

John SorensonÂ ^ additional engineering

Additional personnel

[edit] Charts, certifications and sales

[edit] Singles

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[edit] Bibliography

[edit] External links

"Gender Bender"

The X-Files episode

Episode no.

SeasonÂ 1

Episode 14

Directed by

Rob Bowman

Written by

Larry Barber

Paul Barber
Production code
1X13
Original air date
January 21, 1994
Running time
43 minutes
Guest actors
Episode chronology

"Gender Bender"[nb 1] is the fourteenth episode of the first season of the American science fiction television series The X-Files. Premiering on the Fox network on January 21, 1994, it was written by Larry and Paul Barber, directed by Rob Bowman, and featured guest appearances by Brent Hinkley and Nicholas Lea. The episode is a "Monster-of-the-Week" story, a stand-alone plot which is unconnected to the series' overarching mythology.

The show centers on FBI special agents Fox Mulder (David Duchovny) and Dana Scully (Gillian Anderson) who work on cases linked to the paranormal, called X-Files. In this episode, Mulder and Scully begin investigating a series of murders following sexual encounters. The two soon discover that a member of a religious sect living in Massachusetts may be responsible—and may not be human.

The episode was inspired by producer Glen Morgan's desire for "an episode with more of a sexy edge"; however, the writers found it difficult to write a story that showed sex as scary. This difficulty led to the introduction of an Amish-like community as well. "Gender Bender" was seen by approximately 6.8Â million households in its initial broadcast. The episode has subsequently been met with mixed critical responses, facing criticism for its abrupt deus ex machina ending. Academic analysis of the episode has placed it within a science-fiction tradition that attributes a powerful, supernatural element to physical contact with aliens. It has also been seen as reflecting anxieties about emerging gender roles in the 1990s.

In a dance club, a young man is taken by a young woman, Marty (Kate Twa), for casual sex. The young man dies afterwards, and Marty leaves the room as a man (Peter Stebbings). FBI agents Fox Mulder (David Duchovny) and Dana Scully (Gillian Anderson) are called to the scene; Mulder believes that the man's death was caused by a fatal dose of pheromones. There is also ambiguity in similar murders as to the sex of the killer. Evidence from the crime scene leads the duo to an Amish-type community in Massachusetts which Mulder calls the Kindred.

Mulder approaches some of the Kindred, only to be shunned. Meanwhile, Scully befriends a member, Brother Andrew (Brent Hinkley), who is reluctant to talk. While shaking hands with him, Scully appears entranced, not coming to until Mulder catches her attention. The agents visit the Kindred's remote community, where they are asked to surrender their guns before entering. Mulder and Scully are invited to dinner. When the Kindred refuse to allow Scully to treat Brother Aaron, a sick participant at the table, Brother Andrew states that the Kindred take care of their own. Meanwhile, in another nightclub, a man convinces a girl to dance with him by touching her hand.

When the Kindred escort the agents out of the village, Mulder comments on the lack of children in the community and states that he recognizes some of the same faces from photographs taken in the 1930s. Curious, he returns to the village that night, and hears chanting as a procession of the Kindred moves to a barn. Scully is led off by Brother Andrew, who claims to be able to give her information about the murderer, whom he calls Brother Martin. Downstairs in the barn, the group can be seen bathing Brother Aaron's body in watery clay. Mulder hides in a crevice, where he discovers that the sick man has been buried alive and has begun to take on feminine features. Meanwhile, Brother Andrew uses his power to seduce Scully. She is unable to resist, and eventually needs to be rescued by Mulder. The agents are again escorted out of the village.

Another man, Michael (Nicholas Lea), is having sex with the female form of Brother Martin in a parked car, before a patrol officer breaks them up. As

Michael suddenly starts retching, the officer is attacked by Brother Martin, who changes into a man and escapes. In the hospital Michael reluctantly reveals to Mulder and Scully that when he looked out of the car, the girl he was with "looked like a man". The agents are then alerted about activity on a previous victim's credit card, which was stolen by Brother Martin. The agents chase Brother Martin into an alley, only to have the Kindred appear and take him away. That night the agents rush back to the village which now bears a deserted look. The underground tunnels are blocked entirely with the white clay. Mulder and Scully walk into the nearby field where they find a large crop circle, suggesting that the Kindred are aliens.

[edit] Production

While discussing the installment's origins, producer Glen Morgan said that he "wanted an episode with more of a sexy edge". It proved difficult to portray sex as convincingly scary, which caused the producers to introduce the concept of "people like the Amish who are from another planet". "Gender Bender" was penned by freelance writers Larry and Paul Barber, whose initial draft focused heavily on the contrast between the farming community of the Kindred and a version of city life "with very sexual connotations", influenced by the works of Swiss artist H. R. Giger. This script went through various rewrites during the development process, including the removal of a scene where someone's crotch rots away, to address concerns about the content of the episode. The chants uttered by the Kindred were not in the script handed in by the Barbers; they were added later by producer Paul Rabwin.

The character of Marty was portrayed by two actorsâKate Twa plays its female form and Peter Stebbings the male. Twa was the first of the two to be cast, leading producer R. W. Goodwin to base the casting of Stebbings mostly on his "very strong resemblance" to the actress. This resemblance was exploited in a scene showing Twa morphing into Stebbings; however, Goodwin felt that the two actors were too similar for the effect to be readily apparent, "zapp[ing] the energy out of the moment". Nicholas Lea, who played a would-be victim in the episode, would return to the series in a recurring role as Alex Krycek, beginning with the second season's "Sleepless". Twa would also return that season, playing a former colleague of Scully in "Soft Light".

"Gender Bender" marked Rob Bowman's directorial debut on the series; he would become one of the series' most prolific directors, even directing the 1998 film adaptation, *The X-Files: Fight the Future*.^[13] Bowman found "Gender Bender" a difficult episode to work onâthe script had initially called for lantern light to illuminate several scenes, but this was found to be unworkable. In addition, an interior set constructed to represent the catacombs under the Kindred's barn was so encumbering to film in that a second unit crew were required to reshoot a large degree of camera coverage. This need for extra footage necessitated an additional day of filming for scenes featuring Duchovny.

The exterior shots of the village inhabited by the Kindred were filmed at a historic farm preserved from the 1890s in Langley, British Columbia, while interior sets were simply built on a sound stage. The small town visited by the agents was filmed on location in Steveston, British Columbiaâa location which would be revisited to film the first-season episode "Miracle Man". The music used in the episode's nightclub scenes was recycled from composer Mark Snow's earlier work on the television film *In the Line of Duty: Street War*.

[edit] Themes

"Gender Bender" has been interpreted as representing contemporary sexual anxieties in a figurative manner, conflating seduction with alien abduction. M. Keith Booker has described the Kindred's shapeshifting as representative of contemporary sexual anxieties caused by the changing gender roles of the decade, coupled with "a basic fear of sexual contact". Antonio Ballesteros Gonz lez has stated that the episode is representative of the series' exploration of both seduction and abduction, noting that "both are seen as part of sexual aggression", further describing the episode's villain as representing "the fear of sex and reproduction". The lethal nature of the Kindred's touch has been cited as representing the potency of their sexual repression; and has

been placed within a science-fiction tradition that depicts aliens or outsiders with a "potent" touch, alongside similar depictions in the films *Communion* and *E.T. The Extra-Terrestrial*, and the novel *The Puppet Masters*.

[edit] Broadcast and reception

"Gender Bender" originally aired on Fox on January 21, 1994, and was first broadcast in the United Kingdom on BBC Two on December 22, 1994.[22] The episode earned a Nielsen household rating of 7.2, with a 12% share. It was viewed by 6.8 million households and 11.1 million viewers, meaning that roughly 7.2 percent of all television-equipped households, and 12 percent of households watching television, were tuned in to the episode.[24]

The episode faced criticism from the crew over its ending using a *deus ex machina* to indicate that the Kindred may have been aliens. Producer James Wong felt that the episode's ending seemed overly abrupt and unexpected, describing it as appearing "like we tried to play a trick on the audience to make them say 'Ooh, what the heck was that?'". He added that the lack of a real connection to the episode's plot meant that the revelation lost any sense of catharsis for the viewer. Morgan said that the episode "went too far. At what point do we become unbelievable?" In addition, when asked about the similarity between the Kindred and the Amish, series creator Chris Carter noted that "they [the Amish] don't watch TV, so I wasn't worried about it".

"Gender Bender" received generally positive to mixed reviews from critics. In a retrospective of the first season in *Entertainment Weekly*, "Gender Bender" was rated "B+", being described as a "clever idea" that was "undermined by a bushel of burning questions".[25] Zack Handlen, writing for *The A.V. Club*, praised the episode, rating it an "A". He felt that the plot was "a perfect mixture of scientific theory, unsubstantiated rumor, and memorable visuals".[26] Handlen felt that the episode effectively represented the ideal plot for *The X-Files*, featuring someone briefly interacting with supernatural phenomena without ever learning the truth of their experience.[26] Matt Haigh, writing for *Den of Geek*, reviewed "Gender Bender" positively, feeling that it was "a nicely refreshing and original idea", with "strikingly atmospheric" sets and "impressively spooky" villains.[27]

Robert Shearman and Lars Pearson, in their book *Wanting to Believe: A Critical Guide to The X-Files, Millennium & The Lone Gunmen*, rated "Gender Bender" one-and-a-half stars out of five, finding that it "finishes up... entirely clichéd". Shearman felt that Bowman's direction, and the contrast between "decadent" night-life and the "restraint and denial" of the Kindred, were highlights of the episode. However, he also felt that it approached its themes too conservatively and tamely, leaving a "boring" end result. In his book *The Nitpicker's Guide for X-Files*, author Phil Farrand has highlighted several inconsistencies in the episode, focusing on the implausible nature of the ending. Farrand cites the mention of the Kindred's pheromones containing human DNA and their use of the English language when in private as elements which seem incongruous for an alien race.[29]

^ Some sources give the episode's title as "Genderbender".[3]

^ Erickson, Hal. "The X-Files: Genderbender". *Trailers, Reviews, Synopsis, Showtime, and Cast*. AllMovie. AllRovi.

<http://www.allmovie.com/movie/the-x-files-genderbender-v210571>. Retrieved July 2, 2012.

^ Rob Bowman (director); Chris Carter & Frank Spotnitz (writers) (June 19, 1998). "The X-Files". Fox.

^ Robert Mandel, et al. (booklet). *The X-Files: The Complete First Season* (Liner notes). Fox.

^ "Nielsen Ratings". *USA Today* (Gannett Company, Inc.): p. D3. 26 January 1994. http://anythingkiss.com/pi_feedback_challenge/Ratings/19931129-19940227_TVRating_s.pdf. Retrieved 28 November 2012.

^ "X Cyclopedia: The Ultimate Episode Guide, Season 1". *Entertainment Weekly*.

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^ a b Handlen, Zack (July 18, 2008). "'Beyond the Sea' / 'Gender Bender' / 'Lazarus' | The X-Files/Millennium | TV Club | TV". The A.V. Club. The Onion. <http://www.avclub.com/articles/beyond-the-seagender-benderlazarus,13085/>. Retrieved September 25, 2012.

^ Haigh, Matt (November 10, 2008). "Revisiting The X-Files: Season 1 Episode 14". Den of Geek. Dennis Publishing. http://www.denofgeek.com/television/144195/revisiting_the_xfiles_season_1_episode_14.html. Retrieved August 1, 2011.

^ Farrand 1997, p. 91.

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[edit] External links

Huntington's disease (HD) is a neurodegenerative genetic disorder that affects muscle coordination and leads to cognitive decline and psychiatric problems. It typically becomes noticeable in mid-adult life. HD is the most common genetic cause of abnormal involuntary writhing movements called chorea, which is why the disease used to be called Huntington's chorea.

It is much more common in people of Western European descent than in those of Asian or African ancestry. The disease is caused by an autosomal dominant mutation in either of an individual's two copies of a gene called Huntingtin, which means any child of an affected person typically has a 50% chance of inheriting the disease. Physical symptoms of Huntington's disease can begin at any age from infancy to old age, but usually begin between 35 and 44 years of age. Through genetic anticipation, the disease may develop earlier in life in each successive generation. About 6% of cases start before the age of 21 years with an akinetic-rigid syndrome; they progress faster and vary slightly. The variant is classified as juvenile, akinetic-rigid or Westphal variant HD.

The Huntingtin gene provides the genetic information for a protein that is also called "huntingtin". Expansion of a CAG triplet repeat stretch within the Huntingtin gene results in a different (mutant) form of the protein, which gradually damages cells in the brain, through mechanisms that are not fully understood. The genetic basis of HD was discovered in 1993 by an international collaborative effort spearheaded by the Hereditary Disease Foundation.

Genetic testing can be performed at any stage of development, even before the onset of symptoms. This fact raises several ethical debates: the age at which

an individual is considered mature enough to choose testing; whether parents have the right to have their children tested; and managing confidentiality and disclosure of test results. Genetic counseling has developed to inform and aid individuals considering genetic testing and has become a model for other genetically dominant diseases.

Symptoms of the disease can vary between individuals and even among affected members of the same family, but usually progress predictably. The earliest symptoms are often subtle problems with mood or cognition. A general lack of coordination and an unsteady gait often follows. As the disease advances, uncoordinated, jerky body movements become more apparent, along with a decline in mental abilities and behavioral and psychiatric problems. Physical abilities are gradually impeded until coordinated movement becomes very difficult. Mental abilities generally decline into dementia. Complications such as pneumonia, heart disease, and physical injury from falls reduce life expectancy to around twenty years after symptoms begin. There is no cure for HD, and full-time care is required in the later stages of the disease. Existing pharmaceutical and non-drug treatments can relieve many of its symptoms.

Research and support organizations, first founded in the 1960s and increasing in number, work to increase public awareness, to provide support for individuals and their families, and to promote and facilitate research. Many new research discoveries have been made and understanding of the disease is improving. Current research directions include determining the exact mechanism of the disease, improving animal models to expedite research, clinical trials of pharmaceuticals to treat symptoms or slow the progression of the disease, and studying procedures such as stem cell therapy with the goal of repairing damage caused by the disease.

[edit] Signs and symptoms

Symptoms of Huntington's disease commonly become noticeable between the ages of 35 and 44 years, but they can begin at any age from infancy to old age.[1][2] In the early stages, there are subtle changes in personality, cognition, and physical skills.[1] The physical symptoms are usually the first to be noticed, as cognitive and psychiatric symptoms are generally not severe enough to be recognized on their own at the earlier stages.[1] Almost everyone with Huntington's disease eventually exhibits similar physical symptoms, but the onset, progression and extent of cognitive and psychiatric symptoms vary significantly between individuals.[3][4]

The most characteristic initial physical symptoms are jerky, random, and uncontrollable movements called chorea.[1] Chorea may be initially exhibited as general restlessness, small unintentionally initiated or uncompleted motions, lack of coordination, or slowed saccadic eye movements.[1] These minor motor abnormalities usually precede more obvious signs of motor dysfunction by at least three years.[3] The clear appearance of symptoms such as rigidity, writhing motions or abnormal posturing appear as the disorder progresses.[5] These are signs that the system in the brain that is responsible for movement has been affected.[6] Psychomotor functions become increasingly impaired, such that any action that requires muscle control is affected. Common consequences are physical instability, abnormal facial expression, and difficulties chewing, swallowing and speaking.[5] Eating difficulties commonly cause weight loss and may lead to malnutrition.[7][8] Sleep disturbances are also associated symptoms.[9] Juvenile HD differs from these symptoms in that it generally progresses faster and chorea is exhibited briefly, if at all, with rigidity being the dominant symptom. Seizures are also a common symptom of this form of HD.[5]

Reported prevalences of behavioral and psychiatric symptoms in Huntington's disease[10]

Irritability

38% ^73%

Apathy

34% ^76%

Anxiety

34% ^61%

Depressed mood

33% ^69%

Obsessive and compulsive

10% ^52%

Psychotic

3% ^11%

Cognitive abilities are impaired progressively.[6] Especially affected are executive functions which include planning, cognitive flexibility, abstract thinking, rule acquisition, initiating appropriate actions and inhibiting inappropriate actions.[6] As the disease progresses, memory deficits tend to appear. Reported impairments range from short-term memory deficits to long-term memory difficulties, including deficits in episodic (memory of one's life), procedural (memory of the body of how to perform an activity) and working memory.[6] Cognitive problems tend to worsen over time, ultimately leading to dementia.[6] This pattern of deficits has been called a subcortical dementia syndrome to distinguish it from the typical effects of cortical dementias e.g. Alzheimer's disease.[6]

Reported neuropsychiatric manifestations are anxiety, depression, a reduced display of emotions (blunted affect), egocentrism, aggression, and compulsive behavior, the latter of which can cause or worsen addictions, including alcoholism, gambling, and hypersexuality.[10] Difficulties in recognizing other people's negative expressions have also been observed.[6] The prevalence of these symptoms is highly variable between studies, with estimated rates for lifetime prevalence of psychiatric disorders between 33% and 76%.[10] For many sufferers and their families, these symptoms are among the most distressing aspects of the disease, often affecting daily functioning and constituting reason for institutionalization.[10] Suicidal thoughts and suicide attempts are more common than in the general population.[1]

Mutant Huntingtin is expressed throughout the body and associated with abnormalities in peripheral tissues that are directly caused by such expression outside the brain. These abnormalities include muscle atrophy, cardiac failure, impaired glucose tolerance, weight loss, osteoporosis and testicular atrophy.[11]

[edit] Genetics

All humans have two copies of the Huntingtin gene (HTT), which codes for the protein Huntingtin (Htt). The gene is also called HD and IT15, which stands for 'interesting transcript 15'. Part of this gene is a repeated section called a trinucleotide repeat, which varies in length between individuals and may change length between generations. When the length of this repeated section reaches a certain threshold, it produces an altered form of the protein, called mutant Huntingtin protein (mHtt). The differing functions of these proteins are the cause of pathological changes which in turn cause the disease symptoms. The Huntington's disease mutation is genetically dominant and almost fully penetrant: mutation of either of a person's HTT genes causes the disease. It is not inherited according to sex, but the length of the repeated section of the gene, and hence its severity can be influenced by the sex of the affected parent.[12]

[edit] Genetic mutation

HD is one of several trinucleotide repeat disorders which are caused by the length of a repeated section of a gene exceeding a normal range.[13] The HTT gene is located on the short arm of chromosome 4[13] at 4p16.3. HTT contains a sequence of three DNA bases—cytosine-adenine-guanine (CAG)—repeated multiple times (i.e. ... CAGCAGCAG ...), known as a trinucleotide repeat.[13] CAG is the genetic code for the amino acid glutamine, so a series of them results in the production of a chain of glutamine known as a polyglutamine tract (or polyQ tract), and the repeated part of the gene, the PolyQ region.[14]

Classification of the trinucleotide repeat, and resulting disease status, depends on the number of CAG repeats[13]

Repeat count

Classification

Disease status

Risk to offspring

<26

Normal

Will not be affected

None

27-35

Intermediate

Will not be affected

Elevated but <50%

36-39

Reduced Penetrance

May or may not be affected

50%

40+

Full Penetrance

Will be affected

50%

Generally, people have fewer than 36 repeated glutamines in the polyQ region which results in production of the cytoplasmic protein Huntingtin.[13] However, a sequence of 36 or more glutamines results in the production of a protein which has different characteristics.[13] This altered form, called mHtt (mutant Htt), increases the decay rate of certain types of neurons. Regions of the brain have differing amounts and reliance on these type of neurons, and are affected accordingly.[5] Generally, the number of CAG repeats is related to how much this process is affected, and accounts for about 60% of the variation of the age of the onset of symptoms. The remaining variation is attributed to environment and other genes that modify the mechanism of HD.[13] 36-39 repeats result in a reduced-penetrance form of the disease, with a much later onset and slower progression of symptoms. In some cases the onset may be so late that symptoms are never noticed.[15] With very large repeat counts, HD has full penetrance and can occur under the age of 20, when it is then referred to as juvenile HD, akinetic-rigid, or Westphal variant HD. This accounts for about 7% of HD carriers.[16]

[edit] Inheritance

Huntington's disease has autosomal dominant inheritance, meaning that an affected individual typically inherits one copy of the gene with an expanded trinucleotide repeat (the mutant allele) from an affected parent.[1] Since penetrance of the mutation is very high, those who have a mutated copy of the gene will have the disease. In this type of inheritance pattern, each offspring of an affected individual has a 50% risk of inheriting the mutant allele and therefore being affected with the disorder (see figure). This probability is sex-independent.[17]

Trinucleotide CAG repeats over 28 are unstable during replication and this instability increases with the number of repeats present.[15] This usually leads to new expansions as generations pass (dynamic mutations) instead of reproducing an exact copy of the trinucleotide repeat.[13] This causes the number of repeats to change in successive generations, such that an unaffected parent with an "intermediate" number of repeats (28-35), or "reduced penetrance" (36-40), may pass on a copy of the gene with an increase in the number of repeats that produces fully penetrant HD.[13] Such increases in the number of repeats (and hence earlier age of onset and severity of disease) in successive generations is known as genetic anticipation.[13] Instability is greater in spermatogenesis than oogenesis;[13] maternally inherited alleles are usually of a similar repeat length, whereas paternally inherited ones have a higher chance of increasing in length.[13][18] It is rare for Huntington's disease to be caused by a new mutation, where neither parent has over 36 CAG repeats.[19]

In the rare situations where both parents have an expanded HD gene, the risk

increases to 75%, and when either parent has two expanded copies, the risk is 100% (all children will be affected). Individuals with both genes affected are rare. For some time HD was thought to be the only disease for which possession of a second mutated gene did not affect symptoms and progression,[20] but it has since been found that it can affect the phenotype and the rate of progression.[13][21]

[edit] Mechanism

The Htt protein interacts with over 100 other proteins, and appears to have multiple biological functions.[22] The behavior of this mutated protein is not completely understood, but it is toxic to certain cell types, particularly in the brain. Early damage is most evident in the striatum, but as the disease progresses, other areas of the brain are also more conspicuously affected. Early symptoms are attributable to functions of the striatum and its cortical connections - namely control over movement, mood and higher cognitive function.[12]

[edit] Htt function

Htt is expressed in all mammalian cells. The highest concentrations are found in the brain and testes, with moderate amounts in the liver, heart, and lungs.[12] The function of Htt in humans is unclear. It interacts with proteins which are involved in transcription, cell signaling and intracellular transporting.[12][23] In animals genetically modified to exhibit HD, several functions of Htt have been found.[24] In these animals, Htt is important for embryonic development, as its absence is related to embryonic death. It also acts as an anti-apoptotic agent preventing programmed cell death and controls the production of brain-derived neurotrophic factor, a protein which protects neurons and regulates their creation during neurogenesis. Htt also facilitates vesicular transport and synaptic transmission and controls neuronal gene transcription.[24] If the expression of Htt is increased and more Htt produced, brain cell survival is improved and the effects of mHtt are reduced, whereas when the expression of Htt is reduced, the resulting characteristics are more typical of the presence of mHtt.[24] In humans the disruption of the normal gene does not cause the disease.[12] It is thought that the disease is not caused by inadequate production of Htt, but by a gain of toxic function of mHtt.[12]

[edit] Cellular changes due to mHtt

There are multiple cellular changes through which the toxic function of mHtt may manifest and produce the HD pathology.[25][26] During the biological process of posttranslational modification of mHtt, cleavage of the protein can leave behind shorter fragments constituted of parts of the polyglutamine expansion.[25] The polar nature of glutamine causes interactions with other proteins when it is overabundant in Htt proteins. Thus, the mHtt molecule strands will form hydrogen bonds with one another, forming a protein aggregate rather than folding into functional proteins.[27] Over time, the aggregates accumulate, ultimately interfering with neuron function because these fragments can then misfold and coalesce, in a process called protein aggregation, to form inclusion bodies within cells.[25][27] Neuronal inclusions run indirect interference. The excess protein aggregates clump together at axons and dendrites in neurons which mechanically stops the transmission of neurotransmitters because vesicles (filled with neurotransmitters) can no longer move through the cytoskeleton. Ultimately, over time, less and less neurotransmitters are available for release in signaling other neurons as the neuronal inclusions grow.[27] Inclusion bodies have been found in both the cell nucleus and cytoplasm.[25] Inclusion bodies in cells of the brain are one of the earliest pathological changes, and some experiments have found that they can be toxic for the cell, but other experiments have shown that they may form as part of the body's defense mechanism and help protect cells.[25]

Several pathways by which mHtt may cause cell death have been identified. These include: effects on chaperone proteins, which help fold proteins and remove misfolded ones; interactions with caspases, which play a role in the process of removing cells; the toxic effects of glutamine on nerve cells;

impairment of energy production within cells; and effects on the expression of genes. The cytotoxic effects of mHtt are strongly enhanced by interactions with a protein called Rhes, which is expressed mainly in the striatum.[28] Rhes was found to induce sumoylation of mHtt, which causes the protein clumps to disaggregate~studies in cell culture showed that the clumps were much less toxic than the disaggregated form.[28]

An additional theory that explains another way cell function may be disrupted by HD proposes that damage to mitochondria in striatal cells (numerous accounts of mitochondrial metabolism deficiency have been found) and the interactions of the altered huntingtin protein with numerous proteins in neurons leads to an increased vulnerability of glutamine, which, in large amounts, has been found to be an excitotoxin. Excitotoxins may cause damage to numerous cellular structures. Although glutamine is not found in excessively high amounts, it has been postulated that because of the increased vulnerability, even normal amounts glutamine can cause excitotoxins to be expressed.[29][30]

[edit] Macroscopic changes due to mHtt

HD affects the whole brain, but certain areas are more vulnerable than others. The most prominent early effects are in a part of the basal ganglia called the neostriatum, which is composed of the caudate nucleus and putamen.[12] Other areas affected include the substantia nigra, layers 3, 5 and 6 of the cerebral cortex, the hippocampus, purkinje cells in the cerebellum, lateral tuberal nuclei of the hypothalamus and parts of the thalamus.[13] These areas are affected according to their structure and the types of neurons they contain, reducing in size as they lose cells.[13] Striatal spiny neurons are the most vulnerable, particularly ones with projections towards the external globus pallidus, with interneurons and spiny cells projecting to the internal pallidum being less affected.[13][31] HD also causes an abnormal increase in astrocytes and activation of the brain's immune cells, microglia.[32]

The basal ganglia~the part of the brain most prominently affected in early HD~play a key role in movement and behavior control. Their functions are not fully understood, but current theories propose that they are part of the cognitive executive system[6] and the motor circuit.[33] The basal ganglia ordinarily inhibit a large number of circuits that generate specific movements. To initiate a particular movement, the cerebral cortex sends a signal to the basal ganglia that causes the inhibition to be released. Damage to the basal ganglia can cause the release or reinstatement of the inhibitions to be erratic and uncontrolled, which results in an awkward start to motion or motions to be unintentionally initiated, or a motion to be halted before, or beyond, its intended completion. The accumulating damage to this area causes the characteristic erratic movements associated with HD.[33]

[edit] Transcriptional dysregulation

CREB-binding protein (CBP), a transcription factor, is essential for cell function because as a coactivator at a significant number of promoters, it activates the transcription of genes for survival pathways.[30] Furthermore, the amino acids that form CBP include a strip of 18 glutamines. Thus, the glutamines on CBP interact directly with the increased numbers of glutamine on the Htt chain and CBP gets pulled away from its typical location next to the nucleus.[34] Specifically, CRB contains an acetyltransferase domain that, in an experiment performed by Steffan and colleagues, showed that a Htt exon 1 with 51 glutamines bound to this domain in CBP.[30] Autopsied brains of those who had Huntington's disease also have been found to have incredibly reduced amounts of CBP.[34] In addition, when CBP is overexpressed, polyglutamine-induced death is diminished, further demonstrating that CBP plays an important role in Huntington's disease and neurons in general.[30]

[edit] Diagnosis

Medical diagnosis of the onset of HD can be made following the appearance of physical symptoms specific to the disease.[1] Genetic testing can be used to confirm a physical diagnosis if there is no family history of HD. Even before the onset of symptoms, genetic testing can confirm if an individual or embryo carries an expanded copy of the trinucleotide repeat in the HTT gene that

causes the disease. Genetic counseling is available to provide advice and guidance throughout the testing procedure, and on the implications of a confirmed diagnosis. These implications include the impact on an individual's psychology, career, family planning decisions, relatives and relationships. Despite the availability of pre-symptomatic testing, only 5% of those at risk of inheriting HD choose to do so.[12]

[edit] Clinical

A physical examination, sometimes combined with a psychological examination, can determine whether the onset of the disease has begun.[1] Excessive unintentional movements of any part of the body are often the reason for seeking medical consultation. If these are abrupt and have random timing and distribution, they suggest a diagnosis of HD. Cognitive or psychiatric symptoms are rarely the first diagnosed; they are usually only recognized in hindsight or when they develop further. How far the disease has progressed can be measured using the unified Huntington's disease rating scale which provides an overall rating system based on motor, behavioral, cognitive, and functional assessments.[36][37] Medical imaging, such as computerized tomography (CT) and magnetic resonance imaging (MRI), can show atrophy of the caudate nuclei early in the disease, as seen in the illustration, but these changes are not diagnostic of HD. Cerebral atrophy can be seen in the advanced stages of the disease. Functional neuroimaging techniques such as fMRI and PET can show changes in brain activity before the onset of physical symptoms but are experimental tools, and not used clinically.[13]

[edit] Genetic

Because HD follows an autosomal dominant pattern of inheritance, there is a strong motivation for individuals who are at risk of inheriting it to seek a diagnosis. The genetic test for HD consists of a blood test which counts the numbers of CAG repeats in each of the HTT alleles.[38] A positive result is not considered a diagnosis, since it may be obtained decades before the symptoms begin. However, a negative test means that the individual does not carry the expanded copy of the gene and will not develop HD.[13]

A pre-symptomatic test is a life-changing event and a very personal decision.[13] The main reason given for choosing testing for HD is to aid in career and family decisions.[13] Over 95% of individuals at risk of inheriting HD do not proceed with testing, mostly because there is no treatment.[13] A key issue is the anxiety an individual experiences about not knowing whether they will eventually develop HD, compared to the impact of a positive result.[12] Irrespective of the result, stress levels have been found to be lower two years after being tested, but the risk of suicide is increased after a positive test result.[12] Individuals found to have not inherited the disorder may experience survivor guilt with regard to family members who are affected.[12] Other factors taken into account when considering testing include the possibility of discrimination and the implications of a positive result, which usually means a parent has an affected gene and that the individual's siblings will be at risk of inheriting it.[12] Genetic counseling in HD can provide information, advice and support for initial decision-making, and then, if chosen, throughout all stages of the testing process.[39]

Counseling and guidelines on the use of genetic testing for HD have become models for other genetic disorders, such as autosomal dominant cerebellar ataxias.[12][40][41] Presymptomatic testing for HD has also influenced testing for other illnesses with genetic variants such as polycystic kidney disease, familial Alzheimer's disease and breast cancer.[40] The European Molecular Genetics Quality Network have published yearly external quality assessment scheme for molecular genetic testing for this disease and have developed best practice guidelines for genetic testing for HD to assist in testing and reporting of results.[42]

[edit] Preimplantation genetic diagnosis

Embryos produced using in vitro fertilization may be genetically tested for HD using preimplantation genetic diagnosis (PGD). This technique, where one or two cells are extracted from a typically 4 to 8 cell embryo and then tested for the

genetic abnormality, can then be used to ensure embryos affected with HD genes are not implanted, and therefore any offspring will not inherit the disease. Some forms of preimplantation genetic diagnosis ~ non-disclosure or exclusion testing ~ allow at-risk people to have HD-free offspring without revealing their own parental genotype, giving no information about whether they themselves are destined to develop HD. In exclusion testing, the embryos' DNA is compared with that of the parents and grandparents to avoid inheritance of the chromosomal region containing the HD gene from the affected grandparent. In non-disclosure testing, only disease-free embryos are replaced in the uterus while the parental genotype and hence parental risk for HD are never disclosed.[43][44]

[edit] Prenatal testing

It is also possible to obtain a prenatal diagnosis for an embryo or fetus in the womb, using fetal genetic material acquired through chorionic villus sampling. This, too, can be paired with exclusion testing to avoid disclosure of parental genotype. Prenatal testing is performed on the understanding that if the fetus is found to carry an expanded HTT gene (or, in exclusion testing, found to be at 'high risk'), the pregnancy will be terminated.[45]

[edit] Differential diagnosis

About 99% of HD diagnoses based on the typical symptoms and a family history of the disease are confirmed by genetic testing to have the expanded trinucleotide repeat that causes HD. Most of the remaining are called HD-like disorders.[5][46] Most of these other disorders are collectively labelled HD-like (HDL).[46] The cause of most HDL diseases is unknown, but those with known causes are due to mutations in the prion protein gene (HDL1), the junctophilin 3 gene (HDL2), a recessively inherited HTT gene (HDL3 ~only found in one family and poorly understood), and the gene encoding the TATA box-binding protein (HDL4/SCA17).[46] Other autosomal dominant diseases that can be misdiagnosed as HD are dentatorubral-pallidoluysian atrophy and neuroferritinopathy.[46] There are also autosomal recessive disorders that resemble sporadic cases of HD. Main examples are chorea acanthocytosis, pantothenate kinase-associated neurodegeneration and X-linked McLeod syndrome.[46]

[edit] Management

There is no cure for HD, but there are treatments available to reduce the severity of some of its symptoms.[47] For many of these treatments, comprehensive clinical trials to confirm their effectiveness in treating symptoms of HD specifically are incomplete.[48][49] As the disease progresses the ability to care for oneself declines and carefully managed multidisciplinary caregiving becomes increasingly necessary.[48] Although there have been relatively few studies of exercises and therapies that help rehabilitate cognitive symptoms of HD, there is some evidence for the usefulness of physical therapy, occupational therapy, and speech therapy.[1]

Tetrabenazine was approved in 2008 for treatment of chorea in Huntington's disease in the US.[50] Other drugs that help to reduce chorea include neuroleptics and benzodiazepines.[2] Compounds such as amantadine or remacemide are still under investigation but have shown preliminary positive results.[51]Hypokinesia and rigidity, especially in juvenile cases, can be treated with antiparkinsonian drugs, and myoclonic hyperkinesia can be treated with valproic acid.[2]

Psychiatric symptoms can be treated with medications similar to those used in the general population.[48][49]Selective serotonin reuptake inhibitors and mirtazapine have been recommended for depression, while atypical antipsychotic drugs are recommended for psychosis and behavioral problems.[49] Specialist neuropsychiatric input is recommended as patients may require long-term treatment with multiple medications in combination.[1]

Weight loss and eating difficulties due to dysphagia and other muscle discoordination are common, making nutrition management increasingly important as the disease advances.[48]Thickening agents can be added to liquids as thicker fluids are easier and safer to swallow.[48] Reminding the patient to

eat slowly and to take smaller pieces of food into the mouth may also be of use to prevent choking.[48] If eating becomes too hazardous or uncomfortable, the option of using a percutaneous endoscopic gastrostomy is available. This is a feeding tube, permanently attached through the abdomen into the stomach, which reduces the risk of aspirating food and provides better nutritional management.[52] Assessment and management by speech and language therapists with experience in Huntington's disease is recommended.[1]

Patients with Huntington's disease may see a physical therapist for non-invasive and non-medication-based ways of managing the physical symptoms. Physical therapists may implement fall risk assessment and prevention, as well as strengthening, stretching, and cardiovascular exercises. Walking aids may be prescribed as appropriate. Physical therapists also prescribe breathing exercises and airway clearance techniques with the development of respiratory problems.[53] Consensus guidelines on physiotherapy in Huntington's disease have been produced by the European HD Network.[53] Goals of early rehabilitation interventions are prevention of loss of function. Participation in rehabilitation programs during early to middle stage of the disease may be beneficial as it translates into long term maintenance of motor and functional performance. Rehabilitation during the late stage aims to compensate for motor and functional losses.[54] For long-term independent management, the therapist may develop home exercise programs for appropriate patients.[55]

The families of individuals, who have inherited or are at risk of inheriting HD, have generations of experience of HD which may be outdated and lack knowledge of recent breakthroughs and improvements in genetic testing, family planning choices, care management, and other considerations. Genetic counseling benefits these individuals by updating their knowledge, dispelling any myths they may have and helping them consider their future options and plans.[12][56]

[edit] Prognosis

The length of the trinucleotide repeat accounts for 60% of the variation in the age symptoms appear and the rate they progress. A longer repeat results in an earlier age of onset and a faster progression of symptoms.[13][57] Individuals with more than sixty repeats often develop the disease before age 20, while those with fewer than 40 repeats may not ever develop noticeable symptoms.[58] The remaining variation is due to environmental factors and other genes that influence the mechanism of the disease.[13]

Life expectancy in HD is generally around 20 years following the onset of visible symptoms.[5] Most life-threatening complications result from muscle coordination and, to a lesser extent, behavioral changes induced by declining cognitive function. The largest risk is pneumonia, which causes death in one third of those with HD. As the ability to synchronize movements deteriorates, difficulty clearing the lungs and an increased risk of aspirating food or drink both increase the risk of contracting pneumonia. The second greatest risk is heart disease, which causes almost a quarter of fatalities of those with HD.[5] Suicide is the next greatest cause of fatalities, with 7.3% of those with HD taking their own lives and up to 27% attempting to do so. It is unclear to what extent suicidal thoughts are influenced by psychiatric symptoms, as they signify sufferers' desires to avoid the later stages of the disease.[59][60][61] Other associated risks include choking, physical injury from falls, and malnutrition.[5]

[edit] Epidemiology

The late onset of Huntington's disease means it does not usually affect reproduction.[12] The worldwide prevalence of HD is 5-10 cases per 100,000 persons,[62][63] but varies greatly geographically as a result of ethnicity, local migration and past immigration patterns.[12] Prevalence is similar for men and women. The rate of occurrence is highest in peoples of Western European descent, averaging around seventy per million people, and is lower in the rest of the world, e.g. one per million people of Asian and African descent.[12] Additionally, some localized areas have a much higher prevalence than their regional average.[12] One of the highest prevalences is in the isolated populations of the Lake Maracaibo region of Venezuela, where HD affects up to

seven thousand per million people.[12][64] Other areas of high localization have been found in Tasmania and specific regions of Scotland, Wales and Sweden.[61] Increased prevalence in some cases occurs due to a local founder effect, a historical migration of carriers into an area of geographic isolation.[61][65] Some of these carriers have been traced back hundreds of years using genealogical studies.[61] Genetic haplotypes can also give clues for the geographic variations of prevalence.[61][66]

Until the discovery of a genetic test, statistics could only include clinical diagnosis based on physical symptoms and a family history of HD, excluding those who died of other causes before diagnosis. These cases can now be included in statistics and as the test becomes more widely available, estimates of the prevalence and incidence of the disorder are likely to increase.[61][67] Indeed, in 2010 evidence emerged from the UK that the prevalence of HD may be as much as twice that previously estimated.[68]

[edit] History

Although Huntington's has been recognized as a disorder since at least the Middle Ages, the cause has been unknown until fairly recently. Huntington's was given different names throughout this history as understanding of the disease changed. Originally called simply 'chorea' for the jerky dancelike movements associated with the disease, HD has also been called "hereditary chorea" and "chronic progressive chorea".[70] The first definite mention of HD was in a letter by Charles Oscar Waters, published in the first edition of Robley Dunglison's *Practice of Medicine* in 1842. Waters described "a form of chorea, vulgarly called magrums", including accurate descriptions of the chorea, its progression, and the strong heredity of the disease.[71] In 1846 Charles Gorman observed how higher prevalence seemed to occur in localized regions.[71] Independently of Gorman and Waters, both students of Dunglison at Jefferson Medical College in Philadelphia,[72] Johan Christian Lund also produced an early description in 1860.[71] He specifically noted that in Setesdalen, a secluded mountain valley in Norway, there was a high prevalence of dementia associated with a pattern of jerking movement disorders that ran in families.[73]

The first thorough description of the disease was by George Huntington in 1872. Examining the combined medical history of several generations of a family exhibiting similar symptoms, he realized their conditions must be linked; he presented his detailed and accurate definition of the disease as his first paper. Huntington described the exact pattern of inheritance of autosomal dominant disease years before the rediscovery by scientists of Mendelian inheritance.

"Of its hereditary nature. When either or both the parents have shown manifestations of the diseaseÂ ... , one or more of the offspring almost invariably suffer from the diseaseÂ ... But if by any chance these children go through life without it, the thread is broken and the grandchildren and great-grandchildren of the original shakers may rest assured that they are free from the disease.".[69][74]

Sir William Osler was interested in the disorder and chorea in general, and was impressed with Huntington's paper, stating that "In the history of medicine, there are few instances in which a disease has been more accurately, more graphically or more briefly described."[71][75] Osler's continued interest in HD, combined with his influence in the field of medicine, helped to rapidly spread awareness and knowledge of the disorder throughout the medical community.[71] Great interest was shown by scientists in Europe, including Louis ThÃ©ophile Joseph Landouzy, DÃ©sirÃ©-Magloire Bourneville, Camillo Golgi, and Joseph Jules Dejerine, and until the end of the century, much of the research into HD was European in origin.[71] By the end of the 19th century, research and reports on HD had been published in many countries and the disease was recognized as a worldwide condition.[71]

During the rediscovery of Mendelian inheritance at the turn of the 20th century, HD was used tentatively as an example of autosomal dominant

inheritance.[71] The English biologist William Bateson used the pedigrees of affected families to establish that HD had an autosomal dominant inheritance pattern.[72] The strong inheritance pattern prompted several researchers, including Smith Ely Jelliffe, to attempt to trace and connect family members of previous studies.[71] Jelliffe collected information from across New York State and published several articles regarding the genealogy of HD in New England.[76] Jelliffe's research roused the interest of his college friend, Charles Davenport, who commissioned Elizabeth Muncey to produce the first field study on the East Coast of the United States of families with HD and to construct their pedigrees.[77] Davenport used this information to document the variable age of onset and range of symptoms of HD; he claimed that most cases of HD in the USA could be traced back to a handful of individuals.[77] This research was further embellished in 1932 by P. R. Vessie, who popularized the idea that three brothers who left England in 1630 bound for Boston were the progenitors of HD in the USA.[78] The claim that the earliest progenitors had been established and eugenic bias of Muncey's, Davenport, and Vessie's work contributed to misunderstandings and prejudice about HD.[72] Muncey and Davenport also popularized the idea that in the past some HD sufferers may have been thought to be possessed by spirits or victims of witchcraft, and were sometimes shunned or exiled by society.[79][80] This idea has not been proven. Researchers have found contrary evidence; for instance, the community of the family studied by George Huntington openly accommodated those who exhibited symptoms of HD.[72][79]

The search for the cause of this condition was enhanced considerably in 1968 when the Hereditary Disease Foundation (HDF) was created by Milton Wexler, a psychoanalyst based in Los Angeles, California whose wife Leonore Sabin had been diagnosed earlier that year with Huntingdon's disease.[81] The three brothers of Wexler's wife also suffered from this disease. The foundation was involved in the recruitment of over 100 scientists in the Huntington's Disease Collaborative Research Project who over a 10 year period worked to locate the responsible gene.

Thanks to the HDF, the ongoing US-Venezuela Huntington's Disease Collaborative Research Project was started in 1979, and reported a major breakthrough in 1983 with the discovery of the approximate location of a causal gene.[65] This was the result of an extensive study focusing on the populations of two isolated Venezuelan villages, Barranquitas and Lagunetas, where there was an unusually high prevalence of the disease. It involved over 18,000 people - mostly from a single extended family.

Among other innovations, the project developed DNA-marking methods which were an important step in making the Human Genome Project possible.[82] In 1993, the research group isolated the precise causal gene at 4p16.3,[83] making this the first autosomal disease locus found using genetic linkage analysis.[83][84]

In the same time frame, key discoveries concerning the mechanisms of the disorder were being made, including the findings by Anita Harding's research group on the effects of the gene's length.[85]

Modelling the disease in various types of animals, such as the transgenic mouse developed in 1996, enabled larger scale experiments. As these animals have faster metabolisms and much shorter lifespans than humans, results from experiments are received sooner, speeding research. The 1997 discovery that mHtt fragments misfold led to the discovery of the nuclear inclusions they cause. These advances have led to increasingly extensive research into the proteins involved with the disease, potential drug treatments, care methods, and the gene itself.[71][86]

The condition was formerly called 'Huntington's chorea', but this term has been replaced by 'Huntington's disease', because not all patients develop chorea, and because of the importance of cognitive and behavioral problems.[87]

[edit] Society and culture

[edit] Ethics

Huntington's disease, particularly the application of the genetic test for the disease, has raised several ethical issues. The issues for genetic testing

include defining how mature an individual should be before being considered eligible for testing, ensuring the confidentiality of results, and whether companies should be allowed to use test results for decisions on employment, life insurance or other financial matters. There was controversy when Charles Davenport proposed in 1910 that compulsory sterilization and immigration control be used for people with certain diseases, including HD, as part of the eugenics movement.[88] In vitro fertilization has some issues regarding its use of embryos. Some HD research has ethical issues due to its use of animal testing and embryonic stem cells.[89][90]

The development of an accurate diagnostic test for Huntington's disease has caused social, legal, and ethical concerns over access to and use of a person's results.[91][92] Many guidelines and testing procedures have strict procedures for disclosure and confidentiality to allow individuals to decide when and how to receive their results and also to whom the results are made available.[12] Financial institutions and businesses are faced with the question of whether to use genetic test results when assessing an individual, such as for life insurance or employment. Although the United Kingdom's insurance companies have agreed that until 2014 they will not use genetic information when writing most insurance policies,[93] Huntington's is explicitly excluded from this agreement.[94] As with other untreatable genetic conditions with a later onset, it is ethically questionable to perform pre-symptomatic testing on a child or adolescent, as there would be no medical benefit for that individual. There is consensus for testing only individuals who are considered cognitively mature, although there is a counter-argument that parents have a right to make the decision on their child's behalf. With the lack of an effective treatment, testing a person under legal age who is not judged to be competent is considered unethical in most cases.[26][95][96]

There are ethical concerns related to prenatal genetic testing or preimplantation genetic diagnosis to ensure a child is not born with a given disease.[97] For example, prenatal testing raises the issue of selective abortion, a choice considered unacceptable by some.[97] As it is a dominant disease, there are difficulties in situations in which a parent does not want to know his or her own diagnosis. This would require parts of the process to be kept secret from the parent.[97]

[edit] Support organizations

In 1968, after experiencing HD in his wife's family, Dr. Milton Wexler was inspired to start the Hereditary Disease Foundation (HDF), with the aim of curing genetic illnesses by coordinating and supporting research.[98] The foundation and Dr. Wexler's daughter, Nancy Wexler, were key parts of the research team in Venezuela which discovered the HD gene.[98]

At roughly the same time as the HDF formed, Marjorie Guthrie helped to found the Committee to Combat Huntington's Disease (now the Huntington's Disease Society of America), after her husband Woody Guthrie died from complications of HD.[99]

Since then, support and research organizations have formed in many countries around the world and have helped to increase public awareness of HD. A number of these collaborate in umbrella organizations, like the International Huntington Association and the European HD network.[100] Many support organizations hold an annual HD awareness event, some of which have been endorsed by their respective governments. For example, June 6 is designated "National Huntington's Disease Awareness Day" by the US Senate.[101]

The largest funder of Huntington's disease research globally, in terms of financial expenditure,[102] is the CHDI Foundation, a US non-profit biomedical foundation that aims to "rapidly discover and develop drugs that delay or slow Huntington's disease".[103] CHDI was formerly known as the High Q Foundation. In 2006, it spent \$50 million on Huntington's disease research.[102] CHDI collaborates with many academic and commercial laboratories globally and engages in oversight and management of research projects as well as funding.[104]

Many organizations exist to support and inform those affected by HD: see the

External Links section below.

[edit] Research directions

Research into the mechanism of HD has focused on identifying the functioning of Htt, how mHtt differs or interferes with it, and the brain pathology that the disease produces. Research is conducted using in vitro methods, animal models and human volunteers. Animal models are critical for understanding the fundamental mechanisms causing the disease and for supporting the early stages of drug development.[86] Animals with chemically induced brain injury exhibit HD-like symptoms and were initially used, but they did not mimic the progressive features of the disease.[105] The identification of the causative gene has enabled the development of many transgenic animal models including nematode worms, *Drosophila* fruit flies, mice, rats, sheep, pigs and monkeys that express mutant huntingtin and develop progressive neurodegeneration and HD-like symptoms.[86]

Three broad approaches are under study to attempt to slow the progression of Huntington's disease: reducing production of the mutant protein, improving cells' ability to survive its diverse harmful effects, and replacing lost neurons.[106]

[edit] Reducing huntingtin production

Gene silencing aims to reduce the production of the mutant protein, since HD is caused by a single dominant gene encoding a toxic protein. Gene silencing experiments in mouse models have shown that when the expression of mHtt is reduced, symptoms improve.[106] Safety of gene silencing has now been demonstrated in the large, human-like brains of primates.[107]

[edit] Improving cell survival

Among the approaches aimed at improving cell survival in the presence of mutant huntingtin are correction of transcriptional regulation using histone deacetylase inhibitors, modulating aggregation of huntingtin, improving metabolism and mitochondrial function and restoring dysfunction of synapses.[106]

[edit] Neuronal replacement

Stem cell therapy is the replacement of damaged neurons by transplantation of stem cells into affected regions of the brain. Experiments have yielded mixed results using this technique in animal models and preliminary human clinical trials.[108] Whatever their future therapeutic potential, stem cells are already a valuable tool for studying HD in the laboratory.[109]

[edit] Clinical trials

Numerous drugs have been reported to produce benefits in animals, including creatine, coenzyme Q10 and the antibiotic minocycline. Some of these have then been tested by humans in clinical trials, with more underway, but as yet none has proven effective.[51] In 2010, minocycline was found to be ineffective for humans in a multi-center trial.[110] Large observational studies involving human volunteers have revealed insights into the pathobiology of HD and supplied outcome measures for future clinical trials.[111]

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The Dodo (*Raphus cucullatus*) is an extinct flightless bird that was endemic to the island of Mauritius, east of Madagascar in the Indian Ocean. Its closest genetic relative was the also extinct Rodrigues Solitaire, the two forming the subfamily Raphinae of the family of pigeons and doves. The closest living relative of the Dodo is the Nicobar Pigeon. A white Dodo was once incorrectly thought to have existed on the nearby island of RÃ©union.

The Dodo's external appearance is evidenced only by paintings and written accounts from the 17th century. Because these vary considerably, and because only a few sketches are known to have been drawn from live specimens, its exact appearance in life remains a mystery. Similarly, little is known with certainty about its habitat and behaviour. Subfossil remains show the Dodo was about one metre (3.3Â ft) tall and may have weighed 10â ^18Â kg (22â ^40Â lb) in the wild. It has been depicted with brownish-grey plumage, yellow feet, a tuft of tail feathers, a grey, naked head, and a black, yellow, and green beak. It used gizzard stones to help digest its food, which is thought to have included fruits, and its main habitat is believed to have been the woods in the drier coastal areas of Mauritius. One account states its clutch consisted of a single egg. It is presumed that the Dodo became flightless because of the ready availability of abundant food sources and a relative absence of predators on Mauritius.

The first recorded mention of the Dodo was by Dutch sailors in 1598. In the following years, the bird was preyed upon by hungry sailors, their domesticated animals, and invasive species introduced during that time. The last widely accepted sighting of a Dodo was in 1662. Its extinction was not immediately noticed, and some considered it to be a mythical creature. In the 19th century, research was conducted on a small quantity of remains of four specimens that had been brought to Europe in the early 17th century. Since then, a large amount of subfossil material has been collected from Mauritius, mostly from the Mare aux Songes swamp. The extinction of the Dodo within only about a century of its discovery called attention to the previously unrecognised problem of human involvement in the disappearance of entire species. The Dodo achieved widespread recognition from its role in the story of Alice in Wonderland, and it has since become a fixture in popular culture, often as a symbol of extinction and obsolescence. It is frequently used as a mascot on Mauritius.

Taxonomy

The Dodo has been variously declared a small ostrich, a rail, an albatross, and a vulture. In 1842, Johannes Theodor Reinhardt proposed that Dodos were ground pigeons, based on studies of a Dodo skull he had discovered in the royal Danish collection at Copenhagen. This view was met with ridicule, but was later supported by Hugh Edwin Strickland and Alexander Gordon Melville in their 1848 monograph *The Dodo and Its Kindred*, which attempted to separate myth from reality. After dissecting the preserved head and foot of the specimen at the Oxford University Museum and comparing it with the few remains then available of the extinct Rodrigues Solitaire (*Pezophaps solitaria*) they found that the two were closely related. Strickland stated that although not identical, these birds shared many distinguishing features of the leg bones, otherwise known

only in pigeons.[10]

The Dodo was anatomically similar to pigeons in many features. Strickland pointed to the very short keratinous portion of the beak, with its long, slender, naked basal part. Other pigeons also have bare skin around their eyes, almost reaching their beak, as in Dodos. The forehead was high in relation to the beak, and the nostril was located low on the middle of the beak and surrounded by skin, a combination of features shared only with pigeons. The legs of the Dodo were generally more similar to those of terrestrial pigeons than of other birds, both in their scales and in their skeletal features. Depictions of the large crop hinted at a relationship with pigeons, in which this feature is more developed than other birds. Pigeons generally have very small clutches, and the Dodo is said to have laid a single egg. Like pigeons, the Dodo lacked the vomer and septum of the nostrils, and it shared details in the mandible, the zygomatic bone, the palate and the hallux. The Dodo differed from other pigeons mainly in the small size of the wings and the large size of the beak in proportion to the rest of the cranium.[10]

Throughout the 19th century, several species were classified as congeneric with the Dodo, including the Rodrigues Solitaire and the Réunion Solitaire, as *Didus solitarius* and *Raphus solitarius*, respectively (*Didus* and *Raphus* being names for the Dodo genus used by different authors of the time). An atypical 17th-century description of a Dodo and bones found on Rodrigues, now known to have belonged to the Rodrigues Solitaire, led Abraham Dee Bartlett to name a new species, *Didus nazarenus*, in 1852. Based on Solitaire remains, it is now a synonym of that species. Crude drawings of the Red Rail of Mauritius were also misinterpreted as Dodo species, *Didus broeckii* and *Didus herberti*.

Evolution

For many years the Dodo and the Rodrigues Solitaire were placed in a family of their own, the Raphidae (formerly Dididae), because their exact relationships with other pigeons were unresolved. Each was placed in its own monotypic family (Raphidae and Pezophapidae, respectively), as it was thought that they had evolved their similar features independently. Osteological and molecular data has since led to the dissolution of the family Raphidae, and the Dodo and Solitaire are now placed in their own subfamily, Raphinae, in the family Columbidae.

Comparison of mitochondrial cytochrome b and 12S rRNA sequences isolated from a Dodo tarsal and a Rodrigues Solitaire femur confirmed their close relationship and their placement within the Columbidae. The genetic evidence was interpreted as showing the Southeast Asian Nicobar Pigeon to be their closest living relative, followed by the Crowned Pigeons of New Guinea and the superficially Dodo-like Tooth-billed Pigeon from Samoa. The generic name of the latter is *Didunculus* ("little Dodo"), and it was called "Dodlet" by Richard Owen. The following cladogram, from Shapiro and colleagues (2002), shows the Dodo's closest relationships within the Columbidae, a clade consisting of generally ground-dwelling island endemics.

A similar cladogram was published in 2007, inverting the placement of Goura and *Didunculus* and including the Pheasant Pigeon and the Thick-billed Ground Pigeon at the base of the clade. The 2002 study indicated that the ancestors of the Solitaire and the Dodo diverged around the Paleogene-Neogene boundary. The Mascarene Islands (Mauritius, Réunion, and Rodrigues), are of volcanic origin and are less than 10 million years old. Therefore, the ancestors of both birds probably remained capable of flight for a considerable time after the separation of their lineage. The lack of mammalian herbivores competing for resources on these islands allowed the Solitaire and the Dodo to attain very large sizes. The DNA obtained from the Oxford specimen is degraded, and no usable DNA has been extracted from subfossil remains, so these findings still need to be independently verified. Another large, flightless pigeon, the Viti Levu Giant Pigeon, was described in 2001 from subfossil material from Fiji. It was only slightly smaller than the Dodo and the Solitaire, and it too is thought to have been related to the Crowned Pigeons.

Etymology

One of the original names for the Dodo was the Dutch "walghvogel", first used in the journal of Vice Admiral Wybrand van Warwijck, who visited Mauritius during the Second Dutch Expedition to Indonesia in 1598. His description, translated into English in 1599, explained the meaning of the name as follows: On their left hand was a little island which they named Heemskirk Island, and the bay it selve they called Warwick Bay... finding in this place great quantity of foules twice as bigge as swans, which they call Walghstocks or Wallowbirdes being very good meat. But finding an abundance of pigeons & popinnayes [parrots], they disdained any more to eat those great foules calling them Wallowbirds, that is to say lothsome or fulsome birdes.

Another account from that voyage, perhaps the first to mention the Dodo, states that the Portuguese referred to them as penguins. The meaning may not have been derived from penguin, but from pinion, a reference to the small wings. The crew of the Dutch ship Gelderland referred to the bird as "Dronte" (meaning "swollen") in 1602, a name that is still used in some languages. This crew also called them "griff-eendt" and "kermisgans", in reference to fowl fattened for the Kermesse festival in Amsterdam, which was held the day after they anchored on Mauritius.

The etymology of the word Dodo is unclear. Some ascribe it to the Dutch word dodoor for "sluggard", but it is more probably related to Dodaars, which means either "fat-arse" or "knot-arse", referring to the knot of feathers on the hind end. The first record of the word Dodaars is in Captain Willem Van West-Zanen's journal in 1602. The English form "Dodar" was used until the 18th century. Sir Thomas Herbert was the first to use the word Dodo in print in his 1634 travelogue, claiming it was referred to as such by the Portuguese, who had visited Mauritius in 1507. Another Englishman, Emmanuel Altham, had used the word in a 1628 letter, in which he also claimed the origin was Portuguese. As far as is known, the Portuguese did not use the word. Nevertheless, some sources still state that the word Dodo derives from the Portuguese word doudo (currently doído), meaning "fool" or "crazy". David Quammen suggested that Dodo was an onomatopoeic approximation of the bird's call, a two-note pigeon-like sound resembling "doo-doo".

The Latin name cucullatus ("hooded") was first used by Juan Eusebio Nieremberg in 1635 as *Cygnus cucullatus*, in reference to Carolus Clusius' 1605 depiction of a Dodo. In his 18th-century classic work *Systema Naturae*, Carl Linnaeus used cucullatus as the specific name, but combined it with the genus name *Struthio* (ostrich). [10] Mathurin Jacques Brisson coined the genus name *Raphus* (referring to the bustards) in 1760, resulting in the current name *Raphus cucullatus*. In 1766, Linnaeus coined the new binomial *Didus ineptus* (meaning "inept Dodo"). This has become a synonym of the earlier name because of nomenclatural priority.

Description

As no complete Dodo specimens exist, its external appearance, such as plumage and colouration, is hard to determine. Illustrations and written accounts of encounters with the Dodo between its discovery and its extinction (1598–1662) are the primary evidence for its external appearance. According to most representations, the Dodo had greyish or brownish plumage, with lighter primary feathers and a tuft of curly light feathers high on its rear end. The head was grey and naked, the beak green, black and yellow, and the legs were stout and yellowish, with black claws. Subfossil remains and remnants of the birds that were brought to Europe in the 17th century show that they were very large birds, one metre (3.3 ft) tall, and possibly weighing up to 23 kilograms (51 lb). The higher weights have been attributed to birds in captivity; weights in the wild were estimated to have been in the range 10.6–21.1 kg (23–47 lb). A later estimate gives an average weight as low as 10.2 kg (22 lb). This has been questioned, and there is still some controversy. It has been suggested that the weight depended on the season, and that individuals were fat during cool seasons, but less so during hot. The bird was sexually dimorphic: males were larger and had proportionally longer beaks. The beak was up to 23 centimetres (9.1 in) in length and had a hooked point. A study of the few remaining

feathers on the Oxford specimen head showed that they were pennaceous rather than plumaceous (downy) and most similar to those of other pigeons.

Many of the skeletal features that distinguish the Dodo and the Rodrigues Solitaire, its closest relative, from pigeons have been attributed to their flightlessness. The pelvic elements were thicker than those of flighted pigeons to support the higher weight, and the pectoral region and the small wings were paedomorphic, meaning that they were underdeveloped and retained juvenile features. The skull, trunk and pelvic limbs were peramorphic, meaning that they changed considerably with age. The Dodo shared several other traits with the Rodrigues Solitaire, such as features of the skull, pelvis, and sternum, as well as their large size. It differed in other aspects, such as being more robust and shorter than the Solitaire, having a larger skull and beak, a rounded skull roof, and smaller orbits. The Dodo's neck and legs were proportionally shorter, and it did not possess an equivalent to the knob present on the Solitaire's wrists.

Contemporary accounts

Most contemporary descriptions of the Dodo are found in ship's logs and journals of the Dutch East India Company vessels that docked in Mauritius when the Dutch Empire ruled the island. These records were used as guides for future voyages. Few contemporary accounts are reliable, as many seem to be based on earlier accounts, and none were written by scientists.

One of the earliest accounts, from van Warwijck's 1598 journal, describes the bird thus:

Blue parrots are very numerous there, as well as other birds; among which are a kind, conspicuous for their size, larger than our swans, with huge heads only half covered with skin as if clothed with a hood. These birds lack wings, in the place of which 3 or 4 blackish feathers protrude. The tail consists of a few soft incurved feathers, which are ash coloured. These we used to call 'Walghvogel', for the reason that the longer and oftener they were cooked, the less soft and more insipid eating they became. Nevertheless their belly and breast were of a pleasant flavour and easily masticated.

One of the most detailed descriptions is by Sir Thomas Herbert in *A Relation of Some Yeares Travaille into Afrique and the Greater Asia from 1634*: First here only and in Dygarrois [Rodrigues, likely referring to the Solitaire] is generated the Dodo, which for shape and rareness may antagonize the Phoenix of Arabia: her body is round and fat, few weigh less than fifty pound. It is reputed more for wonder than for food, greasie stomackes may seeke after them, but to the delicate they are offensive and of no nourishment. Her visage darts forth melancholy, as sensible of Nature's injurie in framing so great a body to be guided with complementall wings, so small and impotent, that they serve only to prove her bird. The halfe of her head is naked seeming couered with a fine vaile, her bill is crooked downwards, in midst is the trill [nostril], from which part to the end tis a light green, mixed with pale yellow tincture; her eyes are small and like to Diamonds, round and rowling; her clothing downy feathers, her train three small plumes, short and inproportionable, her legs suiting her body, her pounces sharpe, her appetite strong and greedy. Stones and iron are digested, which description will better be conceived in her representation.

Contemporary depictions

Some twenty 17th-century illustrations of the Dodo are known that could have been based on either live or stuffed specimens. All post-1638 depictions appear to be based on earlier images, around the time reports mentioning Dodos became rarer. Differences in the depictions led authors such as Anthonie Cornelis Oudemans and Masauji Hachisuka to speculate about sexual dimorphism, ontogenic traits, seasonal variation, and even the existence of different species, but these theories are not accepted today. Because details such as markings of the beak, the form of the tail feathers, and colouration vary from account to account, it is impossible to determine the exact morphology of these features, whether they signal age or sex, or if they even reflect reality. Dodo specialist Julian Hume argued that the nostrils of the living Dodo would have

been slits, as seen in the Gelderland, Cornelis Saftleven, Crocker Art Gallery, and Ustad Mansur images. According to this claim, the gaping nostrils often seen in paintings indicate that taxidermy specimens were used as models.

The travel journal of the Dutch ship Gelderland (1601-1603), rediscovered in the 1860s, contains the only known sketches of living or recently killed specimens drawn on Mauritius. They have been attributed to the professional artist Joris Joostensz Laerle, who also drew other now-extinct Mauritian birds, and to a second, less refined artist. Apart from these sketches, it is unknown how many of the other illustrations were drawn from life or from stuffed specimens, affecting their reliability.

The traditional image of the Dodo is of a very fat and clumsy bird, but this view may be exaggerated. The general opinion of scientists today is that many old European depictions were based on overfed captive birds or crudely stuffed specimens. Dutch painter Roelant Savery was the most prolific and influential illustrator of the Dodo, having made at least ten depictions, often showing it in the lower corners. A famous painting of his from 1626, now called Edwards' Dodo as it was once owned by George Edwards, has since become the standard image of a Dodo. It is housed in the British Museum. The image shows a particularly fat bird and is the source for many other Dodo illustrations.

An Indian Mughal painting rediscovered in St. Petersburg in the 1950s shows a Dodo along with native Indian birds. It depicts a slimmer, brownish bird, and its discoverer A. Iwanow and Dodo specialist Julian Hume regard it as one of the most accurate depictions of the living Dodo; the surrounding birds are clearly identifiable and depicted with appropriate colouring. It is believed to be from the 17th century and has been attributed to artist Ustad Mansur. The bird depicted probably lived in the menagerie of Mughal Emperor Jahangir, located in Surat, where English traveller Peter Mundy also claimed to have seen Dodos.

Behaviour and ecology

Little is known of the behaviour of the Dodo, as most contemporary descriptions are very brief. Studies of the cantilever strength of its leg bones indicate that it could run quite fast. As it was flightless and terrestrial and there were no mammalian predators or other kinds of natural enemy on Mauritius, it probably nested on the ground. The account by François Cauche from 1651 is the only description of the egg and the call:

I have seen in Mauritius birds bigger than a Swan, without feathers on the body, which is covered with a black down; the hinder part is round, the rump adorned with curled feathers as many in number as the bird is years old. In place of wings they have feathers like these last, black and curved, without webs. They have no tongues, the beak is large, curving a little downwards; their legs are long, scaly, with only three toes on each foot. It has a cry like a gosling, and is by no means so savoury to eat as the Flamingos and Ducks of which we have just spoken. They only lay one egg which is white, the size of a halfpenny roll, by the side of which they place a white stone the size of a hen's egg. They lay on grass which they collect, and make their nests in the forests; if one kills the young one, a grey stone is found in the gizzard. We call them Oiseaux de Nazaret. The fat is excellent to give ease to the muscles and nerves.[10]

Cauche's account is problematic, since it also mentions that the bird he was describing had three toes and no tongue, unlike Dodos. This led some to believe that Cauche was describing a new species of Dodo ("Didus nazareus"). The description was most probably mingled with that of a cassowary, and Cauche's writings have other inconsistencies. A mention of a "young ostrich" taken on board a ship in 1617 is the only other reference to a possible juvenile Dodo.

Because of the single-egg clutch and the bird's large size, it has been proposed that the Dodo was K-selected, meaning that it produced a low number of altricial offspring, which required parental care until they matured. Some evidence, including the large size and the fact that tropical and frugivorous birds have slower growth rates, indicates that the bird may have had a protracted development period.

The preferred habitat of the Dodo is unknown, but old descriptions suggest that it inhabited the woods on the drier coastal areas of south and west Mauritius. This view is supported by the fact that the Mare aux Songes swamp, where most Dodo remains have been found, is close to the sea in south-eastern Mauritius. Such a limited distribution across the island could well have contributed to its extinction. A 1601 map from the Gelderland journal shows a small island off the coast of Mauritius where Dodos were caught. It has been suggested this island was in Tamarin Bay, on the west coast of Mauritius. Subfossil bones have also been found inside caves in highland areas, indicating that it once occurred on mountains. Work at the Mare aux Songes swamp has shown that its habitat was dominated by tambalacoque and Pandanus trees and endemic palms.

Many endemic species of Mauritius became extinct after the arrival of humans, so the ecosystem of the island is badly damaged and hard to reconstruct. Before humans arrived, Mauritius was entirely covered in forests, but very little remains of them today, because of deforestation. The surviving endemic fauna is still seriously threatened. The Dodo lived alongside other recently extinct Mauritian birds such as the flightless Red Rail, the Broad-billed Parrot, Thirioux's Grey Parrot, the Mauritius Blue Pigeon, the Mauritius Owl, the Mascarene Coot, the Mauritian Shelduck, the Mauritian Duck, and the Mauritius Night Heron. Extinct Mauritian reptiles include the Saddle-backed Mauritius giant tortoise, the Domed Mauritius giant tortoise, the Mauritian Giant Skink, and the Round Island Burrowing Boa. The Small Mauritian Flying Fox and the snail *Tropidophora carinata* lived on Mauritius and Réunion, but vanished from both islands. Some plants, such as *Casearia tinifolia* and the Palm Orchid, have also become extinct.

Diet

A 1631 Dutch document, rediscovered in 1887 but now lost, is the only account of the Dodo's diet and also mentions that it used its beak for defence: These mayors are superb and proud. They displayed themselves to us with stiff and stern faces, and wide-open mouths. Jaunty and audacious of gait, they would scarcely move a foot before us. Their war weapon was their mouth, with which they could bite fiercely; their food was fruit; they were not well feathered but abundantly covered with fat. Many of them were brought onboard to the delight of us all.

In addition to fallen fruits, the Dodo probably subsisted on nuts, seeds, bulbs, and roots. Anthonie Oudemans suggested that as Mauritius has marked dry and wet seasons, the Dodo probably fattened itself on ripe fruits at the end of the wet season to survive the dry season, when food was scarce; contemporary reports describe the bird's "greedy" appetite. France Staub suggested that they mainly fed on palm fruits, and he attempted to correlate the fat-cycle of the Dodo with the fruiting regime of the palms. It has also been suggested that the Dodo might have eaten crabs and shellfish, like their relatives the Crowned Pigeons. Its feeding habits must have been versatile, since captive specimens were probably given a wide range of food on the long sea journeys.

Several contemporary sources state that the Dodo used gizzard stones to aid digestion. The English writer Sir Hamon L'Estrange witnessed a live bird in London and described it as follows:

About 1638, as I walked London streets, I saw the picture of a strange looking fowle hung out upon a clothe and myselfe with one or two more in company went in to see it. It was kept in a chamber, and was a great fowle somewhat bigger than the largest Turkey cock, and so legged and footed, but stouter and thicker and of more erect shape, coloured before like the breast of a young cock fesan, and on the back of a dunn or dearc colour. The keeper called it a Dodo, and in the ende of a chymney in the chamber there lay a heape of large pebble stones, whereof hee gave it many in our sight, some as big as nutmegs, and the keeper told us that she eats them (conducing to digestion), and though I remember not how far the keeper was questioned therein, yet I am confident that afterwards she cast them all again.

It is not known how the young were fed, but related pigeons provide crop milk.

Contemporary depictions show a large crop, which was probably used to add space for food storage and to produce crop milk. It has been suggested that the maximum size attained by the Dodo and the Solitaire was limited by the amount of crop milk they could produce for their young during early growth.

In 1973, the tambalacoque, also known as the "Dodo tree", was thought to be dying out on Mauritius, to which it is endemic. There were supposedly only 13 specimens left, all estimated to be about 300 years old. Stanley Temple hypothesised that it depended on the Dodo for its propagation, and that its seeds would germinate only after passing through the bird's digestive tract. He claimed that the tambalacoque was now nearly coextinct because of the disappearance of the Dodo. Temple overlooked reports from the 1940s that found that tambalacoque seeds germinated, albeit very rarely, without being abraded during digestion. Others have contested his hypothesis and suggested that the decline of the tree was exaggerated, or seeds were also distributed by other extinct animals such as *Cylindraspis* tortoises, fruit bats or the Broad-billed Parrot. According to Wendy Strahm and Anthony Cheke, two experts in the ecology of the Mascarene Islands, the tree, while rare, has germinated since the demise of the Dodo and numbers several hundred, not 13 as claimed by Temple, hence discrediting Temple's view as to the Dodo and the tree's sole survival relationship.

It has also been suggested that the Broad-Billed Parrot may have depended on Dodos and *Cylindraspis* tortoises to eat palm fruits and excrete their seeds, which became food for the parrots. *Anodorhynchus* macaws depended on now-extinct South American megafauna in the same way, but now rely on domesticated cattle for this service.

Relationship with humans

Mauritius had previously been visited by Arab vessels in the Middle Ages and Portuguese ships between 1507 and 1513, but was settled by neither. No records of Dodos by these are known, although the Portuguese name for Mauritius, "Cerne (swan) Island", may have been a reference to Dodos. The Dutch Empire acquired Mauritius in 1598, renaming it after Maurice of Nassau, and it was used for the provisioning of trade vessels of the Dutch East India Company henceforward. The earliest known descriptions of the Dodo were provided by Dutch travellers during the Second Dutch Expedition to Indonesia, led by Admiral Jacob van Neck in 1598. They appear in reports published in 1601, which also contain the first published illustration of the bird. Since the first sailors to visit Mauritius had been at sea for a long time, their interest in these large birds was mainly culinary. Although later writings describe the meat as unsavoury, early journals state that it was tough but good. The 1602 journal by Willem Van West-Zanen of the ship *Bruin-Vis* mentions that 24-25 Dodos were hunted for food, which were so large that two could scarcely be consumed at mealtime, their remains being preserved by salting. An illustration made for the 1648 published version of this journal, showing the killing of Dodos, a dugong, and possibly a Thirioux's Grey Parrot, was captioned with a Dutch poem, here in Hugh Strickland's translation:

For food the seamen hunt the flesh of feathered fowl,
They tap the palms, and round-rumped dodos they destroy,
The parrot's life they spare that he may peep and howl,
And thus his fellows to imprisonment decoy.

The appearance of the Dodo and the Red Rail led Peter Mundy to speculate, 230 years before Charles Darwin's theory of evolution:

Of these 2 sorts off fowl afforementioned, For oughtt wee yett know, Not any to bee Found out of this Iland, which lyeth aboutt 100 leagues From St. Lawrence. A question may bee demaunded how they should bee here and Not elcewhere, beeing soe Farer From other land and can Neither fly or swymme; whither by Mixture off kindes producing straunge and Monstrous formes, or the Nature of the Climate, ayer and earth in alltring the First shapes in long tyme, or how.

Dodos transported abroad

The Dodo was found interesting enough that living specimens were sent to

Europe and the East. The number of transported Dodos that reached their destinations alive is uncertain, and it is unknown how they relate to contemporary depictions and the few non-fossil remains in European museums. Hamon L'Estrange's description of a Dodo that he saw in London in 1638 is the only account that specifically mentions a live specimen in Europe. In 1626 Adriaen van de Venne drew a Dodo that he claimed to have seen in Amsterdam, but he did not mention if it was alive, and his depiction is reminiscent of Savery's Edwards' Dodo. Two live specimens were seen by Peter Mundy in Surat, India, between 1628 and 1634, one of which may have been the individual painted by Ustad Mansur around 1625. One Dodo was sent as far as Nagasaki, Japan in 1647, but it is unknown whether it arrived. In 1628, Emmanuel Altham visited Mauritius and sent a letter to his brother in England:

Right wo and lovinge brother,

We were ordered by ye said councell to go to an island called Mauritius, lying in 20d. of south latt., where we arrived ye 28th of May; this island having many goates, hogs and coves upon it, and very strange fowles, called by ye portingalls Dodo, which for the rareness of the same, the like being not in ye world but here, I have sent you one by Mr. Perce, who did arrive with the ship William at this island ye 10th of June.

[In the margin of the letter] Of Mr. Perce you shall receive a jarr of ginger for my sister, some beades for my cousins your daughters, and a bird called a Dodo, if it live.

Whether the Dodo survived the journey is unknown, and the letter was destroyed by fire in the 19th century.

The earliest known picture of a Dodo specimen in Europe is from a ca. 1610 collection of paintings depicting animals in the royal menagerie of Emperor Rudolph II in Prague. This collection includes paintings of other Mauritian animals as well, including a Red Rail. The Dodo, which may be a juvenile, seems to have been dried or embalmed, and had probably lived in the emperor's zoo for a while together with the other animals. That whole stuffed Dodos were present in Europe indicates they had been brought alive and died there; it is unlikely that taxidermists were on board the visiting ships, and spirits were not yet used to preserve biological specimens. Most tropical specimens were preserved as dried heads and feet. Based on a combination of contemporary accounts, paintings, and specimens, Julian Hume has inferred that at least eleven transported Dodos reached their destinations alive.

Extinction

Like many animals that evolved in isolation from significant predators, the Dodo was entirely fearless of humans. This fearlessness and its inability to fly made the Dodo easy prey for sailors. Although some scattered reports describe mass killings of Dodos for ships' provisions, archaeological investigations have found scant evidence of human predation. Bones of at least two Dodos were found in caves at Baie du Cap that sheltered fugitive slaves and convicts in the 17th century and would not have been easily accessible to Dodos because of the high, broken terrain. The human population on Mauritius (an area of 1,860 km² or 720 sq mi) never exceeded 50 people in the 17th century, but they introduced other animals, including dogs, pigs, cats, rats, and crab-eating macaques, which plundered Dodo nests and competed for the limited food resources. At the same time, humans destroyed the Dodo's forest habitat. The impact of these introduced animals, especially the pigs and macaques, on the Dodo population is currently considered more severe than that of hunting. Rats were perhaps not much of a threat to the nests, since Dodos would have been used to dealing with local land crabs.

It has been suggested that the Dodo may already have been rare or localised before the arrival of humans on Mauritius, since it would have been unlikely to become extinct so rapidly if it had occupied all the remote areas of the island. A 2005 expedition found subfossil remains of Dodos and other animals killed by a flash flood. Such mass mortalities would have further jeopardised a species already in danger of becoming extinct.

Some controversy surrounds the date of their extinction. The last widely

accepted record of a Dodo sighting is the 1662 report by shipwrecked mariner Volkert Evertsz of the Dutch ship *Arnhem*, who described birds caught on a small islet off Mauritius, now suggested to be Amber Island:

These animals on our coming up to them stared at us and remained quiet where they stand, not knowing whether they had wings to fly away or legs to run off, and suffering us to approach them as close as we pleased. Amongst these birds were those which in India they call Dod-aersen (being a kind of very big goose); these birds are unable to fly, and instead of wings, they merely have a few small pins, yet they can run very swiftly. We drove them together into one place in such a manner that we could catch them with our hands, and when we held one of them by its leg, and that upon this it made a great noise, the others all on a sudden came running as fast as they could to its assistance, and by which they were caught and made prisoners also.

The last claimed sighting of a Dodo was reported in the hunting records of Isaac Johannes Lamotius in 1688. Statistical analysis of these records by Roberts and Solow gives a new estimated extinction date of 1693, with a 95% confidence interval of 1688â[^]1715. The authors also pointed out that because the last sighting before 1662 was in 1638, the Dodo was probably already quite rare by the 1660s, and thus a disputed report from 1674 by an escaped slave cannot be dismissed out of hand.

Anthony Cheke pointed out that some descriptions after 1662 use the names "Dodo" and "Dodaers" when referring to the Red Rail, indicating that they had been transferred to it after the disappearance of the Dodo itself. Cheke therefore points to the 1662 description as the last credible observation. Until this explanation was proposed, a description of "Dodos" from 1681 was thought to be the last account. A 1668 account by English traveller John Marshall, who used the names "Dodo" and "Red Hen" interchangeably for the Red Rail, mentioned that the meat was "hard", which echoes the description of the meat in the 1681 account. Even the 1662 account has been questioned by Errol Fuller, as the reaction to distress cries matches what was described for the Red Rail. The IUCN Red List accepts Cheke's rationale for choosing the 1662 date, taking all subsequent reports to refer to Red Rails. In any case, the Dodo was probably extinct by 1700, about a century after its discovery in 1598. The Dutch left Mauritius in 1710, but by then the Dodo and most of the large terrestrial vertebrates there had become extinct.

Even though the rareness of the Dodo was reported already in the 17th century, its extinction was not recognised until the 19th century. This was partly because, for religious reasons, extinction was not believed possible until later proved so by Georges Cuvier, and partly because many scientists doubted that the Dodo had ever existed. It seemed altogether too strange a creature, and many believed it a myth. The bird was first used as an example of human-induced extinction in *Penny Magazine* in 1833.

Physical remains

17th century specimens

The only extant remains of Dodos taken to Europe in the 17th century are a dried head and foot in the Oxford University Museum of Natural History, a foot once housed in the British Museum but now lost, a skull in the University of Copenhagen Zoological Museum, and an upper jaw and leg bones in the National Museum, Prague. The last two were rediscovered and identified as Dodo remains in the mid-19th century. Other stuffed Dodos were mentioned in old museum inventories, but none are known to have survived.

The only known soft tissue remains, the Oxford head (specimen OUM 11605) and foot, belonged to the last known stuffed Dodo, which was first mentioned as part of the Tradescant collection in 1656 and was moved to the Ashmolean Museum in 1659. It has been suggested that this might be the remains of the bird that Hamon L'Estrange saw in London. Many sources state that the museum burned the stuffed Dodo around 1755 because of severe decay, saving only the head and leg. Statute 8 of the museum states "That as any particular grows old and perishing the keeper may remove it into one of the closets or other repository; and some other to be substituted." The deliberate destruction of the specimen is now

believed to be a myth. It was removed from exhibition to preserve what remained of it. This remaining soft tissue has since degraded further; the head was dissected by Strickland and Melville, separating the skin from the skull in two halves. The foot is in a skeletal state, with only scraps of skin and tendons. Very few feathers remain on the head. It is probably a female, as the foot is 11% smaller and more gracile than that of the London specimen, yet appears to be fully grown.

The dried London foot, first mentioned in 1665, was long displayed in the British Museum next to Savery's Edwards' Dodo painting, and it too was dissected by Strickland and Melville. By 1896 it was mentioned as being without its integuments, and only the bones are believed to remain today. Its present whereabouts are unknown.

The Copenhagen skull (specimen ZMUC 90-806) is known to have been part of the collection of Bernardus Paludanus in Enkhuizen until 1651, when it was moved to the museum in Gottorf Castle, Schleswig. After the castle was occupied by Danish forces in 1702, the museum collection was assimilated into the Royal Danish collection. The skull was rediscovered by J. T. Reinhardt in 1840. It is 13 mm shorter than the Oxford skull, and may have belonged to a female. It was mummified, but the skin has perished. Its sclerotic ring is preserved.

The front part of a skull (specimen NMP P6V-004389) and some leg bones in the National Museum of Prague were found in 1850 among the remains of the Břevnovské Museum. It may be what remains of one of the stuffed Dodos known to have been at the menagerie of Emperor Rudolph II, possibly the specimen painted by Hoefnagel or Savery there.

Apart from these remains, a dried foot was mentioned by Carolus Clusius in 1605, but is now lost. It belonged to the Dutch professor Pieter Pauw, and its provenance is unknown. It may have been collected during the Van Neck voyage.

Subfossil specimens

Until 1860, the only known Dodo remains were the four incomplete 17th-century specimens. Philip Burnard Ayres found the first subfossil bones, which were sent to Richard Owen at the British Museum, who did not publish the findings. In 1863, Owen requested the Mauritian Bishop Vincent Ryan to spread word that he should be informed if any Dodo bones were found. In 1865, George Clark, the government schoolmaster at MahÃ©bourg, finally found an abundance of subfossil Dodo bones in the swamp of Mare aux Songes in Southern Mauritius, after a 30-year search inspired by Strickland and Melville's monograph. In 1866, Clark explained his procedure to *The Ibis*, an ornithology journal: he had sent his coolies to wade through the centre of the swamp, feeling for bones with their feet. At first they found few bones, until they cut away herbage that covered the deepest part of the swamp, where they found many fossils. The swamp yielded the remains of over 300 Dodos, but very few skull and wing bones, possibly because the upper bodies were washed away or scavenged while the lower body was trapped. The situation is similar to many finds of Moa remains in New Zealand marshes.

Clark's reports about the finds rekindled interest in the bird. Sir Richard Owen and Alfred Newton both wanted to be first to describe the post-cranial anatomy of the Dodo, and Owen bought a shipment of Dodo bones originally meant for Newton, which led to rivalry between the two. Owen described the bones in *Memoir on the Dodo* in October 1866, but erroneously based his reconstruction on the Edwards' Dodo painting by Savery, making it too squat and obese. In 1869 he received more bones and corrected its stance, making it more upright. Newton moved his focus to the *RÃ©union Solitaire* instead. The remaining bones not sold to Owen or Newton were auctioned off or donated to museums.

In 1889, ThÃ©odor Sauzier was commissioned to explore the "historical souvenirs" of Mauritius and find more Dodo remains in the Mare aux Songes. He was successful, and also found remains of other extinct species. A barber named Louis Etienne Thirioux also found many Dodo remains around 1900, which are now lost. They included the first remains of a juvenile and the first articulated specimen. It is unknown exactly where he made his finds, except that some were found in a cave, which may have been located on the slopes of Le Pouce

mountain.

Worldwide, 26 museums have significant holdings of Dodo material, almost all found in the Mare aux Songes. The Natural History Museum, American Museum of Natural History, Cambridge University Museum of Zoology, the Senckenberg Museum, and others have almost complete specimens assembled from these dissociated subfossil remains. An egg claimed to be that of a Dodo is stored in the museum of East London, South Africa. It was donated by Marjorie Courtenay-Latimer, whose great aunt had received it from a captain who claimed to have found it in a swamp on Mauritius. In 2010, the curator of the museum proposed using genetic studies to determine its authenticity. It may instead be an aberrant ostrich egg.

In October 2005, after a hundred years of neglect, a part of the Mare aux Songes swamp was excavated by an international team of researchers. To prevent malaria, the British had covered the swamp with hard core during their rule over Mauritius, which had to be removed. Many remains were found, including bones of at least 17 Dodos in various stages of maturity (though no juveniles), and several bones obviously from the skeleton of one individual bird, which have been preserved in their natural position. These findings were made public in December 2005 in the Naturalis museum in Leiden. 63% of the fossils found in the swamp belonged to turtles of the extinct *Cylindraspis* genus, and 7.1% belonged to Dodos, which had been deposited within several centuries, 4,000 years ago. Subsequent excavations suggested that Dodos and other animals became mired in the Mare aux Songes while trying to reach water during a long period of severe drought about 4,200 years ago.

In June 2007, adventurers exploring a cave in Mauritius discovered the most complete and best-preserved Dodo skeleton ever found. The specimen was nicknamed "Fred" after the finder. In 2011, a wooden box containing Dodo bones from the Edwardian era was rediscovered at the Grant Museum at University College London during preparations for a move.

The White Dodo

The supposed "White Dodo" (or "Solitaire") of Réunion is now considered an erroneous conjecture based on contemporary reports of the Réunion Ibis and 17th-century paintings of white, Dodo-like birds by Pieter Withoos and Pieter Holsteyn that surfaced in the 19th century. The confusion began when Willem Ysbrandtszoon Bontekoe, who visited Réunion around 1619, mentioned fat, flightless birds that he referred to as "Dod-eersen" in his journal, though without mentioning their colouration. When the journal was published in 1646, it was accompanied by a copy of Savery's "Crocker Art Gallery sketch". A white, stocky, and flightless bird was first mentioned as part of the Réunion fauna by Chief Officer J. Tatton in 1625. Sporadic mentions were subsequently made by Sieur Dubois and other contemporary writers.

Baron Edmund de SÃ@lys-Longchamps coined the name *Raphus solitarius* for these birds in 1848, as he believed the accounts referred to a species of Dodo. When 17th-century paintings of white Dodos were discovered by 19th century naturalists, it was assumed they depicted these birds. Anthonie Cornelis Oudemans suggested that the discrepancy between the paintings and the old descriptions was that the paintings showed females, and that the species was therefore sexually dimorphic. Some authors also believed the birds described were of a species similar to the Rodrigues Solitaire, as it was referred to by the same name, or even that there were white species of both Dodo and Solitaire on the island.

The Pieter Withoos painting, which was discovered first, appears to be based on an earlier painting by Pieter Holsteyn, three versions of which are known to have existed. According to Hume, Cheke, and Valledor de Lozoya, it appears that all depictions of white Dodos were based on Roelant Savery's 1611 painting *Landscape with Orpheus and the animals*, or on copies of it. The painting shows a whitish specimen and was apparently based on a stuffed specimen then in Prague; a walghvogel described as having a "dirty off-white colouring" was mentioned in an inventory of specimens in the Prague collection of the Holy Roman Emperor Rudolf II, to whom Savery was contracted at the time (1607â ^1611).

Savery's several later images all show greyish birds, possibly because he had by then seen another specimen. Cheke and Hume believe the painted specimen was white due to albinism. Valledor de Lozoya has instead suggested that the light plumage was a juvenile trait, a result of bleaching of old taxidermy specimens, or simply artistic license.

In 1987, scientists described fossils of a recently extinct species of ibis from Réunion with a relatively short beak, *Borbonibis latipes*, before a connection to the Solitaire reports had been made. Cheke suggested to one of the authors, Francois Moutou, that the fossils may have been of the Réunion Solitaire, and this suggestion was published in 1995. The ibis was reassigned to the genus *Threskiornis*, now combined with the specific epithet *solitarius* from the binomial *R. solitarius*. Birds of this genus are also white and black with slender beaks, fitting the old descriptions of the Réunion Solitaire. No fossil remains of Dodo-like birds have ever been found on the island.

Cultural significance

The Dodo's significance as one of the best-known extinct animals and its singular appearance led to its use in literature and popular culture as a symbol of an outdated concept or object, as in the expression "dead as a Dodo," which has come to mean unquestionably dead or obsolete. Similarly, the phrase "to go the way of the Dodo" means to become extinct or obsolete, to fall out of common usage or practice, or to become a thing of the past. In 1865, the same year that George Clark started to publish reports about excavated Dodo fossils, the newly vindicated bird was featured as a character in Lewis Carroll's *Alice's Adventures in Wonderland*. It is thought that he included the Dodo because he identified with it and had adopted the name as a nickname for himself because of his stammer, which made him accidentally introduce himself as "Do-do-dodgson", his legal surname. The book's popularity made the Dodo a well-known icon of extinction.

Today, the Dodo appears frequently in works of popular fiction and is used as a mascot for many kinds of products, especially in Mauritius. The Dodo appears as a supporter on the coat of arms of Mauritius. It is also used as a watermark on all Mauritian rupee banknote. A smiling Dodo is the symbol of the Brasseries de Bourbon, a popular brewer on Réunion, whose emblem displays the white species once thought to have lived there.

The Dodo is used to promote the protection of endangered species by many environmental organisations, such as the Durrell Wildlife Conservation Trust and the Durrell Wildlife Park. In 2011, the nephilid spider *Nephilengys dodo*, which inhabits the same woods as the Dodo once did, was named after the bird to raise awareness of the urgent need for protection of the Mauritius biota. The name Dodo has also been immortalized by scientists naming genetic elements, honoring the Dodo's flightless nature. A fruitfly gene within a region of a chromosome required for flying ability was named "dodo". In addition, a defective transposable element family from *Phytophthora infestans* was named "dodo" as it contained mutations that eliminated the element's ability to jump to new locations in a chromosome.

In 2009, a previously unpublished 17th-century Dutch illustration of a Dodo went for sale at Christie's and was expected to sell for £6,000. It is unknown whether the illustration was based on a specimen or on a previous image. It sold for £44,450.

The poet Hilaire Belloc included the following poem about the Dodo in his *Bad Child's Book of Beasts* from 1896:

The Dodo used to walk around,
And take the sun and air.
The sun yet warms his native ground ^
The Dodo is not there!
The voice which used to squawk and squeak
Is now for ever dumb ^
Yet may you see his bones and beak
All in the Mu-se-um.

See also
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Footnotes
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External links

Euryoryzomys emmonsae, also known as Emmons's Rice Rat[1] or Emmons' Oryzomys,[5] is a rodent from Amazonian Brazil in the genus *Euryoryzomys* of the family Cricetidae. Initially misidentified as *E.Â macconnelli* or *E.Â nitidus*, it was formally described in 1998. A rainforest species, it may be scansorial, climbing but also spending time on the ground. It occurs only in a limited area south of the Amazon River in the state of Par , a distribution that is apparently unique among the muroid rodents of the region.

Euryoryzomys emmonsae is a relatively large rice rat, weighing 46 to 78Â g (1.6 to 2.8Â oz), with a distinctly long tail and relatively long, tawny brown fur. The skull is slender and the incisive foramina (openings in the bone of the palate) are broad. The animal has 80 chromosomes and its karyotype is similar to that of other *Euryoryzomys*. Its conservation status is assessed as "Data Deficient", but deforestation may pose a threat to this species.

[edit] Taxonomy

In 1998, Guy Musser, Michael Carleton, Eric Brothers, and Alfred Gardner reviewed the taxonomy of species previously lumped under "*Oryzomys capito*" (now classified in the genera *Hylaeamys*, *Euryoryzomys*, and *Transandinomys*). They described the new species *Oryzomys emmonsae* on the basis of 17 specimens from three locations in the state of Par  in northern Brazil; these animals had been previously identified as *Oryzomys macconnelli* (now *Euryoryzomys macconnelli*) and then as *Oryzomys nitidus* (now *Euryoryzomys nitidus*).[3] The specific name honors Louise H. Emmons, who, among other contributions to Neotropical mammalogy, collected three of the known examples of the species in 1986, including the holotype.[6] The new species was placed in what they termed the "*Oryzomys nitidus* group", which also included *O.Â macconnelli*, *O.Â nitidus*, and *O.Â*

russatus.[7]

In 2000, James Patton, Maria da Silva, and Jay Malcolm reported on mammals collected at the Rio Juruá; in western Brazil. In this report, they provided further information on the *Oryzomys* species reviewed by Musser and colleagues, including sequence data from the mitochondrial cytochrome b gene. Their analysis reaffirmed that *O. emmonsae* was a distinct species and found that it was closest to *O. macconnelli* and *O. russatus*, differing from both by about 12% in the cytochrome b sequence; *O. nitidus* was more distantly related, differing by 14.7%. The average sequence difference between the three *O. emmonsae* studied was 0.8%.[8]

In 2006, an extensive morphological and molecular phylogenetic analysis by Marcelo Weksler showed that species then placed in the genus *Oryzomys* did not form a single, cohesive (monophyletic) group; for example, *O. macconnelli*, *O. lamia* (placed under *O. russatus* by Musser and colleagues) and *O. russatus* clustered together in a single natural group (clade), but were not closely related to the type species of *Oryzomys*, the marsh rice rat (*O. palustris*).[9] Later in 2006, Weksler and colleagues described several new genera to accommodate species previously placed in *Oryzomys*, among which was *Euryoryzomys* for the "*O. nitidus* complex", including *O. emmonsae*. [4]

Thus, the species is now known as *Euryoryzomys emmonsae*. [1] As a species of *Euryoryzomys*, it is classified within the tribe *Oryzomyini* ("rice rats"), which includes over a hundred species, mainly from South and Central America. [10] *Oryzomyini* in turn is part of the subfamily *Sigmodontinae* of family *Cricetidae*, along with hundreds of other species of mainly small rodents. [11]

[edit] Description

Euryoryzomys emmonsae is a fairly large, [12] long-tailed rice rat with long, soft fur. The hairs on the back are 8 to 10 mm (0.3 to 0.4 in) long. [13] It generally resembles *E. nitidus* in these and other characters, but has a longer tail. [3] *E. macconnelli* is slightly larger and has longer and duller fur. In *E. emmonsae*, the upperparts are tawny brown, but a bit darker on the head because many hairs have black tips. The hairs of the underparts are gray at the bases and white at the tips; overall, the fur appears mostly white. In most specimens, there is a patch on the chest where the gray bases are absent. The longest of the vibrissae (whiskers) of the face extend slightly beyond the ears. The eyelids are black. The ears are covered with small, yellowish brown hairs and appear dark brown overall. The feet are covered with white hairs above and brown below. There are six pads on the plantar surface, but the hypothenar is reduced. The ungual tufts, tufts of hair which surround the bases of the claws, are well-developed. The tail is like the body in color above, and mostly white below, but in the 10 mm (0.4 in) nearest the tail tip it is brown below. [13]

Compared to *E. nitidus* [3] and *E. macconnelli*, the skull is relatively small and slender. It has broad and short incisive foramina (perforations of the palate between the incisors and the molars) and lacks sphenopalatine vacuities which perforate the mesopterygoid fossa, the gap behind the end of the palate. The animal is similar to other members of the genus in the pattern of the arteries of the head. [13] The alisphenoid strut, an extension of the alisphenoid bone which separates two foramina (openings) in the skull (the masticatory-buccinator foramen and the foramen ovale accessorius) is rarely present; its presence is more frequent in *E. nitidus*. [14] The capsular process, a raising of the bone of the mandible (lower jaw) behind the third molar, houses the back end of the lower incisor in most *Euryoryzomys*, but is absent in *E. emmonsae* and *E. macconnelli*. [15] Traits of the teeth are similar to those of *E. nitidus* and other *Euryoryzomys*. [16]

The karyotype includes 80 chromosomes with a total of 86 major arms ($2n = 80$; $FN = 86$). The X chromosome is subtelocentric (with one pair of long arms and one pair of short arms) and the Y chromosome is acrocentric (with only one pair of arms, or with a minute second pair). Among the autosomes (non-sex chromosomes), the four metacentric or submetacentric (with two pairs of arms as long as or not much shorter than the other) pairs of chromosomes are small, and

the 35 pairs of acrocentrics range from large to small. Some of those have a minute second pair of arms and could also be classified as subtelocentric, which would raise FN to 90. This karyotype is similar to other known karyotypes of members of *Euryoryzomys*. [13]

In thirteen specimens measured by Musser, head and body length ranges from 120 to 142 mm (4.7 to 5.6 in), tail length (12 specimens only) from 130 to 160 mm (5.1 to 6.3 in), hindfoot length from 32 to 35 mm (1.3 to 1.4 in), ear length (three specimens only) from 23 to 24 mm (0.91 to 0.94 in), and body mass from 46 to 78 g (1.6 to 2.8 oz). [17]

[edit] Distribution and ecology

The known distribution of *Euryoryzomys emmonsae* is limited to a portion of the Amazon Rainforest south of the Amazon River in the state of Pará, between the Xingu and Tocantins rivers, but the limits of its range remain inadequately known. [18] No other South American rainforest muroid rodent is known to have a similar distribution. [19] Musser and colleagues reported it from three locations and Patton and others added a fourth; in some of those it occurs together with *E. macconnelli* or *Hylaeamys megacephalus*. [20]

Specimens of *E. emmonsae* for which detailed habitat data are available were caught in "viny forest", a microhabitat that often included much bamboo. All were captured on the ground, some in bamboo thickets and another under a log. [21] Musser and colleagues speculated that *E. emmonsae* may be scansorial, spending time both on the ground and climbing in vegetation, like the similarly long-tailed rice rat *Cerradomys subflavus*. [22]

[edit] Conservation status

The IUCN currently lists *Euryoryzomys emmonsae* as "Data Deficient" because it is so poorly known. It may be threatened by deforestation and logging, but occurs in at least one protected area, the Floresta Nacional de Tapirape-Aquiri. [1]

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- ^ a b c d Musser et al., 1998, p. 233
- ^ a b Weksler et al., 2006, p. 11
- ^ Musser and Carleton, 2005, p. 1148
- ^ Musser et al., 1998, pp. 233, 239
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- ^ Patton et al., 2000, fig. 99; table 37
- ^ Weksler, 2006, figs. 34-39
- ^ Weksler et al., 2006, table 1; Musser and Carleton, 2005
- ^ Musser and Carleton, 2005
- ^ Musser et al., 1998, pp. 233-234
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- ^ Musser et al., 1998, p. 236
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- ^ Musser et al., 1998, pp. 234; Weksler et al., 2006, p. 12
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- ^ Musser et al., 1998, p. 236; Musser and Carleton, 2005, p. 1148
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- ^ Musser et al., 1998, pp. 232, 237; Patton et al., 2000, p. 146
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Wikipedians are people who write and edit the pages for Wikipedia, unlike readers who simply read the articles. Anyone can be a Wikipedian—including you. Just click the edit link at the top of any page, or at the beginning of each section. Visit the editing tutorial to learn more. You can browse or search the full user list, or request a random Wikipedian's user page.

[edit] Number of editors

Gender

According to the worldwide Wikipedia Editor Survey 2011 of all the Wikipedias, 91% of editors are male. However, the number of women editors is on the rise.

Editing language

Predictably, most of the editors primarily edit (76%) and read (49%) the English Wikipedia, followed by the German Wikipedia as 20% and 12%, and Spanish Wikipedia as 12% and 6% respectively. More than half (51%) the editors contribute in two or more languages.

Age distribution

59% of the editors are aged 17 to 40, more specifically, 14% of the editors are in the group 18-21, 13% are 22-29, and 19% are 30-39. 28% editors are aged 40+, whereas 13% are aged 17 and under.

Editing activities

66% of editors said that their primary activity is to edit existing articles, 42% said it was researching articles and 28% creating new articles. 23% said that they do mostly patrolling work, 22% participate primarily in discussions and 17% mainly upload media.

Why contribute?

71% of the editors contribute because they like the idea of volunteering to share knowledge. 69% believe that information should be freely available, and 63% pointed that contributing is fun. 7% edit Wikipedia for professional reasons.

The number of named accounts is currently 18,401,074.[1] Only a minority of account holders are regular contributors, and only a minority of those users interact in discussions about the community. An unknown but relatively large number of unregistered Wikipedians also contribute to the site.

[edit] User status

Based on user rights, there are the following user groups[2]: [Purge]

Administrators: 1,451

Account creators: 158

Autopatrollers: 2,868

Bots: 732

Bureaucrats: 35

Checkusers: 40

Confirmed users: 288

Edit filter managers: 161

File movers: 333

Founders: 1

Importers: 1
IP block exemptions: 412
Oversighters: 38
Researchers: 8
Reviewers: 5,753
Rollbackers: 4,780
Stewards: 0
Transwiki importers: 0

It should be noted that some user groups (such as stewards) act globally and thus they do not get local flags and local rights.

[edit] Editing patterns

The highest number of unique users making at least one edit during any given month was in March 2007.[3] Since then, the number of active users declined and has now largely plateaued. For example, in December 2010, 34,048 users made more than five edits during the month and 3,478 made more than 100 edits during the month; in December 2011, 33,948 users made more than five edits during the month and 3,489 made more than 100 edits during the month.[4]

There is a definite seasonal pattern to editor activity, with more editors active during the North American school year than during its summer break.

About 250,000 new accounts are created every month. About 300,000 editors have edited Wikipedia more than 10 times. 134,269 have performed an edit within the last 30 days.[5]

The Wikipedians with the 5,000 highest edit counts are listed here.

[edit] Demographics

Based on a survey of over 58,000 self-selected Wikipedians by a group at UNU-Merit published in March 2010, contributors can be split into four approximately equal age-groups: those under 18, those between 18 and 22, those from 22 to 30 and the remainder between 30 and 85.[6] About 23% of contributors have completed degree-level education, 26% are undergraduates and 45% have secondary education or less. 87% are men and 13% women. The survey included users of 22 language editions in 231 countries.[6]

Various information about individual Wikipedians is available on the user pages of Wikipedians who choose to create them.

[edit] Personality

Researchers around the world have begun to identify key personality traits in Wikipedians. According to a study published in 2008, Wikipedia members are more likely than non-members to locate their 'real me' onlineâ ~that is, to feel more comfortable expressing their "real" selves online than off.[7] This corresponds with more general findings that Internet communities tend to attract users who are introverted offline but more able to open up and feel empowered on the Web.[8][9] A gender difference was found in terms of extroversion: whereas female Wikipedia members were on average more introverted than female non-members, male members were just as extroverted as males in the control group. Wikipedians have also been found to be less agreeable, and less open, as defined by psychologyâ s Big Five personality traits.[7]

[edit] Motivations for contributing

A 2010 study found that although members may initially contribute to the site for pleasure, they are motivated primarily by an internal drive to feel efficacious and self-confident. Aside from potentially fueling a first-time contribution, enjoyment was found to have no significant impact on knowledge-sharing behavior in Wikipedia. It was found that Wikipedians are not primarily motivated by recognition or reputation.[10]

[edit] Nomenclature

It has been suggested that Wikipedist would be a more appropriate name, as an encyclopedist is someone who contributes to an encyclopedia. "Wikipedian", though, suggests being part of a group, community or demonym. So in this sense, Wikipedians are people who form The Wikipedia Community. The term "Wikimedian" is also widely used to include contributors to all the projects of the Wikimedia Foundation.

[edit] Contribution styles

Some Wikipedians welcome newcomers; some Wikipedians award those who they feel deserve awards. Some upload images or help others do so; some work on history articles; some clean up grammar; and still others work on reverting vandalism. Many take on all of these tasks. Whatever one decides to do, every Wikipedian is a valuable member of the community.

Wikipedians who contribute mainly by writing and editing the contents of Wikipedia, without interacting much on Talk or administrative pages, are sometimes called exopedians, whereas those who spend significant time on such community interactions are contrasted as metapedians. A multitude of views and other contribution characteristics are represented well by common Wikipedia-related userboxes: Wikipedia:Userboxes/Wikipedia.

[edit] See also

Meta-Wiki

Categorisation

Other

[edit] References

^ This number is dynamicaly updated with the magic word NUMBEROFUSERS

^ These numbers are dynamicaly updated with the magic word

NUMBERINGROUP:groupname

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^ Edit activity levels of registered users and bots per group of namespaces

^ This number is dynamicaly updated with the magic word NUMBEROFACTIVEUSERS

^ a b Collaborative Creativity Group, <http://www.wikipediastudy.org/>, retrieved 2011-03-22

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[edit] External links

Blue whale[1]

Adult blue whale from the eastern Pacific Ocean

Size compared to an average human

Conservation status

Scientific classification

Kingdom:

Animalia

Phylum:

Chordata

Class:

Mammalia

Order:

Cetacea

Suborder:

Mysticeti

Family:

Balaenopteridae

Genus:

Balaenoptera

Species:

B. musculus

Binomial name

Balaenoptera musculus(Linnaeus, 1758)

Subspecies

B. m. breviceuda Ichihara, 1966
?B. m. indica Blyth, 1859
B. m. intermedia Burmeister, 1871
B. m. musculus Linnaeus, 1758
Blue whale range (in blue)

Synonyms

Balaenoptera gibbar Scoresby, 1820
Pterobalaena gigas Van Beneden, 1861
Physalus latirostris Flower, 1864
Sibbaldius borealis Gray, 1866
Flowerius gigas Lilljeborg, 1867
Sibbaldius sulfureus Cope, 1869
Balaenoptera sibbaldii Sars, 1875

The blue whale (*Balaenoptera musculus*) is a marine mammal belonging to the suborder of baleen whales (called *Mysticeti*).^[3] At 30 metres (98 ft)^[4] in length and 170 tonnes (190 short tons)^[5] or more in weight, it is the largest known animal to have ever existed.^[6]

Long and slender, the blue whale's body can be various shades of bluish-grey dorsally and somewhat lighter underneath.^[7] There are at least three distinct subspecies: *B. m. musculus* of the North Atlantic and North Pacific, *B. m. intermedia* of the Southern Ocean and *B. m. breviceuda* (also known as the pygmy blue whale) found in the Indian Ocean and South Pacific Ocean. *B. m. indica*, found in the Indian Ocean, may be another subspecies. As with other baleen whales, its diet consists almost exclusively of small crustaceans known as krill.^[8]

Blue whales were abundant in nearly all the oceans on Earth until the beginning of the twentieth century. For over a century, they were hunted almost to extinction by whalers until protected by the international community in 1966. A 2002 report estimated there were 5,000 to 12,000 blue whales worldwide,^[9] located in at least five groups. More recent research into the Pygmy subspecies suggests this may be an underestimate.^[10] Before whaling, the largest population was in the Antarctic, numbering approximately 239,000 (range 202,000 to 311,000).^[11] There remain only much smaller (around 2,000) concentrations in each of the eastern North Pacific, Antarctic, and Indian Ocean groups. There are two more groups in the North Atlantic, and at least two in the Southern Hemisphere.

Taxonomy

Blue whales are rorquals (family *Balaenopteridae*), a family that includes the humpback whale, the fin whale, Bryde's whale, the sei whale, and the minke whale.^[3] The family *Balaenopteridae* is believed to have diverged from the other families of the suborder *Mysticeti* as long ago as the middle Oligocene. It is not known when the members of those families diverged from each other.

The blue whale is usually classified as one of eight species in the genus *Balaenoptera*; one authority places it in a separate monotypic genus, *Sibbaldus*,^[12] but this is not accepted elsewhere.^[1] DNA sequencing analysis indicates that the blue whale is phylogenetically closer to the sei whale (*Balaenoptera borealis*) and Bryde's whale (*Balaenoptera brydei*) than to other *Balaenoptera* species, and closer to the humpback whale (*Megaptera*) and the gray whale (*Eschrichtius*) than to the minke whales (*Balaenoptera acutorostrata* and *Balaenoptera bonaerensis*).^{[13][14]} If further research confirms these relationships, it will be necessary to reclassify the rorquals.

There have been at least 11 documented cases of blue/fin hybrid adults in the wild. Arnason and Gullberg describe the genetic distance between a blue and a fin as about the same as that between a human and a gorilla.^[15] Researchers working off Fiji believe they photographed a hybrid humpback/blue whale.^[16]

The first published description of the blue whale comes from Robert Sibbald's *Phalainologia Nova* (1694). In September 1692, Sibbald found a blue whale that had stranded in the Firth of Forth—a male 78-feet-long—which had "black, horny

plates" and "two large apertures approaching a pyramid in shape".[17]

The specific name *musculus* is Latin and could mean "muscle", but it can also be interpreted as "little mouse".[18] Carl Linnaeus, who named the species in his seminal *Systema Naturae* of 1758,[19] would have known this and may have intended the ironic double meaning.[20] Herman Melville called this species sulphur-bottom in his novel *Moby-Dick* due to an orange-brown or yellow tinge on the underparts from diatom films on the skin. Other common names for the blue whale have included Sibbald's rorqual (after Sibbald, who first described the species), the great blue whale and the great northern rorqual. These names have now fallen into disuse. The first known usage of the term blue whale was in Melville's *Moby-Dick*, which only mentions it in passing and does not specifically attribute it to the species in question. The name was really derived from the Norwegian *blåhval*, coined by Svend Foyn shortly after he had perfected the harpoon gun; the Norwegian scientist G. O. Sars adopted it as the Norwegian common name in 1874.[17]

Authorities classify the species into three or four subspecies: *B. m. musculus*, the northern blue whale consisting of the North Atlantic and North Pacific populations, *B. m. intermedia*, the southern blue whale of the Southern Ocean, *B. m. breviceuda*, the pygmy blue whale found in the Indian Ocean and South Pacific,[21] and the more problematic *B. m. indica*, the great Indian rorqual, which is also found in the Indian Ocean and, although described earlier, may be the same subspecies as *B. m. breviceuda*. [1]

Description and behaviour

The blue whale has a long tapering body that appears stretched in comparison with the stockier build of other whales.[22] The head is flat, U-shaped and has a prominent ridge running from the blowhole to the top of the upper lip.[22] The front part of the mouth is thick with baleen plates; around 300 plates (each around one metre (3.28 ft) long)[22] hang from the upper jaw, running 0.5 m (1.6 ft) back into the mouth. Between 70 and 118 grooves (called ventral pleats) run along the throat parallel to the body length. These pleats assist with evacuating water from the mouth after lunge feeding (see feeding below).

The dorsal fin is small,[22] ranging in height from 8 to 70 centimeters (3.1 to 28 in) (usually 20 to 40 centimeters (7.9 to 16 in)) and averaging about 28 centimetres (11 in).[23] It is visible only briefly during the dive sequence. Located around three-quarters of the way along the length of the body, it varies in shape from one individual to another; some only have a barely perceptible lump, but others may have prominent and falcate (sickle-shaped) dorsals. When surfacing to breathe, the blue whale raises its shoulder and blowhole out of the water to a greater extent than other large whales, such as the fin or sei whales. Observers can use this trait to differentiate between species at sea. Some blue whales in the North Atlantic and North Pacific raise their tail fluke when diving. When breathing, the whale emits a spectacular vertical single-column spout up to 12 metres (39 ft), typically 9 metres (30 ft). Its lung capacity is 5,000 litres (1320 U.S. gallons). Blue whales have twin blowholes shielded by a large splashguard.[22]

The flippers are 3 to 4 metres (9.8 to 13 ft) long. The upper sides are grey with a thin white border; the lower sides are white. The head and tail fluke are generally uniformly grey. The whale's upper parts, and sometimes the flippers, are usually mottled. The degree of mottling varies substantially from individual to individual. Some may have a uniform slate-grey color, but others demonstrate a considerable variation of dark blues, greys and blacks, all tightly mottled.[3]

Blue whales can reach speeds of 50 kilometres per hour (31 mph) over short bursts, usually when interacting with other whales, but 20 kilometres per hour (12 mph) is a more typical traveling speed.[3] When feeding, they slow down to 5 kilometres per hour (3.1 mph).

Blue whales most commonly live alone or with one other individual. It is not known how long traveling pairs stay together. In locations where there is a high concentration of food, as many as 50 blue whales have been seen scattered over a small area. They do not form the large, close-knit groups seen in other

baleen species.

Physical description

Size

The blue whale is the largest animal ever known to have lived.[22] The largest known dinosaur of the Mesozoic Era was *Argentinosaurus*,[24] which is estimated to have weighed up to 90 metric tons (99Â short tons).

Blue whales are difficult to weigh because of their size. As is the case with most large whales targeted by whalers, adult blue whales have never been weighed whole, but cut up into manageable pieces first. This caused an underestimate of the total weight of the whale, due to the loss of blood and other fluids. Nevertheless, measurements between 150Â ^170 metric tons (170Â ^190 short tons) were recorded of animals up to 27 metres (89Â ft) in length. The weight of an individual 30 metres (98Â ft) long is believed by the American National Marine Mammal Laboratory (NMML) to be in excess of 180 metric tons (200Â short tons). The largest blue whale accurately weighed by NMML scientists to date was a female that weighed 177 metric tons (195Â short tons).[9] As a whole, blue whales from the Northern Atlantic and Pacific appear to be smaller on average than those from sub-Antarctic waters.

There is some uncertainty about the biggest blue whale ever found, as most data came from blue whales killed in Antarctic waters during the first half of the twentieth century, and was collected by whalers not well-versed in standard zoological measurement techniques. The heaviest whale ever recorded weighed in at 190 metric tons (210Â short tons).[25] The longest whales ever recorded were two females measuring 33.6 metres (110Â ft) and 33.3 metres (109Â ft), although in neither of these cases was the piecemeal weight gathered.[26] The longest whale measured by scientists at the NMML was a 29.9 metres (98Â ft),[9] female caught in the Antarctic by Japanese whalers in 1946Â ^47. Lieut. Quentin R. Walsh, USCG, while acting as whaling inspector of the factory ship *Ulysses*, verified the measurement of a 30 m (98 ft) pregnant blue whale caught in the Antarctic in the 1937Â ^38 season.[27] The longest reported in the North Pacific was a 27.1 metres (89Â ft) female taken by Japanese whalers in 1959, and the longest reported in the North Atlantic was a 28.1 metres (92Â ft) female caught in the Davis Strait.[17]

Due to its large size, several organs of the blue whale are the largest in the animal kingdom. A blue whale's tongue weighs around 2.7 metric tons (3.0Â short tons)[28] and, when fully expanded, its mouth is large enough to hold up to 90 metric tons (99Â short tons) of food and water.[8] Despite the size of its mouth, the dimensions of its throat are such that a blue whale cannot swallow an object wider than a beach ball.[29] Its heart weighs 600 kilograms (1,300Â lb) and is the largest known in any animal.[28] A blue whale's aorta is about 23 centimetres (9.1Â in) in diameter.[30] During the first seven months of its life, a blue whale calf drinks approximately 400 litres (110Â USgal) of milk every day. Blue whale calves gain weight quickly, as much as 90 kilograms (200Â lb) every 24 hours. Even at birth, they weigh up to 2,700 kilograms (6,000Â lb)Â ~the same as a fully grown hippopotamus.[3] Blue whales have relatively small brains, only about 6.92 kilograms (15.26Â lb) , about 0.007% of its body weight.[31]

Feeding

Blue whales feed almost exclusively on krill, though they also take small numbers of copepods.[32] The species of this zooplankton eaten by blue whales varies from ocean to ocean. In the North Atlantic, *Meganyctiphanes norvegica*, *Thysanoessa raschii*, *Thysanoessa inermis* and *Thysanoessa longicaudata* are the usual food;[33][34][35] in the North Pacific, *Euphausia pacifica*, *Thysanoessa inermis*, *Thysanoessa longipes*, *Thysanoessa spinifera*, *Nyctiphanes simplex* and *Nematoscelis megalops*:[36][37][38] and in the Antarctic, *Euphausia superba*, *Euphausia crystallorophias* and *Euphausia valentini*.

An adult blue whale can eat up to 40 million krill in a day.[39] The whales always feed in the areas with the highest concentration of krill, sometimes eating up to 3,600 kilograms (7,900Â lb) of krill in a single day.[32] The daily energy requirement of an adult blue whale is in the region of 1.5 million

kilocalories.[40] Their feeding habits are seasonal. Blue whales gorge on krill in the rich waters of the Antarctic before migrating to their breeding grounds in the warmer, less-rich waters nearer the equator. The blue whale can take in up to 90 times as much energy as it expends, allowing it to build up considerable energy reserves.[41][42][43]

Because krill move, blue whales typically feed at depths of more than 100 metres (330 ft) during the day and only surface-feed at night. Dive times are typically 10 minutes when feeding, though dives of up to 20 minutes are common. The longest recorded dive is 36 minutes.[44] The whale feeds by lunging forward at groups of krill, taking the animals and a large quantity of water into its mouth. The water is then squeezed out through the baleen plates by pressure from the ventral pouch and tongue. Once the mouth is clear of water, the remaining krill, unable to pass through the plates, are swallowed. The blue whale also incidentally consumes small fish, crustaceans and squid caught up with krill.[45][46]

Life history

Mating starts in late autumn and continues to the end of winter.[47] Little is known about mating behaviour or breeding grounds. Females typically give birth once every two to three years at the start of the winter after a gestation period of 10 to 12 months.[47] The calf weighs about 2.5 metric tons (2.8 short tons) and is around 7 metres (23 ft) in length. Blue whale calves drink 380–570 litres (100–150 U.S. gallons) of milk a day. The calf is weaned after six months, by which time it has doubled in length. Sexual maturity is typically reached at five to ten years of age. In the Northern Hemisphere, whaling records show that males averaged 20–21 m (65.6–69 ft) and females 21–23 m (69–75 ft) at sexual maturity,[48] while in the Southern Hemisphere it was 22.6 m (74 ft) and 24 m (79 ft), respectively.[49] In the Southern Hemisphere, as adults, males averaged 25 m (82 ft) and females 26.5 m (87 ft).[49] In the North Pacific, photogrammetric studies have shown blue whale adults today average 21.6 m (71 ft), with a maximum of over 24.4 m (80 ft)[50] although a 26.5 m (87 ft) female stranded near Pescadero, California in 1979.[51]

Scientists estimate that blue whales can live for at least 80 years,[26][47][52] but since individual records do not date back into the whaling era, this will not be known with certainty for many years. The longest recorded study of a single individual is 34 years, in the eastern North Pacific.[44] The whales' only natural predator is the orca.[53] Studies report that as many as 25% of mature blue whales have scars resulting from orca attacks.[26] The mortality rate of such attacks is unknown.

Blue whale strandings are extremely uncommon, and, because of the species' social structure, mass strandings are unheard of.[54] When strandings do occur, they can become the focus of public interest. In 1920, a blue whale washed up near Bragar on the Isle of Lewis in the Outer Hebrides of Scotland. It had been shot by whalers, but the harpoon had failed to explode. As with other mammals, the fundamental instinct of the whale was to try to carry on breathing at all costs, even though this meant beaching to prevent itself from drowning. Two of the whale's bones were erected just off a main road on Lewis and remain a tourist attraction.[55]

Vocalizations

Estimates made by Cummings and Thompson (1971) suggest the source level of sounds made by blue whales are between 155 and 188 decibels when measured relative to a reference pressure of one micropascal at one metre.[56][57] All blue whale groups make calls at a fundamental frequency between 10 and 40 Hz; the lowest frequency sound a human can typically perceive is 20 Hz. Blue whale calls last between ten and thirty seconds. Blue whales off the coast of Sri Lanka have been repeatedly recorded making "songs" of four notes, lasting about two minutes each, reminiscent of the well-known humpback whale songs. As this phenomenon has not been seen in any other populations, researchers believe it may be unique to the *B. m. breviceauda* (pygmy) subspecies.

The reason for vocalization is unknown. Richardson et al. (1995) discuss six possible reasons:[58]

Maintenance of inter-individual distance

Species and individual recognition

Contextual information transmission (for example feeding, alarm, courtship)

Maintenance of social organization (for example contact calls between females and males)

Location of topographic features

Location of prey resources

Population and whaling

Hunting era

Blue whales are not easy to catch or kill. Their speed and power meant that they were rarely pursued by early whalers, who instead targeted sperm and right whales.[59] In 1864, the Norwegian Svend Foyn equipped a steamboat with harpoons specifically designed for catching large whales.[3] Although it was initially cumbersome and had a low success rate, Foyn perfected the harpoon gun, and soon several whaling stations were established on the coast of Finnmark in northern Norway. Because of disputes with the local fishermen, the last whaling station in Finnmark was closed down in 1904.

Soon, blue whales were being hunted off Iceland (1883), the Faroe Islands (1894), Newfoundland (1898), and Spitsbergen (1903). In 1904⁰⁵ the first blue whales were taken off South Georgia. By 1925, with the advent of the stern slipway in factory ships and the use of steam-driven whale catchers, the catch of blue whales, and baleen whales as a whole, in the Antarctic and sub-Antarctic began to increase dramatically. In the 1930³¹ season, these ships caught 29,400 blue whales in the Antarctic alone. By the end of World War II, populations had been significantly depleted, and, in 1946, the first quotas restricting international trade in whales were introduced, but they were ineffective because of the lack of differentiation between species. Rare species could be hunted on an equal footing with those found in relative abundance.

Arthur C. Clarke, in his 1962 book *Profiles of the Future*, was the first prominent intellectual to call attention to the plight of the blue whale. He mentioned its large brain and said, "we do not know the true nature of the entity we are destroying." [60]

Blue whale hunting was banned in 1966 by the International Whaling Commission,[61][62] and illegal whaling by the USSR finally halted in the 1970s,[63] by which time 330,000 blue whales had been caught in the Antarctic, 33,000 in the rest of the Southern Hemisphere, 8,200 in the North Pacific, and 7,000 in the North Atlantic. The largest original population, in the Antarctic, had been reduced to 0.15% of their initial numbers.[11]

Population and distribution today

Since the introduction of the whaling ban, studies have failed to ascertain whether the conservation reliant global blue whale population is increasing or remaining stable. In the Antarctic, best estimates show a significant increase at 7.3% per year since the end of illegal Soviet whaling, but numbers remain at under 1% of their original levels.[11] It has also been suggested that Icelandic and Californian populations are increasing but these increases are not statistically significant. The total world population was estimated to be between 5,000 and 12,000 in 2002, although there are high levels of uncertainty in available estimates for many areas.[9]

The IUCN Red List counts the blue whale as "endangered" as it has since the list's inception. In the United States, the National Marine Fisheries Service lists them as endangered under the Endangered Species Act.[64] The largest known concentration, consisting of about 2,800 individuals, is the northeast Pacific population of the northern blue whale (*B. m. musculus*) subspecies that ranges from Alaska to Costa Rica, but is most commonly seen from California in summer.[65] Infrequently, this population visits the northwest Pacific between Kamchatka and the northern tip of Japan.

In the North Atlantic, two stocks of *B. m. musculus* are recognised. The first is found off Greenland, Newfoundland, Nova Scotia and the Gulf of Saint Lawrence. This group is estimated to total about 500. The second, more easterly

group is spotted from the Azores in spring to Iceland in July and August; it is presumed the whales follow the Mid-Atlantic Ridge between the two volcanic islands. Beyond Iceland, blue whales have been spotted as far north as Spitsbergen and Jan Mayen, though such sightings are rare. Scientists do not know where these whales spend their winters. The total North Atlantic population is estimated to be between 600 and 1,500.

In the Southern Hemisphere, there appear to be two distinct subspecies, *B. m. intermedia*, the Antarctic blue whale, and the little-studied pygmy blue whale, *B. m. breviceauda*, found in Indian Ocean waters. The most recent surveys (midpoint 1998) provided an estimate of 2,280 blue whales in the Antarctic[66] (of which fewer than 1% are likely to be pygmy blue whales).[67] Estimates from a 1996 survey show that 424 pygmy blue whales were in a small area south of Madagascar alone,[68] thus it is likely that numbers in the entire Indian Ocean are in the thousands. If this is true, the global numbers would be much higher than estimates predict.[10]

A fourth subspecies, *B. m. indica*, was identified by Blyth in 1859 in the northern Indian Ocean, but difficulties in identifying distinguishing features for this subspecies led to it being used a synonym for *B. m. breviceauda*, the pygmy blue whale. Records for Soviet catches seem to indicate that the female adult size is closer to that of the Pygmy Blue than *B. m. musculus*, although the populations of *B. m. indica* and *B. m. breviceauda* appear to be discrete, and the breeding seasons differ by almost six months.[69]

Migratory patterns of these subspecies are not well known. For example, pygmy blue whales have been recorded in the northern Indian Ocean (Oman, Maldives and Sri Lanka), where they may form a distinct resident population.[69] In addition, the population of blue whales occurring off Chile and Peru may also be a distinct population. Some Antarctic blue whales approach the eastern South Atlantic coast in winter, and occasionally, their vocalizations are heard off Peru, Western Australia, and in the northern Indian Ocean.[69] In Chile, the Cetacean Conservation Center, with support from the Chilean Navy, is undertaking extensive research and conservation work on a recently discovered feeding aggregation of the species off the coast of Chiloe Island in the Gulf of Corcovado, where 326 blue whales were spotted in 2007.[70]

Efforts to calculate the blue whale population more accurately are supported by marine mammalogists at Duke University, who maintain the Ocean Biogeographic Information SystemâSpatial Ecological Analysis of Megavertebate Populations (OBIS-SEAMAP), a collation of marine mammal sighting data from around 130 sources.[71]

Threats other than hunting

Due to their enormous size, power and speed, adult blue whales have virtually no natural predators. There is one documented case in National Geographic Magazine of a blue whale being attacked by orcas off the Baja California Peninsula; although the orcas were unable to kill the animal outright during their attack, the blue whale sustained serious wounds and probably died as a result of them shortly after the attack.[73] Up to a quarter of the blue whales identified in Baja bear scars from orca attacks.[17]

Blue whales may be wounded, sometimes fatally, after colliding with ocean vessels, as well as becoming trapped or entangled in fishing gear.[74] The ever-increasing amount of ocean noise, including sonar, drowns out the vocalizations produced by whales, which makes it harder for them to communicate.[72][74] Blue whales stop producing foraging D calls once a mid-frequency sonar is activated, even though the sonar frequency range (1â8â100â1000 Hz) far exceeds their sound production range (25â100 Hz).[72] Human threats to the potential recovery of blue whale populations also include accumulation of polychlorinated biphenyl (PCB) chemicals within the whale's body.[8]

With global warming causing glaciers and permafrost to melt rapidly and allowing a large amount of fresh water to flow into the oceans, there are concerns that if the amount of fresh water in the oceans reaches a critical point, there will be a disruption in the thermohaline circulation.[75] Considering the blue whale's migratory patterns are based on ocean temperature,

a disruption in this circulation, which moves warm and cold water around the world, would be likely to have an effect on their migration.[76] The whales summer in the cool, high latitudes, where they feed in krill-abundant waters; they winter in warmer, low latitudes, where they mate and give birth.[77]

The change in ocean temperature would also affect the blue whale's food supply. The warming trend and decreased salinity levels would cause a significant shift in krill location and abundance.[78]

Museums

The Natural History Museum in London contains a famous mounted skeleton and life-size model of a blue whale, which were both the first of their kind in the world, but have since been replicated at the University of California, Santa Cruz. Similarly, the American Museum of Natural History in New York City has a full-size model in its Milstein Family Hall of Ocean Life. A juvenile blue whale skeleton is installed at the New Bedford Whaling Museum in New Bedford, Massachusetts.

The Aquarium of the Pacific in Long Beach, California features a life-size model of a mother blue whale with her calf suspended from the ceiling of its main hall.[79] The Beaty Biodiversity Museum at the University of British Columbia, Canada, houses a display of a blue whale skeleton (skull is cast replica) directly on the main campus boulevard.[80] A real skeleton of a blue whale at the Canadian Museum of Nature in Ottawa was also unveiled in May 2010.[81]

The Museum of Natural History in Gothenburg, Sweden contains the only stuffed blue whale in the world. There one can also find the skeleton of the whale mounted beside the whale.

The Melbourne Museum features a skeleton of the pygmy blue whale.

Whale-watching

Blue whales may be encountered (but rarely) on whale-watching cruises in the Gulf of Maine[82] and are the main attractions along the north shore of the Gulf of Saint Lawrence and in the Saint Lawrence estuary.[74] Blue whales can also be seen off Southern California, starting as early as March and April, with the peak between July and September.[83]

In Chile, the Alfaguara project combines conservation measures for the population of blue whales feeding off Chiloë Island with whale watching and other ecotourism activities that bring economic benefits to the local people.[84] Whale-watching, principally blue whales, is also carried out south of Sri Lanka.[85]

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A virus is a small infectious agent that can replicate only inside the living cells of an organism. Viruses can infect all types of organisms, from animals and plants to bacteria and archaea.[1]

Since Dmitri Ivanovsky's 1892 article describing a non-bacterial pathogen infecting tobacco plants, and the discovery of the tobacco mosaic virus by Martinus Beijerinck in 1898,[2] about 5,000 viruses have been described in detail,[3] although there are millions of different types.[4] Viruses are found in almost every ecosystem on Earth and are the most abundant type of biological entity.[5][6] The study of viruses is known as virology, a sub-speciality of microbiology.

Virus particles (known as virions) consist of two or three parts: i) the genetic material made from either DNA or RNA, long molecules that carry genetic information; ii) a protein coat that protects these genes; and in some cases iii) an envelope of lipids that surrounds the protein coat when they are outside a cell. The shapes of viruses range from simple helical and icosahedral forms to more complex structures. The average virus is about one one-hundredth the size of the average bacterium. Most viruses are too small to be seen

directly with an optical microscope.

The origins of viruses in the evolutionary history of life are unclear: some may have evolved from plasmids—pieces of DNA that can move between cells—while others may have evolved from bacteria. In evolution, viruses are an important means of horizontal gene transfer, which increases genetic diversity.[7] Viruses are considered by some to be a life form, because they carry genetic material, reproduce, and evolve through natural selection. However they lack key characteristics (such as cell structure) that are generally considered necessary to count as life. Because they possess some but not all such qualities, viruses have been described as "organisms at the edge of life".[8]

Viruses spread in many ways; viruses in plants are often transmitted from plant to plant by insects that feed on plant sap, such as aphids; viruses in animals can be carried by blood-sucking insects. These disease-bearing organisms are known as vectors. Influenza viruses are spread by coughing and sneezing. Norovirus and rotavirus, common causes of viral gastroenteritis, are transmitted by the faecal–oral route and are passed from person to person by contact, entering the body in food or water. HIV is one of several viruses transmitted through sexual contact and by exposure to infected blood. The range of host cells that a virus can infect is called its "host range". This can be narrow or, as when a virus is capable of infecting many species, broad.[9]

Viral infections in animals provoke an immune response that usually eliminates the infecting virus. Immune responses can also be produced by vaccines, which confer an artificially acquired immunity to the specific viral infection. However, some viruses including those that cause AIDS and viral hepatitis evade these immune responses and result in chronic infections. Antibiotics have no effect on viruses, but several antiviral drugs have been developed.

Etymology

The word is from the Latin virus referring to poison and other noxious substances, first used in English in 1392.[10] Virulent, from Latin virulentus (poisonous), dates to 1400.[11] A meaning of "agent that causes infectious disease" is first recorded in 1728,[10] before the discovery of viruses by Dmitri Ivanovsky in 1892. The plural is viruses. The adjective viral dates to 1948.[12] The term virion (plural virions), which dates from 1959,[13] is also used to refer to a single, stable infective viral particle that is released from the cell and is fully capable of infecting other cells of the same type.[14]

History

Louis Pasteur was unable to find a causative agent for rabies and speculated about a pathogen too small to be detected using a microscope.[15] In 1884, the French microbiologist Charles Chamberland invented a filter (known today as the Chamberland filter or Chamberland-Pasteur filter) with pores smaller than bacteria. Thus, he could pass a solution containing bacteria through the filter and completely remove them from the solution.[16] In 1892, the Russian biologist Dmitri Ivanovsky used this filter to study what is now known as the tobacco mosaic virus. His experiments showed that crushed leaf extracts from infected tobacco plants remain infectious after filtration. Ivanovsky suggested the infection might be caused by a toxin produced by bacteria, but did not pursue the idea.[17] At the time it was thought that all infectious agents could be retained by filters and grown on a nutrient medium—this was part of the germ theory of disease.[2] In 1898, the Dutch microbiologist Martinus Beijerinck repeated the experiments and became convinced that the filtered solution contained a new form of infectious agent.[18] He observed that the agent multiplied only in cells that were dividing, but as his experiments did not show that it was made of particles, he called it a contagium vivum fluidum (soluble living germ) and re-introduced the word virus.[17] Beijerinck maintained that viruses were liquid in nature, a theory later discredited by Wendell Stanley, who proved they were particulate.[17] In the same year Friedrich Loeffler and Frosch passed the first animal virus—agent of foot-and-mouth disease (aphthovirus)—through a similar filter.[14]

In the early 20th century, the English bacteriologist Frederick Twort discovered a group of viruses that infect bacteria, now called bacteriophages[19] (or commonly phages), and the French-Canadian microbiologist Félix d'Herelle described viruses that, when added to bacteria on agar, would produce areas of dead bacteria. He accurately diluted a suspension of these viruses and discovered that the highest dilutions (lowest virus concentrations), rather than killing all the bacteria, formed discrete areas of dead organisms. Counting these areas and multiplying by the dilution factor allowed him to calculate the number of viruses in the original suspension.[20] Phages were heralded as a potential treatment for diseases such as typhoid and cholera, but their promise was forgotten with the development of penicillin. The study of phages provided insights into the switching on and off of genes, and a useful mechanism for introducing foreign genes into bacteria.

By the end of the 19th century, viruses were defined in terms of their infectivity, their ability to be filtered, and their requirement for living hosts. Viruses had been grown only in plants and animals. In 1906, Ross Granville Harrison invented a method for growing tissue in lymph, and, in 1913, E. Steinhardt, C. Israeli, and R. A. Lambert used this method to grow vaccinia virus in fragments of guinea pig corneal tissue.[21] In 1928, H. B. Maitland and M. C. Maitland grew vaccinia virus in suspensions of minced hens' kidneys. Their method was not widely adopted until the 1950s, when poliovirus was grown on a large scale for vaccine production.[22]

Another breakthrough came in 1931, when the American pathologist Ernest William Goodpasture grew influenza and several other viruses in fertilized chickens' eggs.[23] In 1949, John Franklin Enders, Thomas Weller, and Frederick Robbins grew polio virus in cultured human embryo cells, the first virus to be grown without using solid animal tissue or eggs. This work enabled Jonas Salk to make an effective polio vaccine.[24]

The first images of viruses were obtained upon the invention of electron microscopy in 1931 by the German engineers Ernst Ruska and Max Knoll.[25] In 1935, American biochemist and virologist Wendell Meredith Stanley examined the tobacco mosaic virus and found it was mostly made of protein.[26] A short time later, this virus was separated into protein and RNA parts.[27] The tobacco mosaic virus was the first to be crystallised and its structure could therefore be elucidated in detail. The first X-ray diffraction pictures of the crystallised virus were obtained by Bernal and Fankuchen in 1941. On the basis of her pictures, Rosalind Franklin discovered the full DNA structure of the virus in 1955.[28] In the same year, Heinz Fraenkel-Conrat and Robley Williams showed that purified tobacco mosaic virus RNA and its coat protein can assemble by themselves to form functional viruses, suggesting that this simple mechanism was probably the means through which viruses were created within their host cells.[29]

The second half of the 20th century was the golden age of virus discovery and most of the over 2,000 recognised species of animal, plant, and bacterial viruses were discovered during these years.[30] In 1957, equine arterivirus and the cause of Bovine virus diarrhoea (a pestivirus) were discovered. In 1963, the hepatitis B virus was discovered by Baruch Blumberg,[31] and in 1965, Howard Temin described the first retrovirus. Reverse transcriptase, the key enzyme that retroviruses use to translate their RNA into DNA, was first described in 1970, independently by Howard Martin Temin and David Baltimore.[32] In 1983 Luc Montagnier's team at the Pasteur Institute in France, first isolated the retrovirus now called HIV.[33]

Origins

Viruses are found wherever there is life and have probably existed since living cells first evolved.[34] The origin of viruses is unclear because they do not form fossils, so molecular techniques have been used to compare the DNA or RNA of viruses and are a useful means of investigating how they arose.[35] There are three main hypotheses that try to explain the origins of viruses:[36][37]

Regressive hypothesis

Viruses may have once been small cells that parasitised larger cells. Over time, genes not required by their parasitism were lost. The bacteria rickettsia and chlamydia are living cells that, like viruses, can reproduce only inside host cells. They lend support to this hypothesis, as their dependence on parasitism is likely to have caused the loss of genes that enabled them to survive outside a cell. This is also called the degeneracy hypothesis,[38][39] or reduction hypothesis.[40]

Cellular origin hypothesis

Some viruses may have evolved from bits of DNA or RNA that "escaped" from the genes of a larger organism. The escaped DNA could have come from plasmids (pieces of naked DNA that can move between cells) or transposons (molecules of DNA that replicate and move around to different positions within the genes of the cell).[41] Once called "jumping genes", transposons are examples of mobile genetic elements and could be the origin of some viruses. They were discovered in maize by Barbara McClintock in 1950.[42] This is sometimes called the vagrancy hypothesis,[38][43] or the escape hypothesis.[40]

Coevolution hypothesis

This is also called the virus-first hypothesis[40] and proposes that viruses may have evolved from complex molecules of protein and nucleic acid at the same time as cells first appeared on Earth and would have been dependent on cellular life for billions of years. Viroids are molecules of RNA that are not classified as viruses because they lack a protein coat. However, they have characteristics that are common to several viruses and are often called subviral agents.[44] Viroids are important pathogens of plants.[45] They do not code for proteins but interact with the host cell and use the host machinery for their replication.[46] The hepatitis delta virus of humans has an RNA genome similar to viroids but has a protein coat derived from hepatitis B virus and cannot produce one of its own. It is, therefore, a defective virus and cannot replicate without the help of hepatitis B virus.[47] In similar manner, the sputnik virophage is dependent on mimivirus, which infects the protozoan *Acanthamoeba castellanii*. [48] These viruses that are dependent on the presence of other virus species in the host cell are called satellites and may represent evolutionary intermediates of viroids and viruses.[49][50]

In the past, there were problems with all of these hypotheses: the regressive hypothesis did not explain why even the smallest of cellular parasites do not resemble viruses in any way. The escape hypothesis did not explain the complex capsids and other structures on virus particles. The virus-first hypothesis contravened the definition of viruses in that they require host cells.[40] Viruses are now recognised as ancient and to have origins that pre-date the divergence of life into the three domains.[51] This discovery has led modern virologists to reconsider and re-evaluate these three classical hypotheses.[51]

The evidence for an ancestral world of RNA cells[52] and computer analysis of viral and host DNA sequences are giving a better understanding of the evolutionary relationships between different viruses and may help identify the ancestors of modern viruses. To date, such analyses have not proved which of these hypotheses is correct.[52] However, it seems unlikely that all currently known viruses have a common ancestor, and viruses have probably arisen numerous times in the past by one or more mechanisms.[53]

Prions are infectious protein molecules that do not contain DNA or RNA.[54] They can cause infections such as scrapie in sheep, bovine spongiform encephalopathy ("mad cow" disease) in cattle, and chronic wasting disease in deer; in humans prionic diseases include Kuru, Creutzfeldt-Jakob disease, and Gerstmann-Strussler-Scheinker syndrome.[55] They are able to replicate because some proteins can exist in two different shapes and the prion changes the normal shape of a host protein into the prion shape. This starts a chain reaction where each prion protein converts many host proteins into more prions, and these new prions then go on to convert even more protein into prions; all known prion diseases are fatal. Although prions are fundamentally different from viruses and viroids, their discovery gives credence to the theory that viruses could have evolved from self-replicating molecules.[56]

Microbiology

Life properties

Opinions differ on whether viruses are a form of life, or organic structures that interact with living organisms. They have been described as "organisms at the edge of life", [8] since they resemble organisms in that they possess genes and evolve by natural selection, [57] and reproduce by creating multiple copies of themselves through self-assembly. Although they have genes, they do not have a cellular structure, which is often seen as the basic unit of life. Viruses do not have their own metabolism, and require a host cell to make new products. They therefore cannot naturally reproduce outside a host cell [58] although bacterial species such as rickettsia and chlamydia are considered living organisms despite the same limitation. [59] [60] Accepted forms of life use cell division to reproduce, whereas viruses spontaneously assemble within cells. They differ from autonomous growth of crystals as they inherit genetic mutations while being subject to natural selection. Virus self-assembly within host cells has implications for the study of the origin of life, as it lends further credence to the hypothesis that life could have started as self-assembling organic molecules. [1]

Structure

Viruses display a wide diversity of shapes and sizes, called morphologies. In general, viruses are much smaller than bacteria. Most viruses that have been studied have a diameter between 20 and 300 nanometres. Some filoviruses have a total length of up to 1400 nm; their diameters are only about 80 nm. [61] Most viruses cannot be seen with an optical microscope so scanning and transmission electron microscopes are used to visualise virions. [62] To increase the contrast between viruses and the background, electron-dense "stains" are used. These are solutions of salts of heavy metals, such as tungsten, that scatter the electrons from regions covered with the stain. When virions are coated with stain (positive staining), fine detail is obscured. Negative staining overcomes this problem by staining the background only. [63]

A complete virus particle, known as a virion, consists of nucleic acid surrounded by a protective coat of protein called a capsid. These are formed from identical protein subunits called capsomeres. [64] Viruses can have a lipid "envelope" derived from the host cell membrane. The capsid is made from proteins encoded by the viral genome and its shape serves as the basis for morphological distinction. [65] [66] Virally coded protein subunits will self-assemble to form a capsid, in general requiring the presence of the virus genome. Complex viruses code for proteins that assist in the construction of their capsid. Proteins associated with nucleic acid are known as nucleoproteins, and the association of viral capsid proteins with viral nucleic acid is called a nucleocapsid. The capsid and entire virus structure can be mechanically (physically) probed through atomic force microscopy. [67] [68] In general, there are four main morphological virus types:

Helical

These viruses are composed of a single type of capsomer stacked around a central axis to form a helical structure, which may have a central cavity, or hollow tube. This arrangement results in rod-shaped or filamentous virions: These can be short and highly rigid, or long and very flexible. The genetic material, in general, single-stranded RNA, but ssDNA in some cases, is bound into the protein helix by interactions between the negatively charged nucleic acid and positive charges on the protein. Overall, the length of a helical capsid is related to the length of the nucleic acid contained within it and the diameter is dependent on the size and arrangement of capsomers. The well-studied tobacco mosaic virus is an example of a helical virus. [69]

Icosahedral

Most animal viruses are icosahedral or near-spherical with icosahedral symmetry. A regular icosahedron is the optimum way of forming a closed shell from identical sub-units. The minimum number of identical capsomers required is twelve, each composed of five identical sub-units. Many viruses, such as rotavirus, have more than twelve capsomers and appear spherical but they retain

this symmetry. Capsomers at the apices are surrounded by five other capsomers and are called pentons. Capsomers on the triangular faces are surrounded by six others and are called hexons.[70] Hexons are in essence flat and pentons, which form the 12 vertices, are curved. The same protein may act as the subunit of both the pentamers and hexamers or they may be composed of different proteins.

Prolate

This is an isosahedron elongated along the fivefold axis and is a common arrangement of the heads of bacteriophages. This structure is composed of a cylinder with a cap at either end.[71]

Envelope

Some species of virus envelop themselves in a modified form of one of the cell membranes, either the outer membrane surrounding an infected host cell or internal membranes such as nuclear membrane or endoplasmic reticulum, thus gaining an outer lipid bilayer known as a viral envelope. This membrane is studded with proteins coded for by the viral genome and host genome; the lipid membrane itself and any carbohydrates present originate entirely from the host. The influenza virus and HIV use this strategy. Most enveloped viruses are dependent on the envelope for their infectivity.[72]

Complex

These viruses possess a capsid that is neither purely helical nor purely icosahedral, and that may possess extra structures such as protein tails or a complex outer wall. Some bacteriophages, such as Enterobacteria phage T4, have a complex structure consisting of an icosahedral head bound to a helical tail, which may have a hexagonal base plate with protruding protein tail fibres. This tail structure acts like a molecular syringe, attaching to the bacterial host and then injecting the viral genome into the cell.[73]

The poxviruses are large, complex viruses that have an unusual morphology. The viral genome is associated with proteins within a central disk structure known as a nucleoid. The nucleoid is surrounded by a membrane and two lateral bodies of unknown function. The virus has an outer envelope with a thick layer of protein studded over its surface. The whole virion is slightly pleiomorphic, ranging from ovoid to brick shape.[74] Mimivirus is the largest characterised virus, with a capsid diameter of 400Å nm. Protein filaments measuring 100Å nm project from the surface. The capsid appears hexagonal under an electron microscope, therefore the capsid is probably icosahedral.[75] In 2011, researchers discovered a larger virus on ocean floor of the coast of Las Cruces, Chile. Provisionally named Megavirus chilensis, it can be seen with a basic optical microscope. [76]

Some viruses that infect Archaea have complex structures that are unrelated to any other form of virus, with a wide variety of unusual shapes, ranging from spindle-shaped structures, to viruses that resemble hooked rods, teardrops or even bottles. Other archaeal viruses resemble the tailed bacteriophages, and can have multiple tail structures.[77]

Genome

Genomic diversity among viruses

Property

Parameters

Nucleic acid

DNA

RNA

Both DNA and RNA (at different stages in the life cycle)

Shape

Linear

Circular

Segmented

Strandedness

Single-stranded

Double-stranded

Double-stranded with regions of single-strandedness

Sense

Positive sense (+)
Negative sense (-)
Ambisense (+/-)

An enormous variety of genomic structures can be seen among viral species; as a group, they contain more structural genomic diversity than plants, animals, archaea, or bacteria. There are millions of different types of viruses,[4] although only about 5,000 of them have been described in detail.[3] A virus has either DNA or RNA genes and is called a DNA virus or a RNA virus, respectively. The vast majority of viruses have RNA genomes. Plant viruses tend to have single-stranded RNA genomes and bacteriophages tend to have double-stranded DNA genomes.[78]

Viral genomes are circular, as in the polyomaviruses, or linear, as in the adenoviruses. The type of nucleic acid is irrelevant to the shape of the genome. Among RNA viruses and certain DNA viruses, the genome is often divided up into separate parts, in which case it is called segmented. For RNA viruses, each segment often codes for only one protein and they are usually found together in one capsid. However, all segments are not required to be in the same virion for the virus to be infectious, as demonstrated by brome mosaic virus and several other plant viruses.[61]

A viral genome, irrespective of nucleic acid type, is almost always either single-stranded or double-stranded. Single-stranded genomes consist of an unpaired nucleic acid, analogous to one-half of a ladder split down the middle. Double-stranded genomes consist of two complementary paired nucleic acids, analogous to a ladder. The virus particles of some virus families, such as those belonging to the Hepadnaviridae, contain a genome that is partially double-stranded and partially single-stranded.[78]

For most viruses with RNA genomes and some with single-stranded DNA genomes, the single strands are said to be either positive-sense (called the plus-strand) or negative-sense (called the minus-strand), depending on whether or not they are complementary to the viral messenger RNA (mRNA). Positive-sense viral RNA is in the same sense as viral mRNA and thus at least a part of it can be immediately translated by the host cell. Negative-sense viral RNA is complementary to mRNA and thus must be converted to positive-sense RNA by an RNA-dependent RNA polymerase before translation. DNA nomenclature for viruses with single-sense genomic ssDNA is similar to RNA nomenclature, in that the coding strand for the viral mRNA is complementary to it (-), and the non-coding strand is a copy of it (+).[78] However, several types of ssDNA and ssRNA viruses have genomes that are ambisense in that transcription can occur off both strands in a double-stranded replicative intermediate. Examples include geminiviruses, which are ssDNA plant viruses and arenaviruses, which are ssRNA viruses of animals.[79]

Genome size varies greatly between species. The smallest viral genomes are the ssDNA circoviruses, family Circoviridae, which code for only two proteins and have a genome size of only 2 kilobases; the largest are mimiviruses, which have genome sizes of over 1.2 megabases and code for over one thousand proteins.[80] In general, RNA viruses have smaller genome sizes than DNA viruses because of a higher error-rate when replicating, and have a maximum upper size limit.[35] Beyond this limit, errors in the genome when replicating render the virus useless or uncompetitive. To compensate for this, RNA viruses often have segmented genomes, the genome is split into smaller molecules, thus reducing the chance that an error in a single-component genome will incapacitate the entire genome. In contrast, DNA viruses generally have larger genomes because of the high fidelity of their replication enzymes.[81] Single-strand DNA viruses are an exception to this rule, however, as mutation rates for these genomes can approach the extreme of the ssRNA virus case.[82]

Viruses undergo genetic change by several mechanisms. These include a process called genetic drift where individual bases in the DNA or RNA mutate to other bases. Most of these point mutations are "silent" - they do not change the protein that the gene encodes - but others can confer evolutionary advantages such as resistance to antiviral drugs.[83] Antigenic shift occurs when there is

a major change in the genome of the virus. This can be a result of recombination or reassortment. When this happens with influenza viruses, pandemics might result.[84] RNA viruses often exist as quasispecies or swarms of viruses of the same species but with slightly different genome nucleoside sequences. Such quasispecies are a prime target for natural selection.[85]

Segmented genomes confer evolutionary advantages; different strains of a virus with a segmented genome can shuffle and combine genes and produce progeny viruses or (offspring) that have unique characteristics. This is called reassortment or viral sex.[86]

Genetic recombination is the process by which a strand of DNA is broken and then joined to the end of a different DNA molecule. This can occur when viruses infect cells simultaneously and studies of viral evolution have shown that recombination has been rampant in the species studied.[87] Recombination is common to both RNA and DNA viruses.[88][89]

Replication cycle

Viral populations do not grow through cell division, because they are acellular. Instead, they use the machinery and metabolism of a host cell to produce multiple copies of themselves, and they assemble in the cell.

The life cycle of viruses differs greatly between species but there are six basic stages in the life cycle of viruses:[90]

Attachment is a specific binding between viral capsid proteins and specific receptors on the host cellular surface. This specificity determines the host range of a virus. For example, HIV infects a limited range of human leucocytes. This is because its surface protein, gp120, specifically interacts with the CD4 molecule and a chemokine receptor which is most commonly found on the surface of CD4+ T-Cells. This mechanism has evolved to favour those viruses that infect only cells in which they are capable of replication. Attachment to the receptor can induce the viral envelope protein to undergo changes that results in the fusion of viral and cellular membranes, or changes of non-enveloped virus surface proteins that allow the virus to enter.

Penetration follows attachment: Virions enter the host cell through receptor-mediated endocytosis or membrane fusion. This is often called viral entry. The infection of plant and fungal cells is different from that of animal cells. Plants have a rigid cell wall made of cellulose, and fungi one of chitin, so most viruses can get inside these cells only after trauma to the cell wall.[91] However, nearly all plant viruses (such as tobacco mosaic virus) can also move directly from cell to cell, in the form of single-stranded nucleoprotein complexes, through pores called plasmodesmata.[92] Bacteria, like plants, have strong cell walls that a virus must breach to infect the cell. However, given that bacterial cell walls are much less thick than plant cell walls due to their much smaller size, some viruses have evolved mechanisms that inject their genome into the bacterial cell across the cell wall, while the viral capsid remains outside.[93]

Uncoating is a process in which the viral capsid is removed: This may be by degradation by viral enzymes or host enzymes or by simple dissociation; the end-result is the releasing of the viral genomic nucleic acid.

Replication of viruses involves primarily multiplication of the genome. Replication involves synthesis of viral messenger RNA (mRNA) from "early" genes (with exceptions for positive sense RNA viruses), viral protein synthesis, possible assembly of viral proteins, then viral genome replication mediated by early or regulatory protein expression. This may be followed, for complex viruses with larger genomes, by one or more further rounds of mRNA synthesis: "late" gene expression is, in general, of structural or virion proteins. Following the structure-mediated self-assembly of the virus particles, some modification of the proteins often occurs. In viruses such as HIV, this modification (sometimes called maturation) occurs after the virus has been released from the host cell.[94]

Viruses can be released from the host cell by lysis, a process that kills the cell by bursting its membrane and cell wall if present: This is a feature of many bacterial and some animal viruses. Some viruses undergo a lysogenic cycle

where the viral genome is incorporated by genetic recombination into a specific place in the host's chromosome. The viral genome is then known as a "provirus" or, in the case of bacteriophages a "prophage".[95] Whenever the host divides, the viral genome is also replicated. The viral genome is mostly silent within the host; however, at some point, the provirus or prophage may give rise to active virus, which may lyse the host cells.[96] Enveloped viruses (e.g., HIV) typically are released from the host cell by budding. During this process the virus acquires its envelope, which is a modified piece of the host's plasma or other, internal membrane.[97]

The genetic material within virus particles, and the method by which the material is replicated, varies considerably between different types of viruses.

DNA viruses

The genome replication of most DNA viruses takes place in the cell's nucleus. If the cell has the appropriate receptor on its surface, these viruses enter the cell sometimes by direct fusion with the cell membrane (e.g., herpesviruses) or more usually by receptor-mediated endocytosis. Most DNA viruses are entirely dependent on the host cell's DNA and RNA synthesising machinery, and RNA processing machinery; however, viruses with larger genomes may encode much of this machinery themselves. In eukaryotes the viral genome must cross the cell's nuclear membrane to access this machinery, while in bacteria it need only enter the cell.[98]

RNA viruses

Replication usually takes place in the cytoplasm. RNA viruses can be placed into four different groups depending on their modes of replication. The polarity (whether or not it can be used directly by ribosomes to make proteins) of single-stranded RNA viruses largely determines the replicative mechanism; the other major criterion is whether the genetic material is single-stranded or double-stranded. All RNA viruses use their own RNA replicase enzymes to create copies of their genomes.[99]

Reverse transcribing viruses

These have ssRNA (Retroviridae, Metaviridae, Pseudoviridae) or dsDNA (Caulimoviridae, and Hepadnaviridae) in their particles. Reverse transcribing viruses with RNA genomes (retroviruses), use a DNA intermediate to replicate, whereas those with DNA genomes (pararetroviruses) use an RNA intermediate during genome replication. Both types use a reverse transcriptase, or RNA-dependent DNA polymerase enzyme, to carry out the nucleic acid conversion. Retroviruses integrate the DNA produced by reverse transcription into the host genome as a provirus as a part of the replication process; pararetroviruses do not, although integrated genome copies of especially plant pararetroviruses can give rise to infectious virus.[100] They are susceptible to antiviral drugs that inhibit the reverse transcriptase enzyme, e.g. zidovudine and lamivudine. An example of the first type is HIV, which is a retrovirus. Examples of the second type are the Hepadnaviridae, which includes Hepatitis B virus.[101]

Effects on the host cell

The range of structural and biochemical effects that viruses have on the host cell is extensive.[102] These are called cytopathic effects.[103] Most virus infections eventually result in the death of the host cell. The causes of death include cell lysis, alterations to the cell's surface membrane and apoptosis.[104] Often cell death is caused by cessation of its normal activities because of suppression by virus-specific proteins, not all of which are components of the virus particle.[105]

Some viruses cause no apparent changes to the infected cell. Cells in which the virus is latent and inactive show few signs of infection and often function normally.[106] This causes persistent infections and the virus is often dormant for many months or years. This is often the case with herpes viruses.[107][108] Some viruses, such as Epstein-Barr virus, can cause cells to proliferate without causing malignancy,[109] while others, such as papillomaviruses, are established causes of cancer.[110]

Host range

Viruses are by far the most abundant biological entities on Earth and they

outnumber all the others put together.[111] They infect all types of cellular life including animals, plants, bacteria and fungi.[3] However, different types of viruses can infect only a limited range of hosts and many are species-specific. Some, such as smallpox virus for example, can infect only one species—^ in this case humans,[112] and are said to have a narrow host range. Other viruses, such as rabies virus, can infect different species of mammals and are said to have a broad range.[113] The viruses that infect plants are harmless to animals, and most viruses that infect other animals are harmless to humans.[114] The host range of some bacteriophages is limited to a single strain of bacteria and they can be used to trace the source of outbreaks of infections by a method called phage typing.[115]

Classification

Classification seeks to describe the diversity of viruses by naming and grouping them on the basis of similarities. In 1962, Andr  Lwoff, Robert Horne, and Paul Tournier were the first to develop a means of virus classification, based on the Linnaean hierarchical system.[116] This system bases classification on phylum, class, order, family, genus, and species. Viruses were grouped according to their shared properties (not those of their hosts) and the type of nucleic acid forming their genomes.[117] Later the International Committee on Taxonomy of Viruses was formed. However, viruses are not classified on the basis of phylum or class, as their small genome size and high rate of mutation makes it difficult to determine their ancestry beyond Order. As such, the Baltimore Classification is used to supplement the more traditional hierarchy.

ICTV classification

The International Committee on Taxonomy of Viruses (ICTV) developed the current classification system and wrote guidelines that put a greater weight on certain virus properties to maintain family uniformity. A unified taxonomy (a universal system for classifying viruses) has been established. The 7th ICTV Report formalised for the first time the concept of the virus species as the lowest taxon (group) in a branching hierarchy of viral taxa.[118] However, at present only a small part of the total diversity of viruses has been studied, with analyses of samples from humans finding that about 20% of the virus sequences recovered have not been seen before, and samples from the environment, such as from seawater and ocean sediments, finding that the large majority of sequences are completely novel.[119]

The general taxonomic structure is as follows:

Order (-virales)

Family (-viridae)

Subfamily (-virinae)

Genus (-virus)

Species (-virus)

In the current (2011) ICTV taxonomy, six orders have been established, the Caudovirales, Herpesvirales, Mononegavirales, Nidovirales, Picornavirales and Tymovirales. A seventh order Ligamenvirales has also been proposed. The committee does not formally distinguish between subspecies, strains, and isolates. In total there are 6 orders, 87 families, 19 subfamilies, 349 genera, about 2,284 species and over 3,000 types yet unclassified.[120][121][122]

Baltimore classification

The Nobel Prize-winning biologist David Baltimore devised the Baltimore classification system.[32][123] The ICTV classification system is used in conjunction with the Baltimore classification system in modern virus classification.[124][125][126]

The Baltimore classification of viruses is based on the mechanism of mRNA production. Viruses must generate mRNAs from their genomes to produce proteins and replicate themselves, but different mechanisms are used to achieve this in each virus family. Viral genomes may be single-stranded (ss) or double-stranded (ds), RNA or DNA, and may or may not use reverse transcriptase (RT). In addition, ssRNA viruses may be either sense (+) or antisense (^'). This classification places viruses into seven groups:

As an example of viral classification, the chicken pox virus, varicella zoster (VZV), belongs to the order Herpesvirales, family Herpesviridae, subfamily Alphaherpesvirinae, and genus Varicellovirus. VZV is in Group I of the Baltimore Classification because it is a dsDNA virus that does not use reverse transcriptase.

Role in human disease

Examples of common human diseases caused by viruses include the common cold, influenza, chickenpox, and cold sores. Many serious diseases such as ebola, AIDS, avian influenza, and SARS are caused by viruses. The relative ability of viruses to cause disease is described in terms of virulence. Other diseases are under investigation as to whether they too have a virus as the causative agent, such as the possible connection between human herpesvirus 6 (HHV6) and neurological diseases such as multiple sclerosis and chronic fatigue syndrome.[129] There is controversy over whether the bornavirus, previously thought to cause neurological diseases in horses, could be responsible for psychiatric illnesses in humans.[130]

Viruses have different mechanisms by which they produce disease in an organism, which depends largely on the viral species. Mechanisms at the cellular level primarily include cell lysis, the breaking open and subsequent death of the cell. In multicellular organisms, if enough cells die, the whole organism will start to suffer the effects. Although viruses cause disruption of healthy homeostasis, resulting in disease, they may exist relatively harmlessly within an organism. An example would include the ability of the herpes simplex virus, which causes cold sores, to remain in a dormant state within the human body. This is called latency[131] and is a characteristic of the herpes viruses, including Epstein-Barr virus, which causes glandular fever, and varicella zoster virus, which causes chickenpox and shingles. Most people have been infected with at least one of these types of herpes virus.[132] However, these latent viruses might sometimes be beneficial, as the presence of the virus can increase immunity against bacterial pathogens, such as *Yersinia pestis*. [133]

Some viruses can cause lifelong or chronic infections, where the viruses continue to replicate in the body despite the host's defense mechanisms.[134] This is common in hepatitis B virus and hepatitis C virus infections. People chronically infected are known as carriers, as they serve as reservoirs of infectious virus.[135] In populations with a high proportion of carriers, the disease is said to be endemic.[136]

Epidemiology

Viral epidemiology is the branch of medical science that deals with the transmission and control of virus infections in humans. Transmission of viruses can be vertical, which means from mother to child, or horizontal, which means from person to person. Examples of vertical transmission include hepatitis B virus and HIV, where the baby is born already infected with the virus.[137] Another, more rare, example is the varicella zoster virus, which, although causing relatively mild infections in humans, can be fatal to the foetus and newborn baby.[138]

Horizontal transmission is the most common mechanism of spread of viruses in populations. Transmission can occur when: body fluids are exchanged during sexual activity, e.g., HIV; blood is exchanged by contaminated transfusion or needle sharing, e.g., hepatitis C; exchange of saliva by mouth, e.g., Epstein-Barr virus; contaminated food or water is ingested, e.g., norovirus; aerosols containing virions are inhaled, e.g., influenza virus; and insect vectors such as mosquitoes penetrate the skin of a host, e.g., dengue. The rate or speed of transmission of viral infections depends on factors that include population density, the number of susceptible individuals, (i.e., those not immune),[139] the quality of healthcare and the weather.[140]

Epidemiology is used to break the chain of infection in populations during outbreaks of viral diseases.[141] Control measures are used that are based on knowledge of how the virus is transmitted. It is important to find the source, or sources, of the outbreak and to identify the virus. Once the virus has been

identified, the chain of transmission can sometimes be broken by vaccines. When vaccines are not available, sanitation and disinfection can be effective. Often, infected people are isolated from the rest of the community, and those that have been exposed to the virus are placed in quarantine.[142] To control the outbreak of foot-and-mouth disease in cattle in Britain in 2001, thousands of cattle were slaughtered.[143] Most viral infections of humans and other animals have incubation periods during which the infection causes no signs or symptoms.[144] Incubation periods for viral diseases range from a few days to weeks, but are known for most infections.[145] Somewhat overlapping, but mainly following the incubation period, there is a period of communicability ~ a time when an infected individual or animal is contagious and can infect another person or animal.[145] This, too, is known for many viral infections, and knowledge of the length of both periods is important in the control of outbreaks.[146] When outbreaks cause an unusually high proportion of cases in a population, community, or region, they are called epidemics. If outbreaks spread worldwide, they are called pandemics.[147]

Epidemics and pandemics

Native American populations were devastated by contagious diseases, in particular, smallpox, brought to the Americas by European colonists. It is unclear how many Native Americans were killed by foreign diseases after the arrival of Columbus in the Americas, but the numbers have been estimated to be close to 70% of the indigenous population. The damage done by this disease significantly aided European attempts to displace and conquer the native population.[148]

A pandemic is a worldwide epidemic. The 1918 flu pandemic, which lasted until 1919, was a category 5 influenza pandemic caused by an unusually severe and deadly influenza A virus. The victims were often healthy young adults, in contrast to most influenza outbreaks, which predominantly affect juvenile, elderly, or otherwise-weakened patients.[149] Older estimates say it killed 40~50 million people,[150] while more recent research suggests that it may have killed as many as 100 million people, or 5% of the world's population in 1918.[151]

Most researchers believe that HIV originated in sub-Saharan Africa during the 20th century;[152] it is now a pandemic, with an estimated 38.6 million people now living with the disease worldwide.[153] The Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) estimate that AIDS has killed more than 25 million people since it was first recognised on June 5, 1981, making it one of the most destructive epidemics in recorded history.[154] In 2007 there were 2.7 million new HIV infections and 2 million HIV-related deaths.[155]

Several highly lethal viral pathogens are members of the Filoviridae. Filoviruses are filament-like viruses that cause viral hemorrhagic fever, and include the ebola and marburg viruses. The Marburg virus attracted widespread press attention in April 2005 for an outbreak in Angola. Beginning in October 2004 and continuing into 2005, the outbreak was the world's worst epidemic of any kind of viral hemorrhagic fever.[156]

Cancer

For more details on this topic, see Oncovirus.

Viruses are an established cause of cancer in humans and other species. Viral cancers occur only in a minority of infected persons (or animals). Cancer viruses come from a range of virus families, including both RNA and DNA viruses, and so there is no single type of "oncovirus" (an obsolete term originally used for acutely transforming retroviruses). The development of cancer is determined by a variety of factors such as host immunity[157] and mutations in the host.[158] Viruses accepted to cause human cancers include some genotypes of human papillomavirus, hepatitis B virus, hepatitis C virus, Epstein-Barr virus, Kaposi's sarcoma-associated herpesvirus and human T-lymphotropic virus. The most recently discovered human cancer virus is a polyomavirus (Merkel cell polyomavirus) that causes most cases of a rare form of skin cancer called Merkel cell carcinoma.[159] Hepatitis viruses can develop

into a chronic viral infection that leads to liver cancer.[160][161] Infection by human T-lymphotropic virus can lead to tropical spastic paraparesis and adult T-cell leukemia.[162] Human papillomaviruses are an established cause of cancers of cervix, skin, anus, and penis.[163] Within the Herpesviridae, Kaposi's sarcoma-associated herpesvirus causes Kaposi's sarcoma and body cavity lymphoma, and Epstein-Barr virus causes Burkitt's lymphoma, Hodgkin's lymphoma, B lymphoproliferative disorder, and nasopharyngeal carcinoma.[164] Merkel cell polyomavirus closely related to SV40 and mouse polyomaviruses that have been used as animal models for cancer viruses for over 50 years.[165]

Host defence mechanisms

The body's first line of defence against viruses is the innate immune system. This comprises cells and other mechanisms that defend the host from infection in a non-specific manner. This means that the cells of the innate system recognise, and respond to, pathogens in a generic way, but, unlike the adaptive immune system, it does not confer long-lasting or protective immunity to the host.[166]

RNA interference is an important innate defence against viruses.[167] Many viruses have a replication strategy that involves double-stranded RNA (dsRNA). When such a virus infects a cell, it releases its RNA molecule or molecules, which immediately bind to a protein complex called dicer that cuts the RNA into smaller pieces. A biochemical pathway called the RISC complex is activated, which degrades the viral mRNA and the cell survives the infection. Rotaviruses avoid this mechanism by not uncoating fully inside the cell and by releasing newly produced mRNA through pores in the particle's inner capsid. The genomic dsRNA remains protected inside the core of the virion.[168][169]

When the adaptive immune system of a vertebrate encounters a virus, it produces specific antibodies that bind to the virus and often render it non-infectious. This is called humoral immunity. Two types of antibodies are important. The first, called IgM, is highly effective at neutralizing viruses but is produced by the cells of the immune system only for a few weeks. The second, called IgG, is produced indefinitely. The presence of IgM in the blood of the host is used to test for acute infection, whereas IgG indicates an infection sometime in the past.[170] IgG antibody is measured when tests for immunity are carried out.[171]

Antibodies can continue to be an effective defence mechanism even after viruses have managed to gain entry to the host cell. A protein that is in cells, called TRIM21, can attach to the antibodies on the surface of the virus particle. This primes the subsequent destruction of the virus by the enzymes of the cell's proteasome system.[172]

A second defence of vertebrates against viruses is called cell-mediated immunity and involves immune cells known as T cells. The body's cells constantly display short fragments of their proteins on the cell's surface, and, if a T cell recognises a suspicious viral fragment there, the host cell is destroyed by killer T cells and the virus-specific T-cells proliferate. Cells such as the macrophage are specialists at this antigen presentation.[173] The production of interferon is an important host defence mechanism. This is a hormone produced by the body when viruses are present. Its role in immunity is complex; it eventually stops the viruses from reproducing by killing the infected cell and its close neighbours.[174]

Not all virus infections produce a protective immune response in this way. HIV evades the immune system by constantly changing the amino acid sequence of the proteins on the surface of the virion. These persistent viruses evade immune control by sequestration, blockade of antigen presentation, cytokine resistance, evasion of natural killer cell activities, escape from apoptosis, and antigenic shift.[175] Other viruses, called neurotropic viruses, are disseminated by neural spread where the immune system may be unable to reach them.

Prevention and treatment

Because viruses use vital metabolic pathways within host cells to replicate, they are difficult to eliminate without using drugs that cause toxic effects to

host cells in general. The most effective medical approaches to viral diseases are vaccinations to provide immunity to infection, and antiviral drugs that selectively interfere with viral replication.

Vaccines

Vaccination is a cheap and effective way of preventing infections by viruses. Vaccines were used to prevent viral infections long before the discovery of the actual viruses. Their use has resulted in a dramatic decline in morbidity (illness) and mortality (death) associated with viral infections such as polio, measles, mumps and rubella.[176] Smallpox infections have been eradicated.[177] Vaccines are available to prevent over thirteen viral infections of humans,[178] and more are used to prevent viral infections of animals.[179] Vaccines can consist of live-attenuated or killed viruses, or viral proteins (antigens).[180] Live vaccines contain weakened forms of the virus, which do not cause the disease but, nonetheless, confer immunity. Such viruses are called attenuated. Live vaccines can be dangerous when given to people with a weak immunity, (who are described as immunocompromised), because in these people, the weakened virus can cause the original disease.[181] Biotechnology and genetic engineering techniques are used to produce subunit vaccines. These vaccines use only the capsid proteins of the virus. Hepatitis B vaccine is an example of this type of vaccine.[182] Subunit vaccines are safe for immunocompromised patients because they cannot cause the disease.[183] The yellow fever virus vaccine, a live-attenuated strain called 17D, is probably the safest and most effective vaccine ever generated.[184]

Antiviral drugs

Antiviral drugs are often nucleoside analogues, (fake DNA building-blocks), which viruses mistakenly incorporate into their genomes during replication. The life-cycle of the virus is then halted because the newly synthesised DNA is inactive. This is because these analogues lack the hydroxyl groups, which, along with phosphorus atoms, link together to form the strong "backbone" of the DNA molecule. This is called DNA chain termination.[185] Examples of nucleoside analogues are aciclovir for Herpes simplex virus infections and lamivudine for HIV and Hepatitis B virus infections. Aciclovir is one of the oldest and most frequently prescribed antiviral drugs.[186] Other antiviral drugs in use target different stages of the viral life cycle. HIV is dependent on a proteolytic enzyme called the HIV-1 protease for it to become fully infectious. There is a large class of drugs called protease inhibitors that inactivate this enzyme.

Hepatitis C is caused by an RNA virus. In 80% of people infected, the disease is chronic, and without treatment, they are infected for the remainder of their lives. However, there is now an effective treatment that uses the nucleoside analogue drug ribavirin combined with interferon.[187] The treatment of chronic carriers of the hepatitis B virus by using a similar strategy using lamivudine has been developed.[188]

Infection in other species

Viruses infect all cellular life and, although viruses occur universally, each cellular species has its own specific range that often infect only that species.[189] Some viruses, called satellites, can replicate only within cells that have already been infected by another virus.[48] Viruses are important pathogens of livestock. Diseases such as foot-and-mouth disease and bluetongue are caused by viruses.[190] Companion animals such as cats, dogs, and horses, if not vaccinated, are susceptible to serious viral infections. Canine parvovirus is caused by a small DNA virus and infections are often fatal in pups.[191] Like all invertebrates, the honey bee is susceptible to many viral infections.[192] However, most viruses co-exist harmlessly in their host and cause no signs or symptoms of disease.[2]

Plant viruses

Main article: Plant virus

There are many types of plant virus, but often they cause only a loss of yield, and it is not economically viable to try to control them. Plant viruses are often spread from plant to plant by organisms, known as vectors. These are normally insects, but some fungi, nematode worms, and single-celled organisms

have been shown to be vectors. When control of plant virus infections is considered economical, for perennial fruits, for example, efforts are concentrated on killing the vectors and removing alternate hosts such as weeds.[193] Plant viruses cannot infect humans and other animals because they can reproduce only in living plant cells.[194]

Plants have elaborate and effective defence mechanisms against viruses. One of the most effective is the presence of so-called resistance (R) genes. Each R gene confers resistance to a particular virus by triggering localised areas of cell death around the infected cell, which can often be seen with the unaided eye as large spots. This stops the infection from spreading.[195] RNA interference is also an effective defence in plants.[196] When they are infected, plants often produce natural disinfectants that kill viruses, such as salicylic acid, nitric oxide, and reactive oxygen molecules.[197]

Plant virus particles or virus-like particles (VLPs) have applications in both biotechnology and nanotechnology. The capsids of most plant viruses are simple and robust structures and can be produced in large quantities either by the infection of plants or by expression in a variety of heterologous systems. Plant virus particles can be modified genetically and chemically to encapsulate foreign material and can be incorporated into supramolecular structures for use in biotechnology.[198]

Bacteria

Main article: Bacteriophage

Bacteriophages are a common and diverse group of viruses and are the most abundant form of biological entity in aquatic environments ^ there are up to ten times more of these viruses in the oceans than there are bacteria,[199] reaching levels of 250,000,000 bacteriophages per millilitre of seawater.[200] These viruses infect specific bacteria by binding to surface receptor molecules and then entering the cell. Within a short amount of time, in some cases just minutes, bacterial polymerase starts translating viral mRNA into protein. These proteins go on to become either new virions within the cell, helper proteins, which help assembly of new virions, or proteins involved in cell lysis. Viral enzymes aid in the breakdown of the cell membrane, and, in the case of the T4 phage, in just over twenty minutes after injection over three hundred phages could be released.[201]

The major way bacteria defend themselves from bacteriophages is by producing enzymes that destroy foreign DNA. These enzymes, called restriction endonucleases, cut up the viral DNA that bacteriophages inject into bacterial cells.[202] Bacteria also contain a system that uses CRISPR sequences to retain fragments of the genomes of viruses that the bacteria have come into contact with in the past, which allows them to block the virus's replication through a form of RNA interference.[203][204] This genetic system provides bacteria with acquired immunity to infection.

Archaea

Some viruses replicate within archaea: these are double-stranded DNA viruses with unusual and sometimes unique shapes.[5][77] These viruses have been studied in most detail in the thermophilic archaea, particularly the orders Sulfolobales and Thermoproteales.[205] Defences against these viruses may involve RNA interference from repetitive DNA sequences within archaean genomes that are related to the genes of the viruses.[206][207]

Role in aquatic ecosystems

A teaspoon of seawater contains about one million viruses.[208] They are essential to the regulation of saltwater and freshwater ecosystems.[209] Most of these viruses are bacteriophages, which are harmless to plants and animals. They infect and destroy the bacteria in aquatic microbial communities, comprising the most important mechanism of recycling carbon in the marine environment. The organic molecules released from the bacterial cells by the viruses stimulates fresh bacterial and algal growth.[210]

Microorganisms constitute more than 90% of the biomass in the sea. It is estimated that viruses kill approximately 20% of this biomass each day and that there are 15 times as many viruses in the oceans as there are bacteria and

archaea. Viruses are the main agents responsible for the rapid destruction of harmful algal blooms,[211] which often kill other marine life.[212] The number of viruses in the oceans decreases further offshore and deeper into the water, where there are fewer host organisms.[213]

The effects of marine viruses are far-reaching; by increasing the amount of photosynthesis in the oceans, viruses are indirectly responsible for reducing the amount of carbon dioxide in the atmosphere by approximately 3 gigatonnes of carbon per year.[213]

Like any organism, marine mammals are susceptible to viral infections. In 1988 and 2002, thousands of harbor seals were killed in Europe by phocine distemper virus.[214] Many other viruses, including caliciviruses, herpesviruses, adenoviruses and parvoviruses, circulate in marine mammal populations.[213]

Role in evolution

Viruses are an important natural means of transferring genes between different species, which increases genetic diversity and drives evolution.[7] It is thought that viruses played a central role in the early evolution, before the diversification of bacteria, archaea and eukaryotes and at the time of the last universal common ancestor of life on Earth.[215] Viruses are still one of the largest reservoirs of unexplored genetic diversity on Earth.[213]

Applications

Life sciences and medicine

Viruses are important to the study of molecular and cell biology as they provide simple systems that can be used to manipulate and investigate the functions of cells.[216] The study and use of viruses have provided valuable information about aspects of cell biology.[217] For example, viruses have been useful in the study of genetics and helped our understanding of the basic mechanisms of molecular genetics, such as DNA replication, transcription, RNA processing, translation, protein transport, and immunology.

Geneticists often use viruses as vectors to introduce genes into cells that they are studying. This is useful for making the cell produce a foreign substance, or to study the effect of introducing a new gene into the genome. In similar fashion, virotherapy uses viruses as vectors to treat various diseases, as they can specifically target cells and DNA. It shows promising use in the treatment of cancer and in gene therapy. Eastern European scientists have used phage therapy as an alternative to antibiotics for some time, and interest in this approach is increasing, because of the high level of antibiotic resistance now found in some pathogenic bacteria.[218] Expression of heterologous proteins by viruses is the basis of several manufacturing processes that are currently being used for the production of various proteins such as vaccine antigens and antibodies. Industrial processes have been recently developed using viral vectors and a number of pharmaceutical proteins are currently in pre-clinical and clinical trials.[219]

Materials science and nanotechnology

Current trends in nanotechnology promise to make much more versatile use of viruses. From the viewpoint of a materials scientist, viruses can be regarded as organic nanoparticles. Their surface carries specific tools designed to cross the barriers of their host cells. The size and shape of viruses, and the number and nature of the functional groups on their surface, is precisely defined. As such, viruses are commonly used in materials science as scaffolds for covalently linked surface modifications. A particular quality of viruses is that they can be tailored by directed evolution. The powerful techniques developed by life sciences are becoming the basis of engineering approaches towards nanomaterials, opening a wide range of applications far beyond biology and medicine.[220]

Because of their size, shape, and well-defined chemical structures, viruses have been used as templates for organizing materials on the nanoscale. Recent examples include work at the Naval Research Laboratory in Washington, D.C., using Cowpea Mosaic Virus (CPMV) particles to amplify signals in DNA microarray based sensors. In this application, the virus particles separate the fluorescent dyes used for signalling to prevent the formation of

non-fluorescent dimers that act as quenchers.[221] Another example is the use of CPMV as a nanoscale breadboard for molecular electronics.[222]

Synthetic viruses

Many viruses can be synthesized de novo ("from scratch") and the first synthetic virus was created in 2002.[223] Although somewhat of a misconception, it is not the actual virus that is synthesized, but rather its DNA genome (in case of a DNA virus), or a cDNA copy of its genome (in case of RNA viruses). For many virus families the naked synthetic DNA or RNA (once enzymatically converted back from the synthetic cDNA) is infectious when introduced into a cell. That is, they contain all the necessary information to produce new viruses. This technology is now being used to investigate novel vaccine strategies.[224] The ability to synthesize viruses has far-reaching consequences, since viruses can no longer be regarded as extinct, as long as the information of their genome sequence is known and permissive cells are available. Currently, the full-length genome sequences of 2408 different viruses (including smallpox) are publicly available at an online database, maintained by the National Institutes of Health.[225]

Weapons

The ability of viruses to cause devastating epidemics in human societies has led to the concern that viruses could be weaponised for biological warfare. Further concern was raised by the successful recreation of the infamous 1918 influenza virus in a laboratory.[226] The smallpox virus devastated numerous societies throughout history before its eradication. There are officially only two centers in the world that keep stocks of smallpox virus – the Russian Vector laboratory, and the United States Centers for Disease Control.[227] But fears that it may be used as a weapon are not totally unfounded;[227] the vaccine for smallpox has sometimes severe side-effects – during the last years before the eradication of smallpox disease more people became seriously ill as a result of vaccination than did people from smallpox[228] – and smallpox vaccination is no longer universally practiced.[229] Thus, much of the modern human population has almost no established resistance to smallpox.[227]

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External links

The Shackleton–Rowett Expedition (1921–22) was Sir Ernest Shackleton's last Antarctic project, and the final episode in the Heroic Age of Antarctic Exploration. The venture, financed by businessman John Quiller Rowett, is sometimes referred to as the Quest Expedition after its ship *Quest*, a converted Norwegian sealer. Shackleton's original plan had been to explore the Beaufort Sea sector of the Arctic Ocean, but this was abandoned after the Canadian government withheld financial support. *Quest*, smaller than any recent Antarctic exploration vessel, soon proved inadequate for its task, and progress south was delayed by its poor sailing performance and by frequent engine problems. Before the expedition's work could properly begin, Shackleton died aboard ship, just after its arrival at the sub-Antarctic island of South Georgia.

The major part of the subsequent attenuated expedition was a three-month cruise to the eastern Antarctic, under the leadership of second-in-command Frank Wild. In these waters the shortcomings of *Quest* were soon in evidence: slow speed, heavy fuel consumption, a tendency to roll in heavy seas, and a steady leak. The ship was unable to proceed further than longitude 20°E, well short of its easterly target, and its engine's low power was insufficient for it to penetrate far into the Antarctic ice. Following several fruitless attempts to break southwards through the pack ice, Wild returned the ship to South Georgia, after a nostalgic visit to Elephant Island, where he and 21 others had been stranded after the sinking of the ship *Endurance*, during Shackleton's Imperial Trans-Antarctic Expedition six years earlier.

Wild had thoughts of a second, more productive season in the ice, and took the ship to Cape Town for a refit. Here he received a message from Rowett ordering the ship home to England, so the expedition ended quietly. Although not greatly regarded in the histories of polar exploration, the *Quest* voyage's significance is its standing at the very end of the Heroic Age and the beginning of the "Mechanical Age" that followed. Ultimately, however, the event that defined it in public memory, and overshadowed all its activities, was Shackleton's untimely death.

[edit] Background

[edit] After the *Endurance*

After helping to rescue the various stranded groups of men from his *Endurance* expedition, Shackleton came home to Britain in late May 1917, while World War I was raging. Too old to enlist, he nevertheless sought an active role in the war effort,[1] and eventually departed for Murmansk with the temporary army rank of major, as part of a military mission to North Russia. This role was not satisfying to Shackleton, and he expressed his dissatisfaction in letters home: "I feel I am no use to anyone unless I am outfacing the storm in wild lands." [2] He returned to England in February 1919 and began plans to set up a company that would, with the cooperation of the North Russian Government, develop the natural resources of the region.[3] This scheme came to nothing, as the Red Army took control of that part of Russia during the Russian Civil War, and Shackleton was forced to rely on the lecture circuit to provide him with an income. At the Philharmonic Hall in Great Portland Street, London, during the winter of 1919–20, he lectured twice a day, six days a week, for five months.[4] At the same time, despite the large debts still outstanding from the *Endurance* expedition, he began planning a new exploration venture.[4]

[edit] Canadian proposal

Shackleton had decided to turn away from the Antarctic, go northwards, and "fill in this great blank now called the Beaufort Sea".[5] This area of the Arctic ocean, to the north of Alaska and west of the Canadian Arctic archipelago, was largely unexplored; Shackleton believed, on the basis of tidal

records, that the sea held large undiscovered land masses that "would be of the greatest scientific interest to the world, apart from the possible economic value".[5] He also hoped to reach the northern "pole of inaccessibility", the most remote point in the Arctic regions.[6] In March 1920, his plans received the general approval of the Royal Geographical Society (RGS) and were supported by the Canadian government. On this basis Shackleton set about acquiring the necessary funding, which he estimated at £50,000 (about £1.6 million, 2008 value).[5][7] Later that year, Shackleton met by chance an old school-friend, John Quiller Rowett, who agreed to put up a nucleus of cash to enable Shackleton to get started. With this money Shackleton was able, in January 1921, to acquire the wooden Norwegian whaler Foca I, and to proceed with the purchase of other equipment and the hiring of a crew.[5]

In May 1921 the Canadian plans were abandoned. The policy of the government of Canada on the funding of expeditions changed with the advent of a new Prime Minister, Arthur Meighen, who withdrew support from Shackleton's proposal .[8] Shackleton's response was not to cancel the expedition but to reorient it. In the middle of May his associate Alexander Macklin, who was in Canada negotiating the purchase of dogs, received a telegram notifying him that the destination was now to be the Antarctic; a varied programme of exploration, coastal mapping, mineral prospecting and oceanographic research in southern waters had been substituted for the Beaufort Sea venture.[5]

[edit] Antarctic preparation

[edit] Objectives

Even before his impasse with the Canadian government, Shackleton had been considering a southern expedition as a possible alternative to the Beaufort Sea. According to RGS librarian Hugh Robert Mill, as early as March 1920 Shackleton had talked about two possible schemesâ ~the Beaufort Sea exploration and "an oceanographical expedition with the object of visiting all the little-known islands of the South Atlantic and South Pacific".[9] By June 1921, it had expanded to include a circumnavigation of the Antarctic continent and the mapping of around 2,000 miles (3,200 km) of uncharted coastline. It would also encompass a search for "lost" or wrongly charted sub-Antarctic islands (including Dougherty Island, Tuanaki, and the Nimrod Islands),[10][11] investigations of possible mineral resources to be exploited in these rediscovered lands, and an ambitious scientific research program.[12] This was to include soundings around Gough Island to investigate an alleged "underwater continental connection between Africa and America." [13] Shackleton biographer Margery Fisher calls the plan "diffuse", and "far too comprehensive for one small body of men to tackle within two years".[12] According to biographer Roland Huntford the expedition had no obvious goal and was "only too clearly a piece of improvisation, a pretext [for Shackleton] to get away".[14]

Fisher describes the expedition as representing "the dividing line between what has become known as the Heroic Age of Antarctic exploration and the Mechanical Age".[12] Shackleton called the voyage "pioneering", referring specifically to the aeroplane that was taken (but ultimately not used) on the expedition.[12] In fact this was only one of the technological "firsts" that marked the venture; there were gadgets in profusion. The ship's crew's nest was electrically heated; there were heated overalls for the lookouts, a wireless set, and a device called an odograph which could trace and chart the ship's route automatically.[12] Photography was to figure prominently, and "a large and expensive outfit of cameras, cinematographical machines and general photographic appliances [was] acquired".[15] Among the oceanographical research equipment was a Lucas deep-sea sounding machine.[16]

This ample provision arose from the sponsorship of Rowett, who had extended his original gift of seed money to an undertaking to cover the costs of the entire expedition.[17] The extent of Rowett's contribution is not recorded; in an (undated) prospectus for the southern expedition Shackleton had estimated the total cost as "about £100,000".[12] Whatever the total, Rowett appears to have funded the lion's share, enabling Frank Wild to record later that, unique among Antarctic expeditions of the era, this one returned home without any

outstanding debt.[18][19] According to Wild, without Rowett's actions the expedition would have been impossible: "His generous attitude is the more remarkable in that he knew there was no prospect of financial return, and what he did was in the interest of scientific research and from friendship with Shackleton." [20] His only recognition was the attachment of his name to the title of the expedition.[17] Rowett was, according to Huntford, "a stodgy, prosaic looking" businessman,[21] who was, in 1920, a co-founder and principal contributor to an animal nutrition research institute in Aberdeen known as the Rowett Research Institute (now part of the University of Aberdeen). He had also endowed dental research work at the Middlesex Hospital.[21] Rowett did not live long after the return of the expedition; in 1924, aged 50, he took his own life following an apparent downturn in his business fortunes.[22]

In March 1921, Shackleton renamed his expedition vessel *Quest*. [14] She was a small ship, 125 tons according to Huntford, with sail and auxiliary engine power purportedly capable of making eight knots, but in fact rarely making more than five-and-a-half.[23][24] Huntford describes her as "straight-stemmed", with an awkward square rig, and a tendency to wallow in heavy seas.[14] Fisher reports that she was built in 1917, weighed 204 tons, and had a large and spacious deck.[23][25] Although she had some modern facilities, such as electric lights in the cabins,[26] she was unsuited to long oceanic voyages; Shackleton, on the first day out, observed that "in no way are we shipshape or fitted to ignore even the mildest storm".[27] Leif Mills, in his biography of Frank Wild, says that had the ship been taken to the Beaufort Sea in accordance with Shackleton's original plans, she would probably have been crushed in the Arctic pack ice.[27] On her voyage south she suffered frequent damage and breakdowns, requiring repairs at every port of call.[14]

[edit] Personnel

The Times newspaper had reported that Shackleton planned to take a dozen men to the Arctic, "chiefly those who had accompanied him on earlier expeditions".[5] In actuality, *Quest* left London for the south with 20 men, of whom eight were old Endurance comrades; another, James Dell, was a veteran from the *Discovery*, 20 years previously.[28] Some of the Endurance hands had not been fully paid from the earlier expedition, but were prepared to join Shackleton again out of personal loyalty.[14][29]

Frank Wild, on his fourth trip with Shackleton, filled the second-in-command post as he had on the Endurance expedition. Frank Worsley, Endurance's former captain, became captain of *Quest*. Other old comrades included the two surgeons, Alexander Macklin and James McIlroy, the meteorologist Leonard Hussey, the engineer Alexander Kerr, seaman Tom McLeod and cook Charles Green.[14] Shackleton had assumed that Tom Crean would sign up, and had assigned him duties "in charge of boats", [30] but Crean had retired from the navy to start a family back home in County Kerry, and declined Shackleton's invitation.[30]

Of the newcomers, Roderick Carr, a New Zealand-born Royal Air Force pilot, was hired to fly the expedition's aeroplane, an Avro "Antarctic" Baby: an Avro Baby modified as a seaplane with an 80-horse power engine.[31][32] He had met Shackleton in North Russia, and had recently been serving as Chief of Staff to the Lithuanian air force.[33] In fact, the aeroplane was not used during the expedition due to some missing parts, and Carr therefore assisted with the scientific work.[34] The scientific staff included Australian biologist Hubert Wilkins, who had Arctic experience, and the Canadian geologist Vibert Douglas, who had initially signed for the aborted Beaufort Sea expedition.[34] The recruits who caught the most public attention were two members of the Boy Scouts' movement, Norman Mooney and James Marr. As the result of publicity organised by the Daily Mail newspaper, these two had been selected to join the expedition out of around 1,700 Scouts who had applied to go.[35] Mooney, who was from the Orkney Islands, soon dropped out, leaving the ship at Madeira after suffering chronic seasickness.[36] Marr, an 18-year-old from Aberdeen, remained with the expedition throughout, winning plaudits from Shackleton and Wild for his application to the tasks at hand. After being put to work in the ship's coal bunkers, according to Wild, Marr "came out of the trial very well,

showing an amount of hardihood and endurance that was remarkable".[36]

[edit] Expedition

[edit] Voyage south

Quest sailed from St Katherine's Dock, London, on 17 September 1921, after inspection by King George V.[37] Large crowds gathered on the banks of the river and on the bridges, to witness the event. Marr wrote in his diary that it was as though "all London had conspired together to bid us a heartening farewell".[23]

Shackleton's original intention was to sail down to Cape Town, visiting the main South Atlantic islands on the way. From Cape Town, Quest would head for the Enderby Land coast of Antarctica where, once in the ice, it would explore the coastline in the direction of Coats Land in the Weddell Sea. At the end of the summer season the ship would visit South Georgia before returning to Cape Town for refitting and preparation for the second year's work.[23] However, the ship's performance in the early stages of the voyage disrupted this schedule. Serious problems with the engine necessitated a week's stay in Lisbon, and further stops in Madeira and the Cape Verde Islands.[38] These delays and the slow speed of the ship led Shackleton to decide that it would be necessary to sacrifice entirely the visits to the South Atlantic islands, and instead he turned the ship towards Rio de Janeiro, where the engine could receive a thorough overhaul. Quest reached Rio on 22 November 1921.[38]

The engine overhaul, and the replacement of the damaged topmast,[39] delayed the party in Rio for four weeks. This meant that it was no longer practical to proceed to Cape Town and then on to the ice. Instead, Shackleton decided that the ship would sail directly to Grytviken harbour in South Georgia.[40] Equipment and stores that had been sent on to Cape Town would have to be sacrificed, but Shackleton evidently hoped that this shortfall could be made up in South Georgia.[40] He was vague about the direction the expedition should take after South Georgia; Macklin wrote in his diary, "The Boss says...quite frankly that he does not know what he will do."[41][42]

[edit] Death of Shackleton

On 17 December, the day before Quest was due to leave Rio, Shackleton fell ill. He may have suffered a heart attack;[43] Macklin was called, but Shackleton refused to be examined and declared himself "better" the next morning.[41][44] On the ensuing voyage to South Georgia he was, from the accounts of his shipmates, unusually subdued and listless. He also began drinking champagne each morning, "to deaden the pain", contrary to his normal rule of not allowing liquor at sea.[41] A severe storm ruined the expedition's proposed Christmas celebrations, and a new problem with the engine's steam furnace slowed progress and caused Shackleton further stress.[45] By 1 January 1922, the weather had abated: "Rest and calm after the storm â ^ the year has begun kindly for us", wrote Shackleton in his diary.[46] On 4 January 1922, South Georgia was sighted, and late that morning Quest anchored at Grytviken.

After visiting the whaling establishment ashore, Shackleton returned to the ship apparently refreshed. He told Frank Wild that they would celebrate their deferred Christmas the next day, and retired to his cabin to write his diary.[44][47] "The old smell of dead whale permeates everything", he wrote. "It is a strange and curious place....A wonderful evening. In the darkening twilight I saw a lone star hover, gem like above the bay."[46] Later he slept, and was heard snoring by the surgeon McIlroy, who had just finished his watch-keeping duty.[47] Shortly after 2Â a.m. on the morning of 5 January, Macklin, who had taken over the watch, was summoned to Shackleton's cabin. According to Macklin's diary, he found Shackleton complaining of back pains and severe facial neuralgia, and asking for a painkilling drug. In a brief discussion, Macklin told his leader that he had been overdoing things, and needed to lead a more regular life. Macklin records Shackleton as saying: "You're always wanting me to give up things, what is it I ought to give up?" Macklin replied "Chiefly alcohol, Boss, I don't think it agrees with you." Immediately afterwards Shackleton "had a very severe paroxysm, during which he died".[48][49]

The death certificate, signed by Macklin, gave the cause as "Atheroma of the Coronary arteries and Heart failure"â ~in modern terms, coronary thrombosis.[50] Later that morning Wild, now in command, gave the news to the shocked crew, and told them that the expedition would carry on.[51] The body was brought ashore for embalming before its return to England. On 19 January, Leonard Hussey accompanied the body aboard a steamer bound for Montevideo, but on arrival there he found a message from Lady Shackleton, requesting that the body be returned to South Georgia for burial.[50] Hussey accompanied the body aboard a British steamer, and returned to Grytviken.[50] Here, on 5 March, Shackleton was buried in the Norwegian cemetery; Quest had meantime sailed, so only Hussey of Shackleton's former comrades was present.[52] A rough cross marked the grave, until it was replaced by a tall granite column six years later.[53]

[edit] Voyage to the ice

As leader, Wild had first to decide where the expedition should now go. Kerr reported that the furnace problem was manageable, and after supplementing stores and equipment with what was available in South Georgia, Wild decided to proceed in general accordance with Shackleton's original plans. He would take the ship eastward towards Bouvet Island and then beyond, before turning south to enter the ice as close as possible to Enderby Land, and begin coastal survey work there. The expedition would also investigate an "Appearance of Land" in the mouth of the Weddell Sea, reported by Sir James Clark Ross in 1842, but not seen since. Ultimately, however, progress would depend on weather, ice conditions, and the capabilities of the ship.[54]

Quest left South Georgia on 18 January, heading south-east towards the South Sandwich Islands. There was a heavy swell, such that the overladen ship frequently dipped its gunwales below the waves, filling the waist with water.[56] As they proceeded, Wild wrote that Quest rolled like a log, was leaking and required regular pumping, was heavy on coal consumption, and was slow. All these factors led him, at the end of January, to change his plan. Bouvet Island was abandoned in favour of a more southerly course that brought them to the edge of the pack ice on 4 February.[57]

"Now the little Quest can really try her mettle", wrote Wild, as the ship entered the loose pack.[58] He noted that Quest was the smallest ship ever to attempt to penetrate the heavy Antarctic ice, and pondered on the fate of others. "Shall we escape, or will the Quest join the ships in Davy Jones's Locker?"[58][59] During the days that followed, as they moved southward in falling temperatures, the ice thickened. On 12 February they reached the most southerly latitude they would attain, 69°17'S, and their most easterly longitude, 17°9'E, well short of Enderby Land. Noting the state of the sea ice and fearing being frozen in, Wild "beat a hasty and energetic retreat" to the north and west.[60] Wild still hoped to tackle the heavy ice, and if possible to break through to the hidden land beyond. On 18 February he turned the ship south again for another try, but was no more successful than before.[61] On 24 February, after a series of further efforts had failed, Wild set a course westward across the mouth of the Weddell Sea. The ship would try to visit Elephant Island in the South Shetlands, before returning to South Georgia on the onset of winter.[62]

For the most part, the long passage across the Weddell Sea proceeded uneventfully. Wild and Worsley were not hitting it off, according to Macklin,[63] and there was other discontent among the crew which Wild, in his own account, dealt with by the threat of "the most drastic treatment".[64] On 12 March they reached 64°11'S, 46°4'W, which was the area where Ross had recorded an "Appearance of Land" in 1842, but there was no sign of it, and a depth sounding of over 2,300 fathoms (13,800 ft, 4,200 m.) indicated no likelihood of land nearby.[65] Between 15 and 21 March Quest was frozen into the ice, and the shortage of coal became a major concern. When the ship broke free, Wild set a course directly for Elephant Island, where he hoped that the coal supply could be supplemented by blubber from the elephant seals there.[66] On 25 March the island was sighted. Wild wanted if possible to revisit Cape Wild, the site of the old Endurance expedition camp, but bad weather prevented this.

They viewed the site through binoculars, picking out the old landmarks, before landing on the western coast to hunt for elephant seals.[67] They were able to obtain sufficient blubber to mix with the coal so that, with a favourable wind, they managed to reach South Georgia on 6 April.[67]

[edit] Return

Quest remained in South Georgia for a month, during which time Shackleton's old comrades erected a memorial cairn to their former leader, on a headland overlooking the entrance to Grytviken harbor.[68] Quest finally sailed for South Africa on 8 May. The first port of call, however, was to be Tristan da Cunha, a remote inhabited island to the west and south of Cape Town. Here, on the orders of the Chief Scout, Marr was to present a flag to the local Scout Troop.[69][70] After a rough crossing of the "Roaring Forties", Quest arrived at Tristan da Cunha on 20 May.[71]

During the five-day stay, with the help of some of the islanders, the expedition made brief landings on the small Inaccessible Island, 20 miles (32 km) south-west of Tristan, and visited the even smaller Nightingale Island, collecting specimens.[72] Wild's impressions of the stay at Tristan were not altogether favourable. He noted the appalling squalor and poverty, and said of the population: "They are ignorant, shut off almost completely from the world, horribly limited in outlook." [73] Despite these reservations, the Scout parade and flag presentation took place before Quest sailed on to Gough Island, 200 miles (320 km) to the east.[70] Here members of the expedition took geological and botanical samples.[71] They arrived at Cape Town on 18 June, to be greeted by enthusiastic crowds. The South African Prime Minister, Jan Smuts, gave an official reception for them, and they were honoured at dinners and lunches by local organisations.[71]

They were also met by Rowett's agent, with the message that they should return to England.[74] Wild wrote: "I should have liked one more season in the Enderby Quadrant...much might be accomplished by making Cape Town our starting point and setting out early in the season." [75] However, on 19 July they left Cape Town and sailed northwards. Their final visits were to St Helena, Ascension Island and St Vincent. On 16 September, one year after departure, they arrived at Plymouth Harbour.[76]

[edit] Aftermath

[edit] Assessment

According to Wild, the expedition ended "quietly", although his biographer Leif Mills writes of enthusiastic crowds in Plymouth Sound.[77][78] At the end of his account, Wild expressed the hope that the information they had brought back might "prove of value in helping to solve the great natural problems that still beset us".[77] These results were summarised in five brief appendices to Wild's book.[79] The summaries reflected the efforts of the scientific staff to collect data and specimens at each port of call,[80] and the geological and survey work carried out by Carr and Douglas on South Georgia, before the southern voyage.[81] Eventually a few scientific papers and articles were developed from this material,[82] but it was, in Leif Mills's words, "little enough to show for a year's work".[80]

The lack of a clear, defined expedition objective[83][84] was aggravated by the failure to call at Cape Town on the way south, with the result that important equipment was not picked up. On South Georgia, Wild found little that could make up for this loss - there were no dogs on the island, so no sledging work could be carried out, which eliminated Wild's preferred choice of a revised expedition goal, an exploration of Graham Land on the Antarctic peninsula.[85] The death of Shackleton before the beginning of serious work was a heavy blow, and questions were raised about the adequacy of Wild as his replacement. Some reports have Wild drinking heavily - "practically an alcoholic", according to Shackleton's biographer, Roland Huntford.[86][87] Mills suggests, however, that even if Shackleton had lived to complete the expedition, it is arguable whether, under the circumstances, it could have achieved more than it did under Wild's command.[84] On the voyage south, colleagues had been struck by the changes in Shackleton - his listlessness,

docility and vacillation.[88]

As for technical innovation, the failure of the aeroplane to fly was another disappointment. Shackleton's hopes had been high that he could pioneer the use of this form of transport in Antarctic waters, and he had discussed this issue with the British Air Ministry.[89] According to Fisher's account, essential aeroplane parts had been sent on to Cape Town, but remained uncollected.[90] The long-range, 220-volt wireless equipment did not work properly and was abandoned early on. The smaller, 110-volt equipment worked only within a range of 250 miles (400 km).[20] During the Tristan visit, Wild attempted to install a new wireless apparatus with the help of a local missionary, but this was also unsuccessful.[91]

[edit] End of the Heroic Age

An Antarctic hiatus followed the return of Quest, there being no significant expeditions to the region for seven years.[92] The expeditions that then followed were of a different character from their predecessors, belonging to the "mechanical age" that succeeded the Heroic Age.[93]

At the end of his narrative of the Quest expedition, Wild wrote of the Antarctic: "I think that my work there is done"; he never returned, closing a career which, like Shackleton's, had bracketed the Heroic Age.[76][94] None of the expedition members who were veterans from the Endurance returned to the Antarctic, although Worsley made one voyage to the Arctic in 1925.[95] Of the other crew and staff of Quest, the Australian naturalist Hubert Wilkins became a pioneer aviator in both the Arctic and Antarctic, in 1928 flying from Point Barrow, Alaska to Spitsbergen. He also made several unsuccessful attempts during the 1930s, in collaboration with the American adventurer Lincoln Ellsworth, to fly to the South Pole.[95] James Marr, the Boy Scout, also became an Antarctic regular after qualifying as a marine biologist, joining several Australian expeditions in the late 1920s and 1930s.[96] Roderick Carr, the frustrated pilot, became an Air Marshal in the Royal Air Force.[97]

[edit] Notes and references

- [^] Huntford, p. 649
- [^] Fisher, p. 435
- [^] Fisher, p. 437
- [^] a b Fisher, p. 441
- [^] a b c d e f Fisher, pp. 442â [^]45
- [^] Wild, p. 2
- [^] "Measuring Worth". Institute for the Measurement of Worth.
<http://www.measuringworth.com/ppoweruk/>. Retrieved 21 November 2008.
- [^] Huntford, pp. 680â [^]82
- [^] Mills, p. 287
- [^] Harrington, p. 1
- [^] "Shackleton, Antarctic Explorer, is Dead". The (Spokane) Spokesman-Review.
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- [^] a b c d e f Fisher, pp. 446â [^]49
- [^] "Shackleton to Sail to Antarctic Again". New York Times: p.Â 13. June 29, 1921.
<http://query.nytimes.com/gst/abstract.html?res=9B02E2DE1731EF33A2575AC2A9609C946095D6CF>.
- [^] a b c d e f Huntford, pp. 684â [^]85
- [^] Frank Wild, quoted in Leif Mills, p. 289
- [^] Wild, p. 13
- [^] a b Mills, pp. 287â [^]88
- [^] Wild (Preface)
- [^] Huntford (p. 693) records that Rowett estimated that the expedition had cost him Â£70,000
- [^] a b "The Voyage of the "Quest"". The Geographical Journal 61: 74. February 1923.
- [^] a b Huntford, p. 682

^ "The Agricultural Association, the Development Fund, and the Origins of the Rowett Research Institute" (PDF). British Agricultural History Society. <http://www.bahs.org.uk/46nla4.pdf>. Retrieved 5 November 2008. Footnote, p. 60
 ^ a b c d Fisher, pp. 459â ^61
 ^ Eight knots = 9.2 miles per hour, 14.8 km/h. 5Â½ knots = 6.3 mph, 10.2 mph
 ^ The difference in the figures provided by Huntford and Fisher may represent the distinction between tonnage, a measure of volume, and displacement, a measure of weight.
 ^ Huntford (The Shackleton Voyages), p. 259
 ^ a b Mills, pp. 287â ^90
 ^ Fisher, p. 464
 ^ Another Shackleton loyalist, Ernest Joyce, had fallen out with Shackleton over the money he claimed was owed to him, and was not invited to join the expedition. Tyler-Lewis, pp. 256â ^57
 ^ a b Smith, p. 308
 ^ Riffenburgh, p. 892
 ^ Verdon-Roe, p. 258
 ^ Carr subsequently had a distinguished Royal Air Force career, rising to the rank of Air Marshal and becoming Deputy Chief of Staff (Air) to SHAEF in 1945. Fisher, p. 489
 ^ a b Fisher, pp. 451â ^53
 ^ Fisher, p. 454
 ^ a b Wild, p. 32
 ^ Huntford, p. 683
 ^ a b Mills, pp. 292â ^93
 ^ Wild, p. 44
 ^ a b Fisher, pp. 466â ^67
 ^ a b c Fisher, pp. 471â ^73
 ^ Huntford, p. 688
 ^ Huntford, p. 687
 ^ a b Mills, p. 294
 ^ Fisher, pp. 473â ^76
 ^ a b Shackleton, Ernest. "Diary of the Quest Expedition 1921â ^22". Cambridge: Scott Polar Research Institute. <http://www.spri.cam.ac.uk/library/archives/shackleton/articles/1537,3,9.html>. Retrieved 3 December 2008.
 ^ a b Fisher, pp. 476â ^77
 ^ Macklin diary, quoted by Fisher, p. 477
 ^ Huntford, p. 690
 ^ a b c Fisher, pp. 478â ^81
 ^ Wild, p. 66
 ^ Wild, p. 69
 ^ See Fisher, illustrations pp. 480â ^81
 ^ Wild, pp. 73â ^75 and 78â ^79
 ^ Based on Wild, pp. 98â ^137
 ^ Wild, pp. 82â ^87
 ^ Wild, pp. 88â ^91 and p. 98
 ^ a b Wild, pp. 98â ^99
 ^ Davy Jones's Locker is the traditional seaman's euphemism for the bottom of the sea.
 ^ Wild, pp. 115â ^21
 ^ Wild, p. 132
 ^ Wild, p. 136
 ^ Mills, p. 303
 ^ Wild, pp. 137â ^39
 ^ Wild, p. 144
 ^ Mills, p. 304
 ^ a b Mills, p. 305
 ^ Fisher, pp. 482â ^83
 ^ "Shackleton-Rowett Expedition 50th anniversary, Tristan da Cunha". Scouts on

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Retrieved 28 November 2008.

^ a b Wild, p. 232

^ a b c Mills, pp. 306â ^08

^ Wild, pp. 206â ^14

^ Wild, p. 207

^ Fisher, p. 483

^ Wild, p. 287

^ a b Wild, p. 313

^ a b Wild, pp. 312â ^13

^ Mills, p. 308

^ Wild, pp. 321â ^49

^ a b Mills, p. 307

^ Wild, p. 80

^ Fisher, pp. 516â ^17

^ Huntford, p. 464

^ a b Mills, p. 330

^ Wild, pp. 74â ^75

^ Huntford, p. 693

^ Mills, p. 297

^ Huntford, pp. 687â ^88

^ Fisher, pp. 447â ^48

^ Fisher, p. 452

^ Wild, p. 214

^ "An Antarctic Time Line 1519â ^1959". www.southpole.com.

<http://www.south-pole.com/p0000052.htm>. Retrieved 30 November 2008.

^ Fisher, p. 449

^ Wild was a member of the Discovery Expedition, 1901â ^04; the Nimrod Expedition, 1907â ^09; the Australasian Antarctic Expedition 1911â ^13; the Imperial Trans-Antarctic Expedition, 1914â ^17, and the Shackleton-Rowett Expedition.

^ a b Fisher, p. 494

^ Fisher, p. 492

^ Fisher, p. 489

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Coordinates: 64°11′S 46°04′W﻿ / ﻿64.183°S 46.067°W﻿ / -64.183; -46.067

Unknown (also known as Unknown Worlds) was an American pulp fantasy fiction magazine, published from 1939 to 1943 by Street & Smith, and edited by John W. Campbell. Unknown was a companion to Street & Smith's science fiction pulp, Astounding Science Fiction, which was also edited by Campbell at the time; many authors and illustrators contributed to both magazines. The leading fantasy magazine in the 1930s was Weird Tales, which focused on shock and horror. Campbell wanted to publish a fantasy magazine with more finesse and humor than Weird Tales, and put his plans into action when Eric Frank Russell sent him the manuscript of his novel Sinister Barrier, about aliens who own the human race. Unknown's first issue appeared in March 1939; in addition to Sinister Barrier, it included H. L. Gold's "Trouble With Water", a humorous fantasy about a New Yorker who meets a water gnome. Gold's story was the first of many in Unknown to combine commonplace reality with the fantastic.

Campbell required his authors to avoid simplistic horror fiction and insisted that the fantasy elements in a story be developed logically: for example, Jack Williamson's "Darker Than You Think" describes a world in which there is a scientific explanation for the existence of werewolves. Similarly, L. Sprague de Camp and Fletcher Pratt's Harold Shea series, about a modern American who finds himself in the worlds of various mythologies, depicts a system of magic based on mathematical logic. Other notable stories included several well-received novels by L. Ron Hubbard and short stories such as Manly Wade Wellman's "When It Was Moonlight" and Fritz Leiber's "Two Sought Adventure", the first in his Fafhrd and the Gray Mouser series.

Unknown was forced to a bimonthly schedule in 1941 by poor sales, and cancelled in 1943 when wartime paper shortages became so acute that Campbell had to choose between turning Astounding into a bimonthly or ending Unknown. The magazine is generally regarded as the finest fantasy fiction magazine ever published, despite the fact that it was not commercially successful, and in the opinion of science fiction historian Mike Ashley it was responsible for the creation of the modern fantasy publishing genre.

[edit] Background and publication history

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Issues of Unknown, showing volume/issue number. John W. Campbell was editor throughout.[1]

In May 1923, the first issue of Weird Tales appeared, from Rural Publications in Chicago. Weird Tales was a pulp magazine that specialized in fantasy stories and material that no other magazine would accept. It was not initially successful, but by the 1930s had established itself and was regularly publishing science fiction (sf) as well as fantasy.[2]Weird Tales was the first magazine to focus solely on fantasy, and it remained the pre-eminent magazine in this field for over a decade.[3][4] In the meantime, science fiction was starting to form a separately marketed genre, with the appearance in 1926 of Amazing Stories, a pulp magazine edited by Hugo Gernsback. In 1930 pulp publisher Clayton Publications launched Astounding Stories of Super Science,[5] but the company's bankruptcy in 1933 led to the acquisition of the magazine by

Street & Smith.[6] The title was shortened to *Astounding Stories*, and it became the leading magazine in the science fiction field over the next few years under the editorship of F. Orlin Tremaine.[7][8] At the end of 1937 John W. Campbell took over as editor.[8]

By 1938, Campbell was planning a fantasy companion to *Astounding*: [9] *Weird Tales* was still the leader in the fantasy genre, though competitors such as *Strange Stories* were also being launched.[4] Campbell began acquiring stories suitable for the new magazine, without a definite launch date in mind. When Eric Frank Russell sent him the manuscript of his novel *Sinister Barrier*, Campbell decided it was time to put his plans into action. The first issue of *Unknown* appeared in March 1939. It was a monthly at first, but poor sales forced a switch to a bimonthly schedule beginning in February 1941.[9][10] In December 1940 the subtitle *Fantasy Fiction* was added, and in October 1941 the main title was changed to *Unknown Worlds*; [9] both changes were intended to make the genre of the magazine clearer to potential readers.[11] When wartime paper shortages became severe in late 1943, Campbell made the choice to keep *Astounding* monthly and cancel *Unknown*, rather than switch the former to a bimonthly schedule as well. The last issue was dated October 1943.[9][10]

[edit] Contents and reception

Campbell's plans for *Unknown* were laid out in the February 1939 issue of *Astounding*, in the announcement of the new magazine. He argued that "it has been the quality of the fantasy that you have read in the past that has made the very word anathema ... [*Unknown*] will offer fantasy of a quality so far different from that which has appeared in the past as to change your entire understanding of the term".[9] The first issue, the following month, led with Russell's *Sinister Barrier*, [note 1] the novel that had persuaded Campbell to set his plans for a fantasy magazine into motion: the plot, involving aliens who own the human race, [9] has been described by sf historian Mike Ashley as "a strange mixture of science fiction and occult fantasy".[4] Campbell asked Russell for revisions to the story to emphasize the fantastic elements, but still demanded that Russell work out the logical implications of his premises. This became a defining characteristic of the fiction published in *Unknown*; in Ashley's words, Campbell "brought the science fiction rationale to fantasy".[4] The first issue also contained Horace L. Gold's "Trouble with Water", a comic fantasy about a modern New Yorker who offends a water gnome; in its whimsicality and naturalistic merging of a modern background with a classic fantasy trope, "Trouble with Water" was a better indication than *Sinister Barrier* of the direction *Unknown* would take.[12] Campbell commented in a letter at the time that *Sinister Barrier*, "Trouble with Water", and "'Where Angels Fear ...'" by Manly Wade Wellman were the only stories in the first issue that accurately reflected his goals for the magazine.[13][note 2]

Under Campbell's editorial supervision, the fantasy element in *Unknown* stories had to be treated rigorously.[12] This naturally led to the appearance in *Unknown* of writers already comfortable with similar rigor in science fiction stories, and Campbell soon established a small group of writers as regular contributors, many of whom were also appearing in the pages of *Astounding*. [12] L. Ron Hubbard, Theodore Sturgeon, and L. Sprague de Camp were among the most prolific.[9][12] Hubbard contributed eight lead novels including *Typewriter in the Sky*, *Slaves of Sleep*, and *Fear*, described by Ashley as a "classic psychological thriller"; [12] sf historian and critic Thomas Clareson describes all eight as "outstanding".[9] De Camp, in collaboration with Fletcher Pratt, contributed three stories featuring Harold Shea, who finds himself in a world where magic operates by rigorous rules.[9][14] The title of one of these, "The Mathematics of Magic", is, according to sf critic John Clute, "perfectly expressive of the terms under which magic found easy mention in *Unknown*".[15]

Other *Astounding* writers who wrote for *Unknown* included Robert A. Heinlein, whose "The Devil Makes the Law" (reprinted as "Magic, Inc.") depicts a world where magic is a part of normal everyday life.[12] Heinlein also contributed "The Unpleasant Profession of Jonathan Hoag" and "They", described by Ashley as

"perhaps the ultimate solipsist fantasy".[16]A.E. van Vogt, a frequent Astounding contributor, appeared in the final issue with "The Book of Ptath" (later expanded into a novel).[12][17]Isaac Asimov, despite multiple attempts to write for Unknown, never appeared in the magazine. On his sixth attempt, he sold "Author! Author!" to Campbell, but the magazine was cancelled before it could appear.[18] It eventually appeared in the anthology The Unknown Five.[19]

In addition to the overlap between the writers of Unknown and Astounding, there was a good deal of overlap between their readerships:[20] Asimov records that during the war, he read only these two magazines.[21][note 3] Sf historian Paul Carter has argued that in fact the spectrum of fantastic fiction from Weird Tales through Unknown to Astounding was far less cleanly separated than is sometimes assumed: many stories in the early science fiction magazines such as Wonder Stories were more like the works of Edgar Allan Poe than they were tales of scientific imagination.[20]

Fritz Leiber's first published story was "Two Sought Adventure", which appeared in the August 1939 issue of Unknown; this was the first story in his long-running Fafhrd and the Gray Mouser series about a pair of adventurers in a sword and sorcery setting. Four more Fafhrd and the Gray Mouser stories appeared in Unknown in as many years, and Leiber's novel Conjure Wife, about a man who discovers that all women are secretly witches, was the lead story in the April 1943 issue. The protagonist, a university professor, "is forced to abandon scepticism and discover the underlying equations of magic, via symbolic logic", in critic David Langford's description.[22] Leiber also contributed "Smoke Ghost" in October 1941, described by Ashley as "arguably the first seriously modern ghost story".[14] Another writer whose first story appeared in Unknown was James H. Schmitz, whose "Greenface" appeared in the August 1943 issue.[17][23]

Other notable stories that appeared in Unknown include Jack Williamson's "Darker Than You Think" (December 1940), which provides a scientific basis for a race of werewolves living undetected alongside human beings. Expanded into a novel in 1948, it remains Williamson's best-known fantasy, and sf historian Malcolm Edwards comments that the two protagonists' relationship is "depicted with a tortured (and still haunting) erotic frankness unusual in genre literature of the 1940s".[4][24] In addition to the Harold Shea pieces, de Camp published several other well-received stories, including "The Wheels of If" (October 1940) and "Lest Darkness Fall" (December 1939), an alternate history story about a time-traveler who attempts to save the Roman Empire from the coming Dark Ages; Edwards and Clute comment that the story is "the most accomplished early excursion into history in magazine sf, and is regarded as a classic".[15][25] Also highly regarded is Wellman's "When It Was Moonlight" (December 1940), a story about Poe.[4]

The first sixteen issues of Unknown had cover paintings, but from July 1940 the cover style was changed to a table of contents, with a small ink drawing usually accompanying the summary of each story, in an attempt to make the magazine appear more dignified.[12][17] The cover art came almost entirely from artists who did not contribute to many science fiction or fantasy magazines: six of the sixteen paintings were by H. W. Scott; Manuel Islip, Modest Stein, Graves Gladney, and Edd Cartier provided the others. Cartier was the only one of these who regularly contributed to sf and fantasy periodicals; he painted four of Unknown's last six covers before the change to a text-heavy design.[26]

[edit] Influence

Unknown was, along with Weird Tales, an important early influence on the fantasy genre.[14] In the foreword to From Unknown Worlds, in 1948, Campbell commented that fantasy before Unknown had been too much infused with "gloom and terror"; his approach in Unknown had been to assume that the "creatures of mythology and folklore" could be characters in an amusing tale as easily as they could be made part of a horror story. Horror stories, he said, had a place, but "horror injected with a sharp and poisoned needle is just as effective as when applied with the blunt-instrument technique of the so-called Gothic horror tale". Campbell insisted on the same rational approach to fantasy

that he required of his science fiction writers, and in the words of Clareson, this led to the destruction of "not only the prevalent narrative tone but also most of the trappings that had dominated fantasy from The Castle of Otranto and The Monk through the nineteenth century to Weird Tales".[9]Unknown quickly separated itself from Weird Tales, whose fantasies still primarily aimed to produce fear or shock. The closest predecessor to Unknown was Thorne Smith, whose prohibition-era "Topper" stories also mixed fantasy with humor.[14] Before Unknown, fantasy had received little serious attention, though on occasion writers such as James Branch Cabell had achieved respectability.[14] In Ashley's opinion, Unknown created the modern genre of fantasy,[14] though commercial success for the genre had to wait until the 1970s.[27]

Clareson also suggests that Unknown influenced the science fiction that appeared in Astounding after Unknown folded. According to this view, stories such as Clifford Simak's City series would not have appeared without the destruction of genre boundaries that Campbell oversaw. Clareson further proposes that Galaxy Science Fiction and The Magazine of Fantasy & Science Fiction, two of the most important and successful science fiction and fantasy magazines, were direct descendants of Unknown.[9]

Unknown is widely regarded as the finest fantasy magazine ever published:[14] Ashley says, for example, that "Unknown published without doubt the greatest collection of fantasy stories produced in one magazine." [28] Despite its lack of commercial success, Unknown is the most lamented of all science fiction and fantasy magazines; Lester del Rey describes it as having gained "a devotion from its readers that no other magazine can match".[29] Edwards comments that Unknown "appeared during Campbell's peak years as an editor; its reputation may stand as high as it does partly because it died while still at its best".[12]

In a conversation with David G. Hartwell in 1962, Shirley Jackson stated she owned a complete run of Unknown and expressed strong admiration for the publication, stating "It's the best".[30]

[edit] Bibliographic details

Spring

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Autumn

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Dec

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Issues of the British reprint of *Unknown*, showing volume/issue number.
Underlining indicates that an issue was dated with the season ("Spring 1945") rather than the month. John W. Campbell was editor throughout.[1]

Unknown was edited by John W. Campbell and published by Street & Smith Publications throughout its run. It was pulp-sized from its launch through August 1941, and then bedsheet-sized from October 1941 to April 1943. The last three issues were pulp-sized again.[9] Street & Smith had planned to switch it to digest size with the December 1943 issue, but it was cancelled before that issue appeared.[12] The price began at 20 cents and rose to 25 cents with the change to bedsheet size; it remained at 25 cents when the size changed back to pulp. It had 164 pages when pulp-sized and 130 pages while it was bedsheet-sized. It began as a monthly and switched to bimonthly from December 1940 on.[9] The volume numbering was regular, with six volumes of six numbers and a final volume of three numbers.[1]

The first six U.S. issues were available directly in the UK, but thereafter an abridged British reprint edition was issued by Atlas Publications, beginning in September 1939. It was pulp-sized, and priced at 9d (nine pence) throughout. It appeared on a regular monthly schedule until December 1940, after which the schedule became quite irregular, with two or three issues appearing each year until 1949. The volume numbering initially followed the corresponding U.S. editions, with some omitted numbers in 1942 and 1943, and then disappeared for four issues; from the twenty-eighth issue (Spring 1945) the magazine was

numbered as if it had been given volumes of twelve numbers since the start of the run. The title was changed from Unknown to Unknown Worlds with the March 1942 issue.[1][9]

[edit] Related publications

In 1948, Street & Smith reprinted several stories from Unknown in a bedsheet-sized magazine format, priced at 25 cents, with the title From Unknown Worlds. This was an attempt to determine if there was a market for a revived Unknown.[1][31] Street & Smith printed 300,000 copies, against the advice of John Campbell, but although it sold better than the original, too many copies were returned for the publisher to be willing to revive the magazine.[31] The issue was reprinted in Britain in 1952, reduced in size to 7 by 9.5 inches (180 mm × 240 mm) and cut from 130 pages to 124; it was priced at 2/6 (two shillings and six pence). Part of the run was issued in a hardcover binding at a higher price. One story from the U.S. version was omitted: "One Man's Harp" by Babette Rosmond.[1][9][32]

Three anthologies of stories from Unknown were published in the early 1960s.[12][19][33] The Unknown Five includes four stories reprinted from Unknown and the first print appearance of "Author! Author!", by Isaac Asimov, which was sold to Unknown shortly before Street & Smith shut it down.[18]

Year

Editor

Title

Publisher

Length and price

1963

D. R. Bensen

The Unknown

Pyramid: New York

192 pp.; 50 cents

1963

George Hay

Hell Hath Fury

Neville Spearman: London

240 pp.; 15/-

1964

D. R. Bensen

The Unknown Five

Pyramid: New York

190 pp.; 50 cents

^ Russell's original title was Forbidden Acres.[4]

^ In the letter, to early contributor L. Ron Hubbard, Campbell asks Hubbard for a story with an Arabian Nights theme and comments that "Death Sentence" by Robert Moore Williams and "Dark Vision" by Frank Belknap Long are next in quality, while "Who Wants Power?" by Mona Farnsworth and "Closed Doors" by A. MacFadyen Jr. were merely "filling space ... acceptably".[13]

^ Asimov regarded Unknown as his favorite magazine and always kept up to date reading it, while he might be several issues behind on reading Astounding.[21]

^ a b c d e f "Unknown Worlds", in Tuck, Encyclopedia of Science Fiction and Fantasy, Vol. 3, pp. 582â 583.

^ Robert Weinberg, "Weird Tales", in Tynn & Ashley, Science Fiction, Fantasy and Weird Fiction Magazines, pp. 727â 736.

^ Ashley, Time Machines, p. 41.

^ a b c d e f g Ashley, Time Machines, pp. 140â 141.

^ Ashley, Time Machines, p. 69.

^ Ashley, Time Machines, p. 82.

^ Ashley, Time Machines, pp. 84â 85.

^ a b Albert I. Berger & Mike Ashley, "Analog Science Fiction/Science

Fact", in Tymn & Ashley, Science Fiction, Fantasy and Weird Fiction Magazines, pp. 60-103.

^ a b c d e f g h i j k l m n o Thomas D. Clareson, "Unknown", in Tymn & Ashley, Science Fiction, Fantasy and Weird Fiction Magazines, pp. 694-699.

^ a b Asimov, In Memory Yet Green, p. 390.

^ Kyle, Pictorial History of Science Fiction, p. 109.

^ a b c d e f g h i j k Malcolm Edwards, "Unknown", in Clute & Nicholls, Encyclopedia of Science Fiction, pp. 1258-1259.

^ a b Chapdelaine, John W. Campbell Letters, p. 44.

^ a b c d e f g Mike Ashley, Unknown, in Clute & Grant, Encyclopedia of Fantasy, p. 974.

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The 2009 Giro d'Italia was the 92nd running of the Giro d'Italia, one of cycling's Grand Tours. It was held from 9 to 31 May 2009, and marked the 100th year since the first edition of the race. Starting in Venice and finishing in Rome,[2] 22 teams competed over 21 stages.

The Giro was raced on a unique path through Italy, taking the peloton to some historic cities and towns in Italian cycling. Though the route lacked any well-known, storied climbs, the many intermediate and mountain stages in the second and third weeks of the race proved deceptively difficult.[3] The 10th and the 16th stages were both called the race's queen stage, as both contained multiple difficult mountain climbs.

Riders protested during the ninth stage, a criterium in Milan. This protest was nominally about the overall safety conditions of the stage, and was sparked by life-threatening injuries sustained by Pedro Horrillo the day before. In the protest, riders declined to contest the stage except for a final sprint finish, a decision that proved controversial with race organizers and fans.

Denis Menchov won the race, having taken the lead in a long time trial in stage 12, and defended vigorously against attacks by his closest challenger, Danilo Di Luca, during the mountain stages of the final week.[4] Di Luca came in second, 41 seconds behind the winner, and won the mauve jersey as points classification winner. Subsequent to the Giro, both he and third-place finisher Franco Pellizotti became embroiled in doping scandals, were given bans, and had their results stripped.[5][6]

Twenty-two teams were announced for the Giro. These included fifteen ProTour teams, and seven Professional Continental teams. Three ProTour teams did not wish to participate, and were thus not invited: Cofidis, Euskaltel-Euskadi, and Française des Jeux.[7] Conversely, the organizers of the race originally declined to invite Fuji-Servetto,[8] but changed this decision on 23 April, inviting them as the Giro's 22nd and final team.[9] Each team sent a squad of nine riders, so the Giro began with a peloton of 198 cyclists.[10]

The 22 teams that took part in the race were:[11]

[edit] Race previews and favorites

The Astana team did not include 2008 race champion Alberto Contador, who chose not to defend his championship,[12] but did include Lance Armstrong, who had recently returned from retirement.[13] Though his appearance was put in doubt after he crashed out of stage 1 of the Vuelta a Castilla y León and broke his collarbone, Armstrong announced on 16 April that he would start the Giro despite undergoing surgery for his injury.[14] Silence-Lotto star Cadel Evans was originally announced to be taking part in the Giro,[15] but he publicly announced shortly afterward that he would not ride it, and accused RCS Sport (the organizers of the race) of using his name to promote the event.[16] Contador and Evans both chose to focus on the Tour de France later in the season.[12][16]

Many riders were named as contenders, including Ivan Basso, Levi Leipheimer, Armstrong, Damiano Cunego, Carlos Sastre, Gilberto Simoni, Danilo Di Luca,

Marzio Bruseghin, and Denis Menchov.[17] Before his collarbone injury, Armstrong was considered an overall favorite, and it was also noted that three time trials, including the insertion of an unusually long time trial mid-race, might favor him.[3] Pre-race analysis noted that Armstrong, when on his best form, would be a rider very likely to gain from having such a long race against the clock included in the Giro.[18]

Former winner Stefano Garzelli named Leipheimer as the favorite,[19] as did some American media outlets.[20][21] Armstrong considered Basso to be the favorite when speaking about the Giro in December 2008.[22] Other news outlets also referred to Basso as the pre-race favorite.[23][24]

Only a small number of stages were expected to end in a sprint, barring a successful breakaway.[2] Sprinters in the event included Mark Cavendish, Alessandro Petacchi, Allan Davis, Filippo Pozzato, Robert Hunter, Robert Förster, Tyler Farrar, Juan José Haedo, and Oscar Gatto.[25]

[edit] Route and stages

The first Giro d'Italia was held in 1909, and the 2009 route was designed to commemorate the 100th anniversary, though interruptions due to World War I and World War II meant this was only the 92nd race.[18] Milan, which had for years been the city in which the Giro concluded,[26] was the site of a ten-lap criterium on the same circuit that began the first Giro d'Italia.[18] Every city that hosted a stage start or finish in the first Giro was visited in 2009 with the exception of Genoa, although Arenzano (in the province of Genoa) hosted the finish to stage 11. The 11th stage also went over the Passo del Turchino, a climb used every year in the classic cycling race Milan â ^ San Remo.[18]

The tenth stage was planned to mimic stage 17 of the 1949 Giro d'Italia, which was won by Italian cycling legend Fausto Coppi en route to the overall victory.[27] That route originally included the Col d'Izoard, a climb in France which has been featured in the Tour de France numerous times. Race organizers were forced to alter this stage to cover only the Italian side of the Alps rather than also visit France, as there were concerns over radio communication in the area, and the roads stood the risk of landslides.[28] It was subsequently made longer than first planned, with an additional, shorter climb added.[29] Stages 10 and 16, the latter of which went over Monte Petrano and two other first-category climbs, were both called the race's queen stage.[30][31]

The route received a small amount of criticism for failing to include any well-known and especially difficult climbs such as the Passo del Mortirolo or Monte Zoncolan, instead including stages featuring multiple climbs with lesser ascents. Race director Angelo Zomegnan responded to the criticism by saying, "I won't follow the philosophy that the selection of climbs has to be determined by their names." [3]

The 21 stages of the 2009 Giro d'Italia were divided into five categories: one team time trial, seven flat stages, four intermediate stages, seven mountain stages and two individual time trials.[2] The type of stage together with the average speed of the winner decided how much time each cyclist would be allowed to finish that stage before being eliminated from the race.[32]

[edit] Race overview

The Giro began with a team time trial in Lido, a barrier island in the city of Venice. The starting order of the teams was decided by a random draw. Team Columbia-High Road, the first team to take the course, won the stage, giving their star sprinter Mark Cavendish the first pink jersey as leader of the race.[34] Cavendish was defeated in a sprint finish the following day by Italian Alessandro Petacchi, who was riding for the LPR Brakes-Farnese Vini team.[36] Petacchi became the next wearer of the pink jersey, after he won the Stage 3 sprint into Valdobbiadene.[37] Cavendish went on to win three mass-start stages,[38][39][40] but Team Columbia-High Road's success was not limited to Cavendish's victories nor the team time trial, as Edvald Boasson Hagen[41] and Kanstantsin Siutsou[42] also took stage wins.

The first two high mountain stages of the Giro revealed the men who would

battle for the overall race title. Danilo Di Luca of LPR Brakes-Farnese Vini took the win in Stage 4, and put himself just 2Â seconds off the pink jersey.[43] The next day, he claimed the jersey, when he was second to stage winner Denis Menchov at Alpe di Siusi as an elite group of favorites emerged including Menchov, Di Luca, and others who had performed well on the climb and were in high places in the overall standings.[44]

Menchov was fifth after Alpe di Siusi, but rose to second before stage 12, the very long and hilly individual time trial in Cinque Terre. There, he claimed a convincing victory; only Levi Leipheimer finished within a minute of Menchov's winning time. Di Luca was nearly two minutes slower than him, finished sixth on the stage, and fell to second overall, with Menchov assuming the race lead.[45] Di Luca tried repeatedly to shed Menchov during the remaining mountain stages to make up the time difference, which was never more than a minute. The two riders were involved in sprints for time bonuses at the finish line in stages 16[46] and 17,[47] as well as an intermediate sprint in stage 20.[48] Menchov was consistently quicker than Di Luca in these sprints. With his superior time-trial skills providing the difference in the final stage, the Russian was able to emerge as Giro champion, despite a dramatic fall in the final kilometre before the finish line.[49]

Stefano Garzelli was the winner of the mountains classification, gaining points for consistent high placings on the summit stage finishes, as well as a brief breakaway on the mountainous stage 10. The points classification was won by Di Luca, after he finished in the top ten in eight of the road stages. The youth classification was won by Kevin Seeldraeyers, who remained consistent after Thomas L  kvist lost nearly 25 minutes on stage 16.[46][49] L  kvist had, for one day earlier in the race, led not just the youth but also the general classification.[43]

Controversy arose during the ten-lap Milan criterium of the ninth stage, when the riders staged a protest over what they viewed as unsafe riding conditions in that stage and those that preceded it. The most visible cause for the protest was Rabobank rider Pedro Horrillo's accident during the eighth stage; Horrillo sustained numerous fractures and head injuries after tumbling over a barricade on the roadside while descending the Culmine di San Pietro. Horrillo fell more than 60   m (200   ft),[50] and nearly died as a result of his injuries.[51] After spending five weeks in hospitals in both Italy and his native Spain, Horrillo eventually recovered,[52] though the day on the Culmine di San Pietro was his last as a professional cyclist, as he retired before the 2010 season began.[53]

The protest at first only involved the criterium being neutralized       that is, the race director agreed that each rider would receive the same finishing time as the stage winner regardless of when they actually crossed the line.[54] After the riders rode a lap of the course, they decided instead not to contest the stage at all, riding the first six circuits 20   km/h (12   mph) slower than previous stages. After four laps, they stopped altogether as race leader Di Luca addressed the unhappy crowd to explain their actions.[55] The times for the stage did not count, and there was no aggressive riding until a final sprint finish.[55] Along with Di Luca, Lance Armstrong was considered the principal voice speaking for the peloton on this day.[56] Although the protest was referred to by some as "unanimous,"[55] cyclists such as Filippo Pozzato, who was himself bearing injuries sustained in a crash that would later force him to leave the race, said the riders had been too hasty in their decision, and that it should have been made conclusively before the stage began.[57] Armstrong apologized to the fans for the effect the protest had on what was supposed to be a grand spectacle,[58] but also contended that it was the correct decision for the peloton to make.[59]

Success in stages was limited to a few teams. Though there were nearly as many stages (21) as teams in the event (22), only eight teams ultimately came away with stage victories. Six different riders won multiple stages       Cavendish, Petacchi, Menchov, Di Luca,[43][60] Carlos Sastre,[46][61] and Michele Scarponi.[62][63] Teammates of Sastre, Scarponi and Cavendish were also stage

winners; Sastre's Cerv lo TestTeam provided the winners to stages 14 (Simon Gerrans)[64] and 21 (Ignatas Konovalovas),[49] and Scarponi's teammate Leonardo Bertagnolli was the winner of stage 15.[65] The only teams to be single stage winners were Liquigas with Franco Pellizotti in stage 17,[47] and Silence-Lotto with classics specialist Philippe Gilbert three days later in a stage thought to resemble a classic.[48] Pellizotti was also the third-place overall finisher. With wins for Quick Step's Seeldraeyers in the youth classification, Garzelli of Acqua & Sapone in the climbers' competition, and Astana in the Trofeo Fast Team ranking, 11 teams   half of the total entries   won significant prizes during the race.[66]

[edit] Aftermath

About two months after the event concluded, on 22 July, it was announced that second place overall finisher and points classification winner Di Luca had given two positive tests for continuous erythropoietin receptor activator (CERA, an erythropoietin derivative) on 20 and 28 May, before the Cinque Terre time trial and the Mount Vesuvius stage in the race's final week.[5] He was provisionally suspended with immediate effect by the Union Cycliste Internationale (UCI), cycling's governing body.[5] It was announced on 8 August that the analyses of the B-samples from those controls confirmed the initial results, making it likely that Di Luca will be stripped of some or all of his results from the race.[67][68] LPR Brakes-Farnese Vini fired him on 13 August.[69] Di Luca at first maintained his innocence and claimed a conspiracy against him by the labs handling the tests.[70][71] A period of legal maneuvering between Di Luca and the Italian National Olympic Committee (CONI) followed. CONI officials asked their anti-doping tribunal (TNA) to suspend Di Luca for three years   while two years is a customary ban for a doping positive,[72] CONI prosecutors sought a third year for recidivism, stemming from Di Luca's previous doping incident two years earlier. He was given a two-year suspension, retroactive to July 2009, and indicated that he would appeal it to the Court of Arbitration for Sport.[73] In October 2010, Di Luca was reinstated to active status by CONI, due to his cooperation with several ongoing doping investigations, though his results were indeed stricken from the record.[74] On 10 January 2011, he signed with Team Katusha and indicated that he would return to the Giro in 2011 to support Katusha team leader Joaquim Rodr guez.[75]

Five days before the start of the 2010 Giro d'Italia, 2009 podium finisher Pellizotti was identified as a rider of interest to the UCI's biological passport program due to irregular blood values. He was removed from his team's start list for the Giro and provisionally suspended.[76] The UCI asked that CONI open disciplinary proceedings against him,[77] which had no resolution until after the 2010 season finished. TNA cleared him on 21 October and declared him free to race, at which time the Liquigas team intended to re-sign him.[78] The UCI decided in January 2011 to appeal his case to the CAS.[79] The hearing was held in March, and Pellizotti asked for a quick resolution, with plans to return with Movistar Team in the 2011 Tirreno   Adriatico if he were cleared. The court reached its decision after five days, upholding the UCI's appeal, handing Pellizotti a two-year ban, and stripping all his results from this Giro and the 2009 Tour de France.[80] Consequently, Pellizotti has said he is quitting the sport.[81]

[edit] Classification leadership

In the 2009 Giro d'Italia, four different jerseys were awarded. For the general classification, calculated by adding each cyclist's finishing times on each stage, and allowing time bonuses for the first three finishers on mass-start stages, the leader received a pink jersey. This classification is considered the most important of the Giro d'Italia, and the winner is considered the winner of the Giro.[32]

Additionally, there was a points classification, which awarded a mauve jersey. In the points classification, cyclists got points for finishing in the top 15 in a stage. The stage win awarded 25   points, second place awarded 20   points, third 16, fourth 14, fifth 12, sixth 10, and one point fewer per place down the

line, to a single point for 15th. In addition, points could be won in intermediate sprints.[32]

There was also a mountains classification, which awarded a green jersey. In the mountains classifications, points were won by reaching the top of a mountain before other cyclists. Each climb was categorized as either first, second, or third category, with more points available for the higher-categorized climbs. The highest point in the Giro (called the Cima Coppi), which in 2009 was SestriÃre in stage 10,[82] afforded more points than the other first-category climbs.[32]

The fourth jersey represented the young rider classification, which awarded a white jersey. This was decided the same way as the general classification, but only riders born after 1 January 1984 were eligible.[32]

There were also two classifications for teams. The first was the Trofeo Fast Team. In this classification, the times of the best three cyclists per team on each stage were added; the leading team was the team with the lowest total time. The Trofeo Super Team was a team points classification, with the top 20Ã placed riders on each stage earning points (20 for first place, 19 for second place and so on, down to a single point for 20th) for their team.[32]

The rows in the following table correspond to the jerseys awarded after that stage was run.

[edit] Final standings

[edit] Trofeo Fast Team classification

Team

Time

1

Astana

257h 48' 40"

2

Team Columbia-High Road

+ 24' 15"

3

Diquigiovanni-Androni

+ 27' 17"

4

Liquigas

+ 32' 21"

5

Lampre-NGC

+ 58' 58"

6

Caisse d'Epargne

+ 1h 10' 52"

7

CervÃlo TestTeam

+ 1h 16' 23"

8

Acqua & Sapone-CaffÃ Mokambo

+ 1h 18' 52"

9

Rabobank

+ 1h 51' 45"

10

LPR Brakes-Farnese Vini

+ 1h 53' 34"

[edit] Trofeo Super Team classification

Team

Points

1

Team Columbia-High Road

400

2
 LPR Brakes-Farnese Vini
 314
 3
 Liquigas
 302
 4
 Diquigiovanni-Androni
 273
 5
 Astana
 269
 6
 Lampre-NGC
 262
 7
 CervÃ©lo TestTeam
 228
 8
 Acqua & Sapone-CaffÃ© Mokambo
 228
 9
 Quick Step
 220
 10
 Rabobank
 199

[edit] Minor classifications

Other less well-known classifications, whose leaders did not receive a special jersey, were awarded during the Giro. These awards were based on points earned throughout the three weeks of the tour.[32][66] Each mass-start stage had one intermediate sprint, the Trapiasso Volante, or T.V. The T.V. gave bonus seconds towards the general classification, points towards the regular points classification, and also points towards the T.V. classification. This award was known in previous years as the "Intergiro" and the "Expo Milano 2015" classification.[32] It was won by Italian Giovanni Visconti, of ISD.[66]

Other awards included the Combativity classification, which was a compilation of points gained for position on crossing intermediate sprints, mountain passes and stage finishes. Mountains classification winner Stefano Garzelli won this award.[32][66] The Azzurri d'Italia classification was based on finishing order, but points were only awarded for the top three finishers in each stage. It was won, like the closely associated points classification, by Danilo Di Luca.[32][66] Additionally, the Trofeo Fuga Cervelo rewarded riders who took part in a breakaway at the head of the field, each rider in an escape of ten or fewer riders getting one point for each kilometre that the group stayed clear. Quick Step's Mauro Facci was first in this competition.[32][66] Teams were given penalty points for minor technical infringements. Silence-Lotto and Quick Step were most successful in avoiding penalties, and so shared leadership of the Fair Play classification.[32][66]

[edit] World Rankings points

The Giro was one of 24 events throughout the season that contributed points towards the 2009 UCI World Ranking. Points were awarded to the top 20 finishers overall, and to the top five finishers in each stage.[90]

Â Petacchi, AlessandroAlessandro PetacchiÂ (ITA)

LPR Brakes-Farnese Vini

45Â

Â Valjavec, TadejTadej ValjavecÂ (SLO)

Ag2r-La Mondiale

44

Â Bruseghin, MarzioMarzio BruseghinÂ (ITA)

Lampre-NGC
39
Â Hagen, Edvald BoassonEdvald Boasson HagenÂ (NOR)
Team Columbia-High Road
36
Â Arroyo, DavidDavid ArroyoÂ (ESP)
Caisse d'Epargne
33
Â Scarponi, MicheleMichele ScarponiÂ (ITA)
Diquigiovanni-Androni
32
Â Siutsou, KanstantsinKanstantsin SiutsouÂ (BLR)
Team Columbia-High Road
26
Â Armstrong, LanceLance ArmstrongÂ (USA)
Astana
26
Â Davis, AllanAllan DavisÂ (AUS)
Quick Step
22
Â Farrar, TylerTyler FarrarÂ (USA)
Garmin-Slipstream
22
Â Serpa, JoseJosÃ© SerpaÂ (COL)
Diquigiovanni-Androni
22
Â Seeldraeyers, KevinKevin SeeldraeyersÂ (BEL)
Quick Step
18
Â Gilbert, PhilippePhilippe GilbertÂ (BEL)
Silence-Lotto
16
Â Gerrans, SimonSimon GerransÂ (AUS)
CervÃ©lo TestTeam
16
Â Bertagnolli, LeonardoLeonardo BertagnolliÂ (ITA)
Diquigiovanni-Androni
16
Â Konovalovas, IgnatasIgnatas KonovalovasÂ (LTU)
CervÃ©lo TestTeam
16
Â Popovych, YaroslavYaroslav PopovychÂ (UKR)
Astana
16
Â Hunter, RobertRobert HunterÂ (RSA)
Barloworld
10
Â Voeckler, ThomasThomas VoecklerÂ (FRA)
Bbox Bouygues Telecom
8
Â Wiggins, BradleyBradley WigginsÂ (GBR)
Garmin-Slipstream
8
Â Gavazzi, FrancescoFrancesco GavazziÂ (ITA)
Lampre-NGC
8
Â Bertogliati, RubensRubens BertogliatiÂ (SUI)
Diquigiovanni-Androni
8
Â Brajkovic, JanezJanez BrajkoviÄ Â (SLO)

Astana
 8
 Â Cardenas, FelixFÃ©lix CÃ¡rdenasÂ (COL)
 Barloworld
 8
 Â Masciarelli, FrancescoFrancesco MasciarelliÂ (ITA)
 Acqua & Sapone-CaffÃ© Mokambo
 8
 Â Pauwels, SergeSerge PauwelsÂ (BEL)
 CervÃ©lo TestTeam
 8
 Â Bak, LarsLars BakÂ (DEN)
 Team Saxo Bank
 6
 Â Cunego, DamianoDamiano CunegoÂ (ITA)
 Lampre-NGC
 5
 Â Lovkvist, ThomasThomas LÃ¶fkvistÂ (SWE)
 Team Columbia-High Road
 4
 Â Swift, BenBen SwiftÂ (GBR)
 Team Katusha
 4
 Â Pinotti, MarcoMarco PinottiÂ (ITA)
 Team Columbia-High Road
 4
 Â Brutt, PavelPavel BruttÂ (RUS)
 Team Katusha
 4
 Â Pate, DannyDanny PateÂ (USA)
 Garmin-Slipstream
 4
 Â Goss, MatthewMatthew GossÂ (AUS)
 Team Saxo Bank
 3
 Â Pozzato, FilippoFilippo PozzatoÂ (ITA)
 Team Katusha
 2
 Â Cataldo, DarioDario CataldoÂ (ITA)
 Quick Step
 2
 Â Hinault, SebastienSÃ©bastien HinaultÂ (FRA)
 Ag2r-La Mondiale
 2
 Â Petrov, EvgeniEvgeni PetrovÂ (RUS)
 Team Katusha
 2
 Â Soler, MauricioMauricio SolerÂ (COL)
 Barloworld
 2
 Â Vigano, DavideDavide ViganÃ²Â (ITA)
 Fuji-Servetto
 2
 Â Bertolini, AlessandroAlessandro BertoliniÂ (ITA)
 Diquigiovanni-Androni
 1
 Â Deignan, PhilipPhilip DeignanÂ (IRE)
 CervÃ©lo TestTeam
 1
 Â Grabovskyy, DmytroDmytro GrabovskyyÂ (UKR)

ISD

1

Â Marzano, MarcoMarco MarzanoÂ (ITA)

Lampre-NGC

1

Â Simoni, GilbertoGilberto SimoniÂ (ITA)

Diquigiovanni-Androni

1

Top ten of the individual standings after the Giro d'Italia[92]

Rank

Prev.

Name

Team

Points

1

999 !â ~

Â Menchov, DenisDenis MenchovÂ (RUS)

Rabobank

218

2

005 !5

Â Davis, AllanAllan DavisÂ (AUS)

Quick Step

205

3

001 !1

Â Haussler, HeinrichHeinrich HausslerÂ (GER)

CervÃ©lo TestTeam

197

4

002 !2

Â Rebellin, DavideDavide RebellinÂ (ITA)

Diquigiovanni-Androni

194

5

003 !3

Â Valverde, AlejandroAlejandro ValverdeÂ (ESP)

Caisse d'Epargne

188

6

004 !4

Â Contador, AlbertoAlberto ContadorÂ (ESP)

Astana

188

7

127 !127

Â Di Luca, DaniloDanilo Di LucaÂ (ITA)

LPR Brakes-Farnese Vini

188

8

006 !6

Â Gilbert, PhilippePhilippe GilbertÂ (BEL)

Silence-Lotto

187

9

027 !27

Â Garzelli, StefanoStefano GarzelliÂ (ITA)

Acqua & Sapone-CaffÃ© Mokambo

170

10

007 !7

Â Sanchez, Luis LeonLuis LeÃ³n SÃ¡nchezÂ (ESP)

Caisse d'Epargne

169

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^ This position was originally occupied by Slovenian cyclist Tadej Valjavec, who has, like Di Luca and Pellizotti, been stripped of his results for a period including this race. See: [1]

^ For this result, Danilo Di Luca was removed and no one was promoted in his stead

^ Di Luca originally won the points competition. While Menchov was promoted to winner, no other rider was added to the top ten
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[edit] External links

Kate Bush

Kate Bush about to perform at Comic Relief 1986

Background information

Birth name

Catherine Bush

Born

(1958-07-30) 30 July 1958 (ageÂ 54)Welling, Southeast London, England

Genres

Art rock,[1]progressive rock,[2]alternative rock,[1]baroque pop

Occupations

Musician, vocalist, songwriter, record producer

Instruments

Vocals, piano, keyboards, bass guitar, guitar, violin

Years active

1975â ^present

Labels

EMI Records (1975â ^present)Columbia Records (U.S.) (1989â ^2009)Legacy Recordings (2010â ^present)

Website

Official website

Notable instruments

Fairlight CMI

Catherine "Kate" Bush, CBE (born 30 July 1958)[1] is an English singer-songwriter, musician and record producer. Her eclectic musical style and idiosyncratic vocal style have made her one of the United Kingdom's most successful solo female performers of the past thirty years.

In 1978, at the age of 19, Bush topped the UK Singles Chart for four weeks with her debut single "Wuthering Heights", becoming the first woman to have a UK number one with a self-written song.[3] She has since released ten albums, three of which topped the UK Albums Chart, and has had 25 UK Top 40 hit singles including the Top 10 hits "Wuthering Heights", "Running Up that Hill", "King of the Mountain", "Babooshka", "The Man with the Child in His Eyes", and "Don't Give Up".

In 1987, she won a Brit Award for Best British Female Solo Artist, and in 2002, her songwriting ability was recognised with an Ivor Novello Award for Outstanding Contribution to British Music. During the course of her career, she has also been nominated for three Grammy Awards. After her 1979 tour â ^ the only concert tour of her career â ^ Bush released the 1980 album *Never for Ever*, which made her the first British solo female artist to top the UK album charts and the first female artist ever to enter the album chart at Number 1.[4] She is also the first (and to date only) female artist to have Top 5 albums in the UK charts in 5 successive decades.

Bush was appointed Commander of the Most Excellent Order of the British Empire (CBE) in the 2013 New Year Honours for services to music.[5][6]

[edit] Early life

Bush was born in Welling, South East London, to English physician Robert Bush

and his Irish wife, Hannah Daly.[7] She was raised as a Roman Catholic [8] in their farmhouse in East Wickham with her older brothers, John and Paddy.[9] Bush came from an artistic background: her mother was a former Irish folk dancer, her father was an accomplished pianist, Paddy worked as a musical instrument maker and John was a poet and photographer. Both brothers were involved in the local folk music scene.[10]

John was a karateka at Goldsmiths College karate club and Kate also trained there, becoming known as "Ee-ee" because of her squeaky kiai. One of the instructors, Dave Hazard, later noted in his autobiography that her dance moves seemed to owe something to karate.[11]

Her family's musical influence inspired the young Kate to teach herself to play the piano at the age of 11. She also played the organ in a barn behind her parents' house and studied the violin.[12] She soon began writing her own tunes and eventually added lyrics to them.[13]

[edit] Career

Bush attended St Joseph's Convent Grammar School (later the St Joseph's campus of Bexley College) and a Catholic girls' school on Woolwich Road in Abbey Wood, London, in the mid-1970s. During this time her family produced a demo tape with over 50 of her compositions, which was turned down by record labels. David Gilmour of Pink Floyd received the demo from Ricky Hopper, a mutual friend of Gilmour and the Bush family. Impressed with what he heard, Gilmour helped the sixteen-year-old Bush get a more professional-sounding demo tape recorded that would be more saleable to the record companies.[14] Three tracks in total were recorded and paid for by Gilmour.[15] The tape was produced by Gilmour's friend Andrew Powell, who would go on to produce Bush's first two albums,[13] and sound engineer Geoff Emerick.[16] The tape was sent to EMI executive Terry Slater.[17] Slater was impressed by the tape and signed her.[18] The British record industry was reaching a point of stagnation.[17] Progressive rock was very popular and visually oriented rock performers were growing in popularity, thus record labels looking for the next big thing were considering experimental acts.[17]

Bush was put on retainer for two years by Bob Mercer, managing director of EMI group-repertoire division. According to Mercer he felt Bush's material was good enough to be released but felt that if the album failed it would be demoralising and if it was successful Bush was too young to handle it.[19] For the first two years of her contract, Bush spent more time on school work than making an album. She left school after doing her mock A-levels and having gained ten GCE O-Level qualifications.[20] In 2005, Bush stated in an interview with Mark Radcliffe on BBC Radio 2 that she believed EMI signed her before she was ready to make an album so that no other record company could offer her a contract. After the contract signing, EMI forwarded her a sizeable advance which she used to enrol in interpretive dance classes taught by Lindsay Kemp, a former teacher of David Bowie,[21] and mime training with Adam Darius.[22]

Bush also wrote and made demos of close to 200 songs, a few of which today can be found on bootleg recordings and are known as the Phoenix Recordings.[23] From March to August 1977, she fronted the KT Bush Band at public houses around London â ^ specifically at the Rose of Lee public house (now Dirty South) in Lewisham. The other three band members were Del Palmer (bass), Brian Bath (guitar), and Vic King (drums). She began recording her first album in August 1977,[13] although two tracks had been recorded during the summer of 1975.

[edit] The Kick Inside and Lionheart

As part of her preparation for entering the studio, Bush toured pubs with the KT Bush Band. However, for her debut album *The Kick Inside* (1978) she was persuaded to use established session musicians, some of whom she would retain even after she had brought her bandmates back on board.[24] Her brother Paddy played the harmonica and mandolin, unlike on later albums where he would play more exotic instruments such as the balalaika and didgeridoo. Stuart Elliott played some of the drums and would become her main percussionist on subsequent albums.[25]

Bush released *The Kick Inside* when she was 19 years old, but some of the songs

had been written when she was as young as 13. EMI originally wanted the more rock-oriented track "James and the Cold Gun" to be her debut single, but Bush insisted that it should be "Wuthering Heights". Even at this early stage of her career, she had gained a reputation for her determination to have a say in decisions affecting her work.[13] "Wuthering Heights" topped the UK and Australian charts and became an international hit.[26] Bush became the first woman to reach number one in the UK charts with a self-penned song.[27] A second single, "The Man with the Child in His Eyes", reached number six in the UK charts.[28] It also made it onto the American Billboard Hot 100 where it reached number 85 in early 1979. Bob Mercer felt that Bush's relative lack of success in the United States compared to the rest of the world was due to her music being a poor fit for American radio formats and that there were no outlets for the visual presentation central to Bush's appeal.[19] "The Man with the Child in His Eyes" went on to win her an Ivor Novello Award in 1979 for Outstanding British Lyric.[29]

EMI capitalised on Bush's appearance by promoting the album with a poster of her in a tight pink top that emphasised her breasts. In an interview with NME magazine in 1982, Bush criticised the marketing technique, stating: "People weren't even generally aware that I wrote my own songs or played the piano. The media just promoted me as a female body. It's like I've had to prove that I'm an artist in a female body." [13] In late 1978, EMI persuaded Bush to quickly record a follow-up album, *Lionheart*, to take advantage of the success of *The Kick Inside*. Bush has often expressed dissatisfaction with *Lionheart*, feeling that she had needed more time to get it right. The album was produced by Andrew Powell, assisted by Bush. While it had spawned several hit singles, most notably "Wow", it did not garner the same reception as her first album, reaching number six in the UK album charts.[30]

Bush was displeased with being rushed into making the second album. She set up her own publishing company, Kate Bush Music, and her own management company, Novercia, to maintain complete control over her work. Members of her family, along with Bush herself, composed the company's board of directors.[13] Following the album's release, she was required by EMI to undertake heavy promotional work and an exhausting tour, the only one of her career.[31] The tour, named *The Tour of Life*, began in April 1979 and lasted six weeks. This live show was co-devised and performed on stage with magician Simon Drake.[32] Typical of her determination to have control, she was involved in every aspect of the show's production, choreography, set design, and staff recruitment.[13] The shows were noted for her dancing, complex lighting and her 17 costume changes per show. Because of her intention to dance as she sang, her sound engineers used a wire coat hanger and a radio microphone to fashion the first headset mic to be used by a rock performer since the Swedish group Spotnicks used a very primitive version in the early 1960s.[1][33]

[edit] *Never for Ever* and *The Dreaming*

Released in September 1980, *Never for Ever* saw Bush's second foray into production, co-producing with Jon Kelly. Her first time as a producer was on her *Live On Stage* EP, released after her tour the previous year. The first two albums had resulted in a definitive sound evident in every track, with orchestral arrangements supporting the live band sound. The range of styles on *Never for Ever* is much more diverse, veering from the straightforward rocker "Violin" to the wistful waltz of hit single "Army Dreamers".

Never for Ever was the first Kate Bush album to feature synthesisers and drum machines, in particular the Fairlight CMI, to which she was introduced when providing backing vocals on Peter Gabriel's eponymous third album in early 1980.[13] It was her first record to reach the top position in the UK album charts, also making her the first female British artist to achieve that status,[20] and the first female artist ever to enter the album chart at the top.[4] The top-selling single from the album was "Babooshka", which reached number five in the UK singles chart.[34] In November 1980, she released the standalone Christmas single "December Will Be Magic Again", which reached number 29 in the UK charts.

September 1982 saw the release of *The Dreaming*, the first album Bush produced by herself.[35] It was also a major departure for Bush, being initially composed on the Fairlight CMI rather than piano, with songs extensively revised and rebuilt in the studio, rather than merely arranged there.[citation needed] With her new-found freedom, she experimented with production techniques, creating an album that features a diverse blend of musical styles and is known for its near-exhaustive use of the Fairlight CMI. *The Dreaming* received a mixed critical reception in the UK, and many were baffled by the dense soundscapes Bush had created to become "less accessible", [36] with some critics suggesting that the album was over-produced.[citation needed] In a 1993 interview with Q, Bush stated: "That was my 'She's gone mad' album." [13] However, the album became her first to enter the US Billboard 200 chart, albeit only reaching number 157.[13] The album entered the UK album chart at number three, but is to date her lowest-selling album, garnering only a silver disc.

"Sat in Your Lap" was the first single from the album to be released. It pre-dated the album by over a year and peaked at number 11 in the UK.[37] The album's title track, featuring the talents of Rolf Harris and Percy Edwards, stalled at number 48, while the third single, "There Goes a Tenner", failed to chart, despite promotion from EMI and Bush. The track "Suspended in Gaffa" was released as a single in Europe, but not in the UK.

Continuing in her storytelling tradition, Bush looked far outside her own personal experience for sources of inspiration. She drew on old crime films for "There Goes a Tenner", a documentary about the war in Vietnam for "Pull Out the Pin", and the plight of Indigenous Australians for "The Dreaming". "Houdini" is about the magician's death, and "Get Out Of My House" was inspired by Stephen King's novel *The Shining*. [38]

[edit] *Hounds of Love* and *The Whole Story*

Hounds of Love was released in 1985. Because of the high cost of hiring studio space for her previous album, she built a private studio near her home, where she could work at her own pace.[39] *Hounds of Love* ultimately topped the charts in the UK, knocking Madonna's *Like a Virgin* from the number one position.[40]

The album takes advantage of the vinyl and cassette formats with two very different sides. The first side, *Hounds of Love*, contains five "accessible" pop songs, including the four singles "Running Up that Hill", "Cloudbusting", "Hounds of Love", and "The Big Sky". "Running Up that Hill" reached number 3 in the UK charts and also re-introduced Bush to American listeners, climbing to number 30 on the Billboard Hot 100 in November 1985. The second side of the album, *The Ninth Wave*, takes its name from Tennyson's poem, "Idylls of the King", about the legendary King Arthur's reign, and is seven interconnecting songs joined in one continuous piece of music.[41]

The album earned Bush nominations for Best Female Solo Artist, Best Album, Best Single, and Best Producer at the 1986 BRIT Awards. In the same year, Bush and Peter Gabriel had a UK top ten hit with "Don't Give Up" (Dolly Parton, Gabriel's original choice, turned his offer down), [42] and EMI released her "greatest hits" album, *The Whole Story*. Bush provided a new lead vocal and refreshed backing track on "Wuthering Heights," and recorded a new single, "Experiment IV," for inclusion on the compilation. At the 1987 BRIT Awards, Bush won the award for Best Female Solo Artist.

[edit] *The Sensual World* and *The Red Shoes*

The increasingly personal tone of her writing continued on 1989's *The Sensual World*, with songs about unexpressed and unrequited love ("Love and Anger" and "Never Be Mine", respectively), and the pressures on modern relationships ("Between a Man and a Woman"). [citation needed] One of the quirkiest tracks on the album, touched by Bush's black humour, is "Heads We're Dancing", about a woman who dances all night with a charming stranger only to discover in the morning that he is Adolf Hitler.[43] The title track drew its inspiration from James Joyce's novel *Ulysses*. [43]

The Sensual World went on to become her biggest-selling album in the US, receiving an RIAA Gold certification four years after its release for 500,000 copies sold. In the United Kingdom album charts, it reached the number two

position.[44]

In 1990, the boxed-set *This Woman's Work* was released and included all of her albums with their original cover art, as well as two discs of all single B sides recorded from 1978 to 1990. In 1991, Bush released a cover of Elton John's "Rocket Man", which reached number 12 in the UK singles chart,[45] and went as high as number two in Australia, and in 2007, was voted the greatest cover ever by readers of *The Observer* newspaper.[46] She recorded "Candle in the Wind", as the single's b-side.[47]

Bush's seventh studio album, *The Red Shoes*, was released in November 1993. The album features more high-profile cameo appearances than her previous efforts, including contributions from composer and conductor Michael Kamen, comedy actor Lenny Henry, Prince, Eric Clapton, Gary Brooker of Procol Harum, Trevor Whittaker, and Jeff Beck. Both *The Sensual World* and *The Red Shoes* featured contributions from Trio Bulgarka, the Bulgarian female vocal trio who sang on several tracks including "You're The One" and "Rocket's Tail". The album gave Bush her highest chart position in the US, reaching number 28, although the only song from the album to make the US singles chart was "Rubberband Girl", which peaked at number 88 in January 1994. In the UK, the album reached number two, and the singles "Rubberband Girl", "The Red Shoes", "Moments of Pleasure", and "And So Is Love" all reached the top 30.[37][48] In 1994, Bush released an accompanying short film, *The Line, the Cross & the Curve*. Written, directed by, and starring Bush, along with English actress Miranda Richardson,[49] the film was based around the concept of *The Red Shoes* and featured six of the songs from the album.

The initial plan had been to take the songs out on the road, but no new tour transpired. Thus, Bush deliberately aimed for a live-band feel, with less of the studio trickery that had typified her last three albums and which would have been too difficult to re-create on stage.[50] The result alienated some of her fan base, who had enjoyed the intricacy of her earlier compositions,[51] but others found a new complexity in the lyrics and the emotions they expressed.[52]

This period had been a troubled time for Bush. She had suffered a series of bereavements, including the loss of guitarist Alan Murphy, who had started working with her on *The Tour Of Life* in 1979, and her mother Hannah, to whom she was exceptionally close.[20] Many of the people she lost are honoured in the ballad "Moments of Pleasure." However, Bush's mother was still alive when "Moments of Pleasure" was written and recorded. Bush describes playing the song to her mother, who thought the line where she is quoted by Bush as saying, "Every old sock meets an old shoe," was hilarious and "couldn't stop laughing." [53]

[edit] *Aerial*

After the release of *The Red Shoes*, Bush dropped out of the public eye for many years, although her name occasionally cropped up in the media with rumours of a new album release. Bush had originally intended to take one year off but despite working on material twelve years passed before her next album release.[54] The press often viewed her as an eccentric recluse, sometimes drawing a comparison with Miss Havisham from Charles Dickens's *Great Expectations*. [55] In reality, she was trying to give her young son a normal childhood, and needed a quiet place for her creative process to function.[54] In 1998, Bush had given birth to Albert, known as "Bertie", fathered by her guitarist and now-husband Danny McIntosh.[20][56] After living for many years on Court Road, Eltham, southeast London, the couple and their son moved away from the city and currently have two homes: a £2.5 million house in East Portlemouth on the Devon coast[56] and a mansion on an islet on the Kennet and Avon Canal at Sulhamstead in West Berkshire.[57]

Bush's eighth studio album, *Aerial*, was released on double CD and vinyl in November 2005.[20] The first single from the album was "King of the Mountain", which was played for the first time on BBC Radio 2 on 21 September 2005.[58]

As on *Hounds of Love* (1985), the album is divided into two sections, each with its own theme and mood.[59] The first disc, subtitled *A Sea of Honey*, features

a set of unrelated themed songs, including "King of the Mountain"; "Bertie", a Renaissance-style ode to her son; and "Joanni", based on the story of Joan of Arc. In the song "İ ", Bush sings the number Pi to 115 decimal places.[59][60] The second disc, subtitled A Sky of Honey, features one continuous piece of music describing the experience of being outdoors after waking at dawn, moving through afternoon, dusk, to night, then back to the following dawn of single summer's day. All the pieces in this suite refer or allude to sky and sea in their lyrical content. Bush mixed her voice with cooing woodpigeons to repeat the phrases "A sea of honey, a sky of honey," and "You're full of beauty" throughout the piece, and uses recordings of actual birdsong throughout. A Sky of Honey features Rolf Harris playing the didgeridoo on one track, and providing vocals on "The Painter's Link".[59] Other artists making guest appearances on the album include Peter Erskine, Eberhard Weber, Lol Creme, and Gary Brooker. Two tracks feature string arrangements by Michael Kamen, performed by the London Metropolitan Orchestra. A CD release of the single "King of the Mountain" included a cover of "Sexual Healing" by Marvin Gaye.[61]

"King of the Mountain" entered the UK Downloads Chart at number six on 17 October 2005,[62] and by 30 October it had become Bush's third-highest-charting single ever in the UK, peaking at number four on the full chart. Aerial entered the UK albums chart at number 3,[63] and the US chart at number 48.[64] Bush herself carried out relatively little publicity for the album, only conducting a handful of magazine and radio interviews. Aerial earned Bush two nominations at the 2006 BRIT Awards, for Best British Female Solo Artist and Best British Album.[65]

In late 2007, Bush composed and recorded a new song, "Lyra", for the soundtrack to the fantasy film The Golden Compass.[66]

[edit] Director's Cut and 50 Words for Snow

On 16 May 2011, Bush released the album Director's Cut. The album, which Bush has described as an entirely new project rather than a collection of mere remixes, contains 11 tracks of substantially reworked material from her earlier albums The Sensual World and The Red Shoes, all of which have been recorded using analogue, rather than digital, equipment to create "a warmer sound". All the tracks have new lead vocals, new drums, and radically reworked instrumentation. Some of them have been transposed to a lower key to accommodate her lowering voice. Three of the songs, including "This Woman's Work", have been completely re-recorded, with lyrics often changed in places.[67] The album has been met with a wide range of reviews with most reviewers a bit confused about the concept of the album itself, while responding with varying degrees of enthusiasm about its revamped tracks. Of particular note is the warmer, more intimate tone of the songs and the richer, more mature sound of her voice.[68][69] This is the first album on her new label, Fish People, a division of EMI Records, with whom she's had a relationship since she started recording. In addition to the album Director's Cut in both its single CD form and in a box-set with The Sensual World and the analogue re-mastered The Red Shoes, Fish People will be releasing re-mastered editions of The Hounds of Love and The Dreaming.[70] The album debuted at number 2 on the United Kingdom chart.[71]

The song "The Sensual World" has been renamed "Flower of the Mountain" and contains a passage of Molly Bloom's famous soliloquy from James Joyce's novel Ulysses. Bush said, "Originally when I wrote the song "The Sensual World", I had used text from the end of Ulysses. When I asked for permission to use the text I was refused, which was disappointing. I then wrote my own lyrics for the song, although I felt that the original idea had been more interesting. Well, I'm not James Joyce am I? When I came to work on this project I thought I would ask for permission again and this time they said yes."[72]

The first single released from the album was "Deeper Understanding" and contains a new chorus featuring computerised vocals from Bush's son, Albert. A video for the song, directed by Bush, has been released through her channel on YouTube. It features Robbie Coltrane as a man consumed by his relationship with his computer (voiced by Bush's son). Frances Barber plays the man's wife, and

Noel Fielding also appears.

Bush's next studio album, *50 Words for Snow*, was released on 21 November 2011. The album contains seven new songs "set against a backdrop of falling snow," with a total running time of 65 minutes.[73][74] A radio edit of the first single, "Wild Man," was played on BBC Radio 2's 'Ken Bruce' show on 10 October.[75] and was released as a digital download on 11 October.[76] The album is distributed in the United States by Anti-Records.

On 14 November 2011, NPR played *50 Words for Snow* in its entirety for the first time.[77] Australia's ABC Radio National declared *50 Words for Snow* album of the week of 12 November 2011.[78]

The album's songs are built around Bush's quietly jazzy piano and Steve Gadd's drums, and utilise both sung and spoken word vocals in what Classic Rock's Stephen Dalton calls "a...supple and experimental affair, with a contemporary chamber pop sound grounded in crisp piano, minimal percussion and light-touch electronics...billowing jazz-rock soundscapes, interwoven with fragmentary narratives delivered in a range of voices from shrill to Laurie Anderson-style cooing." [79] Bassist Danny Thompson appears on the album, which also features performances by Elton John and actor Stephen Fry.

On the first track, "Snowflake," in a song written specifically to use his still high choir-boy voice,[80] Bush's son Albert (Bertie) sings the role of a falling snowflake in a song expressing the hope of a noisy world soon being hushed by snowfall. "Snowflake" drifts into "Lake Tahoe", where choral singer Stefan Roberts and Bush sing about a rarely seen ghost: a woman who appears in a Victorian gown to call to her dog, Snowflake. Bush explained to fellow musician Jamie Cullum in an interview on Dutch Radio[81] that she wished to explore using high male voices in contrast to her own, deeper, voice. "Misty" is about a snowman lover who melts away after a night of passion, while "Wild Man" tells the story of a group of climbers in the Himalayas who, upon finding evidence of a nearby Yeti, erase all traces of it to protect it from discovery. Elton John and Bush as eternally divided lovers trade vocals on "Snowed In at Wheeler Street", while Stephen Fry recites the "50 Words for Snow". The quiet "Among Angels" finishes the album.[82]

50 Words for Snow received general acclaim from music critics. At Metacritic, which assigns a normalised rating out of 100 to reviews from mainstream critics, the album received an average score of 88, based on 26 reviews, which indicates "universal acclaim".[83] She was nominated for a Brit Award in the "Best Female Artist" category,[84] and the album won the 2012 Best Album at the South Bank Arts Awards,[85] and was also nominated for Best Album at the Ivor Novello Awards.[86]

Bush turned down an invitation by the organizers of the 2012 Summer Olympics closing ceremony to perform at the event. Instead a recording of a new remix of her 1985 hit "Running Up that Hill" was played at the end of the ceremony.[87] The remix which was released on 12 August 2012 was based on the 1985 12" single remix, has new lead vocals and was transposed down a semitone to fit Bush's current lower vocal range. The remix entered the UK Singles Chart at number 6 the following week.[88]

[edit] Musical style

Bush is a soprano[89] with a range going from B2 (sung in the 2012 version of "Running Up That Hill") to D7 (screamed in "The Big Sky").[90] Her music is eclectic, varying styles even within an album. Her songs span genres as diverse as rock, pop, alternative and art rock.[1] Even in her earliest works where the piano was a primary instrument, she wove together many diverse influences, melding classical music, rock, and a wide range of ethnic and folk sources, and this has continued throughout her career.

In an interview with *Melody Maker* magazine in 1977, she revealed that male artists had more influence on her work than females, stating: "Every female you see at a piano is either Lynsey de Paul, or Carole King. And most male musicâ ~not all of it but the good stuffâ ~really lays it on you. It really puts you against the wall and that's what I like to do. I'd like my music to intrude. Not many females succeed with that." [13]

The experimental nature of her music has led it to be described as a later, more technological, and more accessible manifestation of the British progressive rock movement.[2][17] Southern England was the home to the most influential and successful acts of the progressive rock movement and,[2] like other artists in this genre, Bush rejects the classic American style of making pop music, which was adopted by most UK pop artists. Bush's vocals contain elements of British, Anglo-Irish and most prominently (southern) English accents and, in its utilisation of musical instruments from many periods and cultures, her music has differed from American pop norms.[2] Elements of Bush's lyrics tend to be more unusual and less clichéd than American-style pop lyrics, often employing historical or literary references and avoiding autobiographical lyrics. She considers herself a storyteller who embodies the character singing the song and strenuously rejects efforts by others to insist that her songs are autobiographical.[2][91][92]

Reviewers have used the term "surreal" to describe her music.[93] Many of her songs have a melodramatic emotional and musical surrealism that defies easy categorisation.[94] It has been observed that even the more joyous pieces are often tinged with traces of melancholy, and even the most sorrowful pieces have elements of vitality struggling against all that would oppress them.[95]

Her lyrics have referenced a wide array of subject matter, often relatively obscure, as in G. I. Gurdjieff in the song "Them Heavy People", while "Deeper Understanding", from *The Sensual World*, portrays a person who stays indoors, obsessively talking to a computer and shunning human contact. "Cloudbusting" was inspired by Peter Reich's autobiography, "Book of Dreams", about his relationship with his father, Wilhelm Reich. In a retrospective review of "Cloudbusting", *Allmusic* journalist Amy Hanson praised the song for "the rich earth of imagery that Bush has tilled throughout her entire career, emerging both tender and brutal." Commending the song for having "a thoughtful lyric and a compulsive cello-driven melody", Hanson wrote: "Even more startling, but hardly surprising, is the ease with which Bush was able to capture the moment when a child first realizes that adults are fallible and the parental cocoon is tenuous at best." [96]

Comedy is also a big influence on her and is a significant component of her work. She has cited Woody Allen,[97] Monty Python, *Fawlty Towers*, and *The Young Ones*[98] as particular favourites. Horror movies are another interest of Bush's and have influenced the gothic nature of several of her songs, such as "Hounds of Love", inspired by the 1957 horror movie *Night of the Demon*. [99] Her songs have occasionally combined comedy and horror to form dark humour, such as murder by poisoning in "Coffee Homeground", an alcoholic mother in "Ran Tan Waltz" and the upbeat "The Wedding List", a song inspired by François Truffaut's 1967 film of Cornell Woolrich's *The Bride Wore Black* about the death of a groom and the bride's subsequent revenge against the killer.[100]

In 1983 *New Musical Express* noted that Bush was not afraid to tackle what was described as sensitive and taboo subjects.[101] "The Kick Inside" is based on a traditional English folk song (The Ballad of Lucy Wan) about an incestuous pregnancy and a resulting suicide.[102] "Kashka from Baghdad" is a song about a homosexual male couple; [103] *Out* magazine listed two of her albums in their Top 100 Greatest Gayest albums list.[104] "The Infant Kiss" is a song about a haunted, unstable woman's almost pedophile infatuation with a young boy in her care (inspired by Jack Clayton's film *The Innocents* (1961), which had been based on Henry James's famous novella *The Turn of the Screw*); [105][106] and "Breathing" explores the results of nuclear fallout from the perspective of an unborn child in the womb.[107]

[edit] Length of time between albums and perception of perfectionism

The length of time in between album releases has led to rumours in the media concerning her health or appearance.[98] In the past, stories of weight gain or mental instability have been disproved by Bush's periodic reappearance.[108] In 2011 Bush told BBC Radio 4 that the amount of time between album releases is extremely stressful noting: "It's very frustrating the albums take as long as they do...I wish there weren't such big gaps between them." In the same

interview Bush denied she was a perfectionist in the studio, saying: "I think it's important that things are flawed...That's what makes a piece of art interesting sometimes â ^ the bit that's wrong or the mistake you've made that's led onto an idea you wouldn't have had otherwise," and reiterated her prioritisation of her family life.[91]

[edit] Live performances

Bush's only tour took place 2 April â ^ 13 May 1979, after which she has given only the occasional live performance. Several reasons have been suggested as to why she abandoned touring, among them her reputed need to be in total control of the final product, which is incompatible with live stage performance, a rumour of a crippling fear of flying,[109] and the suggestion that the death of 21-year-old Bill Duffield severely affected her. Duffield, her lighting director, was killed in an accident during her 2 April 1979 concert at Poole Arts Centre. Bush held a benefit concert on 12 May 1979, with Peter Gabriel and Steve Harley at London's Hammersmith Odeon for his family. Duffield would be honoured in two later songs: "Blow Away" on *Never for Ever* and "Moments of Pleasure" on *The Red Shoes*. Bush explained in a BBC Radio 2 interview with Mark Radcliffe that she actually enjoyed the tour but was consumed with producing her subsequent records. A BBC film crew followed the preparation for the tour which was shown on the BBC Nationwide program as a 30 minute special.

During the same period as her tour, she made numerous television appearances around the world, including *Top of the Pops* in the United Kingdom, *Bios Bahnhof* in Germany, and *Saturday Night Live* in the United States (with Paul Shaffer on piano).[110] On 28 December 1979, BBC TV aired the *Kate Bush Christmas Special*. It was recorded in October 1979 at the BBC Studios in Birmingham, England; choreography by Anthony Van Laast.[111] As well as playing songs from her first two albums, she played "December Will Be Magic Again", and "Violin" from her forthcoming album, *Never for Ever*. Peter Gabriel made a guest appearance to play "Here Comes the Flood", and a duet of Roy Harper's "Another Day" with Bush.[112]

After the *Tour of Life* Bush desired to make two more albums before touring again. At that point she got involved with production techniques and sound experimentation that took up a lot of time and prevented her from touring. Later on there were a couple of instances where she came close to touring again.[113]

In 1982, Bush participated in the first benefit concert in aid of The Prince's Trust alongside artists such as Madness, Midge Ure, Phil Collins, Mick Karn and Pete Townshend. On 25 April 1986 Bush performed live for British charity event *Comic Relief*, singing "Do Bears...Â ?", a humorous duet with Rowan Atkinson, and a rendition of "Breathing". Later in the year on 28 June 1986, she made a guest appearance to duet with Peter Gabriel on "Don't Give Up" at Earl's Court, London as part of his "So" tour. In March 1987, Bush sang "Running Up that Hill" at The Secret Policeman's Third Ball accompanied by David Gilmour.

On 17 January 2002, Bush appeared with her long-time champion, David Gilmour, singing the part of the doctor in "Comfortably Numb" at the Royal Festival Hall in London.

In 2011 Bush told the magazine *Classic Rock*: "I do hope that some time I get a chance to do some shows. Maybe not a tour, but something"[113]

[edit] Video projects

In 1979 Bush's one live show, *The Tour of Life*, was recorded for the BBC and for release on VHS as *Kate Bush Live at Hammersmith Odeon*. [114]

Bush has appeared in innovative music videos designed to accompany her singles releases. Among the best known are those for "Running Up that Hill", "Babooshka", "Breathing", "Wuthering Heights", and "The Man with the Child in His Eyes", and "Cloudbusting", featuring actor Donald Sutherland, who made time during the filming of another project to take part in the video.[115] EMI has released collections of her videos, including *The Single File*, *Hair of the Hound*, *The Whole Story*, a career video overview released in conjunction with the 1986 compilation album of the same title,[114] and *The Sensual World*.

In 1993, she directed and starred in the short film, *The Line, the Cross &*

the Curve, a musical co-starring Miranda Richardson, featuring music from Bush's album *The Red Shoes*, which was inspired by the classic movie of the same name. It was released on VHS in the UK in 1994 and also received a small number of cinema screenings around the world. In recent interviews, Bush has said that she considers it a failure, and stated in 2001: "I'm very pleased with four minutes of it, but I'm very disappointed with the rest." [116] In a 2005 interview, she described the film as "A load of bollocks." [117]

In 1994, Bush provided the music used in a series of psychedelic-themed television commercials for the soft drink Fruitopia that appeared in the United States. The same company aired the ads in the United Kingdom, but the British version featured singer Elizabeth Fraser of Cocteau Twins instead of Bush. [118]

In late 2006, a DVD documentary titled *Kate Bush Under Review* was released by Sexy Intellectual, which included archival interviews with Bush, along with interviews with a selection of music historians and journalists (including Phil Sutcliffe, Nigel Williamson, and Morris Pert). The DVD also includes clips from several of Bush's music videos. [119]

On 2 December 2008, the DVD collection of the fourth season of *Saturday Night Live*, including her performances, was released. [120] A three DVD set of *The Secret Policeman's Balls* benefit concerts that includes Bush's performance was released on 27 January 2009. [121]

Bush has released four short videos for the album *50 Words for Snow*. One is an advertisement for the album. Two stop-motion "Animation Segments" were posted on the Kate Bush Official website and YouTube, one to accompany a 2 minute 25 second section of "Misty", called "Mistraldespair", the other to accompany a 2 minute 33 second section of "Wild Man". "Mistraldespair" was directed by Bush and animated by Gary Pureton, [122] while the "Wild Man" segment was created by Finn and Patrick at Brandt Animation. [123] On 24 January 2012, a third piece called "Eider Falls at Lake Tahoe", was premiered on her website and on YouTube. Running at 5:01, the piece is a sepia tone shadow puppet animation. Directed by Bush and photographed by award-winning British cinematographer Roger Pratt, the shadow puppets were designed by Robert Allsopp. [124] Bush stated that "Eider Falls at Lake Tahoe" is intended to be a "self contained piece" separate from the song "Lake Tahoe". [125]

[edit] Film projects

In 1990, Bush starred in the black comedy film *Les Dogs*, produced by The Comic Strip for BBC television. Aired on 8 March 1990, Bush plays the bride Angela at a wedding set in a post-apocalyptic version of Britain. While Bush's is a silent presence in a wedding dress throughout most of the film, she does have several lines of dialogue with Peter Richardson in two dream sequences. In another Comic Strip Presents film, *GLC*, she produced the theme song "Ken", which includes a vocal performance by Bush. The song was written about Ken Livingstone, the leader of the Greater London Council, who would later be elected as mayor of London and at the time was working with musicians to help the Labour Party garner the youth vote. [126]

She also produced all the incidental music, which is synthesiser based. Bush wrote and performed the song "The Magician", in a fairground-like arrangement, for Menahem Golan's 1979 film *The Magician of Lublin*. [127] In 1985, Bush contributed a darkly melancholic version of the Ary Barroso song "Brazil" to the soundtrack of the Terry Gilliam film *Brazil*. The track was scored and arranged by Michael Kamen. In 1986, she wrote and recorded "Be Kind To My Mistakes" for the Nicolas Roeg film *Castaway*. An edited version of this track was used as the B side to her 1989 single "This Woman's Work". In 1988, the song "This Woman's Work" was featured in the John Hughes film *She's Having a Baby*, and a slightly remixed version appeared on Bush's album *The Sensual World*. [128] The song has since appeared on numerous television shows, and in 2005 reached number eight on the UK download chart after featuring in a British television advertisement for the charity NSPCC. [129]

In 1999, Bush wrote and recorded a song for the Disney film *Dinosaur*, but the track was ultimately not included on the soundtrack. According to the winter 1999 issue of *HomeGround*, a Bush fanzine, it was scrapped when Disney asked her

to rewrite the song and she refused. Also in 1999, Bush's song "The Sensual World" was featured prominently in Canadian filmmaker Atom Egoyan's film "Felicia's Journey".[130] "The Man with the Child in His Eyes" is on the soundtrack for the 2007 British romantic comedy film Starter for 10.[131]

In 2007, Bush was asked to write a song for The Golden Compass soundtrack which made reference to the lead character, Lyra Belacqua. The song, "Lyra", was used in the closing credits of the film, reached number 187 in the UK Singles Chart[132] and was nominated for the International Press Academy's Satellite Award for original song in a motion picture.[133][134]

According to Del Palmer, Bush was asked to compose the song on very short notice and the whole project was completed in 10 days.[135] The song was produced and recorded by Bush in her own studio, and features the Magdalen College, Oxford choir.

[edit] Collaborations

Bush provided vocals on two of Peter Gabriel's albums, including the hits "Games Without Frontiers" and "Don't Give Up", as well as "No Self-Control". Gabriel appeared on Bush's 1979 television special, where they sang a duet of Roy Harper's "Another Day". She has sung on two Roy Harper tracks, "You", on his 1979 album, "The Unknown Soldier", and "Once", the title track of his 1990 album. She has also sung on the title song of the 1986 Big Country album The Seer, the Midge Ure song "Sister and Brother" from his 1988 album Answers to Nothing, Go West's 1987 single "The King Is Dead" and two songs with Prince's "Why Should I Love You?", from her 1993 album The Red Shoes, and in 1996, the song "My Computer" from Prince's album Emancipation. In 1987, she sang a verse on the charity single "Let It Be" by Ferry Aid. She sang a line on the charity single "Spirit of the Forest" by Spirit of the Forest in 1989.

1990 saw Kate producing, for the only time in her career, one song for another artist, Alan Stivell's "Kimiad", on his album Again. Stivell had appeared on The Sensual World. In 1994, Bush covered George Gershwin's "The Man I Love" for the tribute album The Glory of Gershwin. In 1996, Bush contributed a version of "Mná na hÉireann" (Irish for "Women of Ireland") for the Anglo-Irish folk-rock compilation project Common Ground: The Voices of Modern Irish Music. Bush had to sing the song in Irish, which she learned to do phonetically.[136]

Artists who have contributed to Bush's own albums include Eric Clapton, Jeff Beck, David Gilmour, Nigel Kennedy, Gary Brooker, and Prince. Bush provided backing vocals for a song that was recorded during the 1990s titled Wouldn't Change a Thing by Lionel Azulay, the drummer with the original band that was later to become the KT Bush Band. The song, which was engineered and produced by Del Palmer, is available for download and will be on Azulay's upcoming CD.[137][138]

Bush declined a request by Erasure to produce one of their albums because "she didn't feel that that was her area".[139]

In 2010, Bush provided vocals for Rolf Harris's cover of the traditional Irish song "She Moves Through the Fair". Harris, who described the collaboration the "best thing I've done," is unsure of how to release the track.[140]

Bush's most recent collaborations, including duets with Elton John and Stephen Fry, took place on her 2011 album, 50 Words for Snow.

[edit] Influence

From the 1980s onward, it has become almost standard for individualistic female singer-songwriters to be compared to Bush by the media. She has been noted as an influence on female artists such as Tori Amos,[141]Alison Goldfrapp of Goldfrapp,[142][143]Nerina Pallot,[144]KT Tunstall,[145]Natasha Khan of Bat for Lashes,[146]Happy Rhodes,[147]Lily Allen,[148]PJ Harvey,[39][149]Little Boots,[150][151][152]Liv Kristine of Leaves' Eyes and Theatre of Tragedy,[153] and Florence Welch of Florence + the Machine,[154][155] in addition to acts as diverse as Muse,[145]OutKast,[149] and Bloc Party.[156]Paula Cole named Bush as an influence while accepting the Best New Artist Grammy in 1996. Ariel Pink wrote a tribute song for her titled "For Kate I Wait" on the album The Doldrums. The trip-hop artist Tricky has said about Bush, "I don't believe in God, but if I did, her music would be my bible".[20]

Punk rocker John Lydon, better known as Johnny Rotten of the Sex Pistols, declared her work to be "beauty beyond belief",^[157] and labelled her "a true original". Rotten once wrote a song for her, titled "Bird in Hand" (about exploitation of parrots) that Bush rejected. Rotten theorised that Bush thought the song contained insulting references aimed at her.^{[158][159]} Marc Almond chose "Moments of Pleasure" as one of his 10 favourite songs on Radio 2 in June 2007, saying that the song had a profound influence on him when he was combating drug addiction in New York in the 1990s. In November 2006, the singer Rufus Wainwright named Bush as one of his top ten gay icons.^[160] Outside music, Bush has been an inspiration to several fashion designers, most notably Hussein Chalayan.^[161]

Many artists around the world have recorded cover versions of Bush songs, including Charlotte Church, The Futureheads (who had a UK top ten hit with a cover of "Hounds of Love"), Placebo (whose cover of "Running Up that Hill" has featured in many TV series and films), Pat Benatar, Faith and the Muse, Hayley Westenra, Jane Birkin, Natalie Cole, Ra Ra Riot,^{[162][163]} Maxwell,^[164] The Church^[165] and Nada Surf.^[166] The British dance act Utah Saints sampled a line from "Cloudbusting" for their single, "Something Good". Artists such as Tori Amos, Nolwenn Leroy, Patrick Wolf and Happy Rhodes (whose upper vocal range has been compared with the one of Kate Bush)^[167] have covered her songs in live performances. Coldplay said their track "Speed of Sound" was originally an attempt to re-create "Running Up that Hill".

Suede front-man Brett Anderson has stated that "Wuthering Heights" was the first single he ever bought and mentioned "And Dream of Sheep" in Suede's song "These are the Sad Songs".^[168] British folk singer Jim Moray also references "And Dream of Sheep" in his self-penned track "Longing for Lucy".^[169] Progressive death metal act Novembre also covered "Cloudbusting" on their album *Novembrine Waltz*. In 2009, John Fort released a hip hop version of "Running Up that Hill".^[170]

In 2010, composer and vocalist Theo Bleckmann released an album of Kate Bush covers, titled *Hello Earth! â The Music of Kate Bush* which includes his interpretation of fourteen Bush classics,^[171] which he also performs live around the world. In an interview with Hungarian online music magazine Kortárs Blog, Bleckmann explained his choice to explore Bush's work: "The music of Kate Bush has been a saviour throughout my teenage years when I lived in a small town in Germany...To come back to her music fresh...and to discover more depths and beauty in it, became an overwhelming confirmation of the endurance of great music regardless of genre and time."^{[172][173]}

[edit] Personal life

Bush is married to guitarist Dan McIntosh and the couple have a son, Albert.^[174] A former resident of Eltham, south east London,^[175] she resides in Devon and until late 2011 had another residence near Theale, West Berkshire.

[edit] Discography

[edit] See also

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 Two Musicians who have worked with Bush describe her working style and non work
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 The Illustrated Collector's Guide to Kate Bush, 2nd Edition, published by
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 Includes albums, CDs, DVDs, books and other collectibles. It's complete up to
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[edit] External links

Media related to Kate Bush at Wikimedia Commons

Persondata

Name

Bush, Kate

Alternative names

Bush, Catherine

Short description

English singer, songwriter, musician and record producer

Date of birth

30 July 1958

Place of birth

Welling, Southeast London, England

Date of death

Place of death

State of Minnesota

Nickname(s): North Star State;

Land of 10,000 Lakes; The Gopher State

Motto(s): L'Ã toile du Nord (French: The Star of the North)

Demonym

Minnesotan

Capital

Saint Paul

Largest city

Minneapolis

Largest metro area

Minneapolisâ ^Saint Paul

AreaÂ

Ranked 12th in the U.S.

Â -Â Total

86,939Â sqÂ mi

(225,181 km2)

Â -Â Width

c. 200Â ^350Â milesÂ (c. 320Â ^560 km)

Â -Â Length

c. 400Â milesÂ (c. 640 km)

Â -Â % water

8.4

Â -Â Latitude

43Â°â 30â ^ N to 49Â°â 23â ^ N

Â -Â Longitude

89Â°â 29â ^ W to 97Â°â 14â ^ W

PopulationÂ

Ranked 21st in the U.S.

Â -Â Total

5,379,139 (2012 est)[1]

Â -Â Density

67.1/sqÂ miÂ (25.9/km2)Ranked 31st in the U.S.

Â -Â Median household incomeÂ

\$55,802 (10th)

Elevation

Â

Â -Â Highest point

Eagle Mountain[2][3]

2,302Â ft (701 m)

Â -Â Mean

1,200Â ftÂ (370 m)

Â -Â Lowest point

Lake Superior[2][3]

601Â ft (183 m)

Before statehood

Minnesota Territory
Admission to Union
May 11, 1858 (32nd)
Governor
Mark Dayton (DFL)
Lieutenant Governor
Yvonne Prettner Solon (DFL)
Legislature
Minnesota Legislature
- Upper house
Senate
- Lower house
House of Representatives
U.S. Senators
Amy Klobuchar (DFL) Al Franken (DFL)
U.S. House delegation
5 Democrats, 3 Republicans (list)
Time zone
Central: UTC-6/-5
Abbreviations
MN Minn. US-MN
Website
www.state.mn.us

Minnesota (/ˈmɪnˈɛˈnə soʊ tɛ/)^[4] is a U.S. state located in the Midwestern United States. Minnesota was carved out of the eastern half of the Minnesota Territory and admitted to the Union as the 32nd state on May 11, 1858. Known as the "Land of 10,000 Lakes", the state's name comes from a Dakota word for "sky-tinted water". Those waters, together with forests, parks, and wilderness areas, offer residents and tourists a variety of outdoor recreational opportunities.

Minnesota is the 12th most extensive and the 21st most populous of the U.S. states. Nearly 60% of its residents live in the Minneapolis–Saint Paul metropolitan area (known as the "Twin Cities"), the center of transportation, business, industry, education, government and home to an internationally known arts community. The remainder of the state consists of western prairies now given over to intensive agriculture; deciduous forests in the southeast, now cleared, farmed and settled; and the less populated North Woods, used for mining, forestry, and recreation.

Minnesota is known for its relatively mixed social and political orientations, and has a high rate of civic participation and voter turnout. Minnesota ranks among the healthiest states, and has a highly literate population. The large majority of residents are of Scandinavian and German descent. The state is known as a center of Scandinavian American culture. Ethnic diversity has increased in recent decades. Substantial influxes of Asian, African, and Latin American immigrants have joined the descendants of European immigrants and the original Native American inhabitants.

[edit] Etymology

The word Minnesota comes from the Dakota name for the Minnesota River: Mnisota. The root mni (also spelled mini or minne) means, "water". Mnisota can be translated as sky-tinted water or somewhat clouded water.^[4]^[5] Native Americans demonstrated the name to early settlers by dropping milk into water and calling it mnisota.^[5] Many locations in the state have similar names, such as Minnehaha Falls ("waterfall"), Minneiska ("white water"), Minneota ("much water"), Minnetonka ("big water"), Minnetrista ("crooked water"), and Minneapolis, which is a combination of mni and polis, the Greek word for "city".^[6]

[edit] Geography

Minnesota is the northernmost U.S. state apart from Alaska; its isolated Northwest Angle in Lake of the Woods is the only part of the 48 contiguous states lying north of the 49th Parallel. The state is part of the U.S. region known as the Upper Midwest and part of the Great Lakes Region of North America.

The state shares a Lake Superior water border with Michigan and a land and water border with Wisconsin to the east. Iowa is to the south, North Dakota and South Dakota to the west, and the Canadian provinces of Ontario and Manitoba to the north. With 86,943 square miles (225,180 km²),[7] or approximately 2.25% of the United States,[8] Minnesota is the twelfth-largest state.[9]

[edit] Geology and terrain

Minnesota contains some of the oldest rocks found on earth, gneisses some 3.6 billion years old, or 80% as old as the planet.[10][11] About 2.7 billion years ago, basaltic lava poured out of cracks in the floor of the primordial ocean; the remains of this volcanic rock formed the Canadian Shield in northeast Minnesota.[10][12] The roots of these volcanic mountains and the action of Precambrian seas formed the Iron Range of northern Minnesota. Following a period of volcanism 1.1 billion years ago, Minnesota's geological activity has been more subdued, with no volcanism or mountain formation, but with repeated incursions of the sea, which left behind multiple strata of sedimentary rock.[10]

In more recent times, massive ice sheets at least one kilometer thick ravaged the landscape of the state and sculpted its current terrain.[10] The Wisconsin glaciation left 12,000 years ago.[10] These glaciers covered all of Minnesota except the far southeast, an area characterized by steep hills and streams that cut into the bedrock. This area is known as the Driftless Zone for its absence of glacial drift.[13] Much of the remainder of the state outside of the northeast has 50 ft (15 m) or more of glacial till left behind as the last glaciers retreated. Gigantic Lake Agassiz formed in the northwest 13,000 years ago. Its bed created the fertile Red River valley, and its outflow, glacial River Warren, carved the valley of the Minnesota River.[10] Minnesota is geologically quiet today; it experiences earthquakes infrequently, and most of them are minor.[14]

The state's high point is Eagle Mountain at 2,301 ft (701 m), which is only 13 miles (21 km) away from the low of 601 ft (183 m) at the shore of Lake Superior.[12][15] Notwithstanding dramatic local differences in elevation, much of the state is a gently rolling peninsular plain.[10]

Two major drainage divides meet in the northeastern part of Minnesota in rural Hibbing, forming a triple watershed. Precipitation can follow the Mississippi River south to the Gulf of Mexico, the Saint Lawrence Seaway east to the Atlantic Ocean, or the Hudson Bay watershed to the Arctic Ocean.[16]

The state's nickname, The Land of 10,000 Lakes, is no exaggeration; there are 11,842 Minnesota lakes over 10 acres (0.040 km²) in size.[17] The Minnesota portion of Lake Superior is the largest at 962,700 acres (3,896 km²) and deepest (at 1,290 ft (390 m)) body of water in the state.[17] Minnesota has 6,564 natural rivers and streams that cumulatively flow for 69,000 miles (111,000 km).[17] The Mississippi River begins its journey from its headwaters at Lake Itasca and crosses the Iowa border 680 miles (1,090 km) downstream.[17] It is joined by the Minnesota River at Fort Snelling, by the St. Croix River near Hastings, by the Chippewa River at Wabasha, and by many smaller streams. The Red River, in the bed of glacial Lake Agassiz, drains the northwest part of the state northward toward Canada's Hudson Bay. Approximately 10.6 million acres (42,900 km²) of wetlands are contained within Minnesota's borders, the most of any state except Alaska.[18]

[edit] Flora and fauna

Minnesota has four ecological provinces: Prairie Parkland in the southwestern and western parts of the state, the Eastern Broadleaf Forest (Big Woods) in the southeast, extending in a narrowing strip to the northwestern part of the state, where it transitions into Tallgrass Aspen Parkland, and the northern Laurentian Mixed Forest, a transitional forest between the northern boreal forest and broadleaf forests to the south.[19] These northern forests are a vast wilderness of pine and spruce trees mixed with patchy stands of birch and poplar.

Much of Minnesota's northern forest underwent logging at some time, leaving only a few patches of old growth forest today in areas such as in the Chippewa

National Forest and the Superior National Forest where the Boundary Waters Canoe Area Wilderness has some 400,000 acres (161,874 ha) of unlogged land.[20] Although logging continues, regrowth keeps about one third of the state forested.[21] Nearly all of Minnesota's prairies and oak savannas have been destroyed or fragmented because of farming, grazing, logging, and suburban development.[22]

While loss of habitat has affected native animals such as the pine marten, elk, woodland caribou, and bison,[23] others like whitetail deer and bobcat thrive. The state has the nation's largest population of timber wolves outside Alaska,[24] and supports healthy populations of black bear and moose. Located on the Mississippi Flyway, Minnesota hosts migratory waterfowl such as geese and ducks, and game birds such as grouse, pheasants, and turkeys. It is home to birds of prey including the largest number of breeding pairs of bald eagles in the lower 48 states as of 2007,[25] red-tailed hawk, and snowy owl. The lakes teem with sport fish such as walleye, bass, muskellunge, and northern pike, and streams in the southeast are populated by brook, brown, and rainbow trout.

[edit] Climate

Minnesota endures temperature extremes characteristic of its continental climate; with cold winters and hot summers. The record high and low span is 174 degrees Fahrenheit (96°C) (from a '60 °F (a '51°C) at Tower on February 2, 1996 to 114 °F (46°C) at Moorhead on July 6, 1936).[26] Meteorological events include rain, snow, blizzards, thunderstorms, hail, derechos, tornadoes, and high-velocity straight-line winds. The growing season varies from 90 days per year in the Iron Range to 160 days in southeast Minnesota near the Mississippi River, and mean average temperatures range from 37 to 49 °F (3 to 9 °C).[27] Average summer dew points range from about 58 °F (14°C) in the south to about 48 °F (9°C) in the north.[27][28] Depending on location, average annual precipitation ranges from 19 to 35 inches (48 to 89 cm), and droughts occur every 10 to 50 years.[27]

[edit] Protected lands

Minnesota's first state park, Itasca State Park, was established in 1891, and is the source of the Mississippi River.[29] Today Minnesota has 72 state parks and recreation areas, 58 state forests covering about four million acres (16,000 km²), and numerous state wildlife preserves, all managed by the Minnesota Department of Natural Resources. There are 5.5 million acres (22,000 km²) in the Chippewa and Superior National Forests. The Superior National Forest in the northeast contains the Boundary Waters Canoe Area Wilderness, which encompasses over a million acres (4,000 km²) and a thousand lakes. To its west is Voyageurs National Park. The Mississippi National River and Recreation Area (MNRRA), is a 72 miles (116 km) long corridor along the Mississippi River through the Minneapolis-St. Paul Metropolitan Area connecting a variety of sites of historic, cultural, and geologic interest.[30]

[edit] History

Before European settlement of North America, Minnesota was populated by the Dakota people. As Europeans settled the east coast, Native American movement away from them caused migration of the Anishinaabe and other Native Americans into the Minnesota area. The first Europeans in the area were French fur traders who arrived in the 17th century. Late that century, Anishinaabe, also known as Ojibwe Indians migrated westward to Minnesota, causing tensions with the Dakota people.[31] Explorers such as Daniel Greysolon, Sieur du Lhut, Father Louis Hennepin, Jonathan Carver, Henry Schoolcraft, and Joseph Nicollet, among others, mapped out the state.

The portion of the state east of the Mississippi River became part of the United States at the end of the American Revolutionary War, when the Second Treaty of Paris was signed. Land west of the Mississippi River was acquired with the Louisiana Purchase, although a portion of the Red River Valley was disputed until the Treaty of 1818.[32] In 1805, Zebulon Pike bargained with Native Americans to acquire land at the confluence of the Minnesota and Mississippi rivers. The construction of Fort Snelling followed between 1819 and 1825.[33] Its soldiers built a grist mill and a sawmill at Saint Anthony Falls,

the first of the water-powered industries around which the city of Minneapolis later grew. Meanwhile, squatters, government officials, and tourists had settled near the fort. In 1839, the Army forced them to move downriver and they settled in the area that became St. Paul.[34] Minnesota Territory was formed on March 3, 1849. Thousands of people had come to build farms and cut timber, and Minnesota became the 32nd U.S. state on May 11, 1858.

Treaties between European settlers and the Dakota and Ojibwe gradually forced the natives off their lands and on to smaller reservations. As conditions deteriorated for the Dakota, tensions rose, leading to the Dakota War of 1862.[35] The result of the six-week war was the execution of 38 Dakota â ~ the largest mass execution in United States history â ~ and the exile of most of the rest of the Dakota to the Crow Creek Reservation in Dakota Territory.[32] As many as 800 white settlers died during the war.[36]

Logging and farming were mainstays of Minnesota's early economy. The sawmills at Saint Anthony Falls, and logging centers like Marine on St. Croix, Stillwater, and Winona, processed high volumes of lumber. These cities were situated on rivers that were ideal for transportation.[32] Later, Saint Anthony Falls was tapped to provide power for flour mills. Innovations by Minneapolis millers led to the production of Minnesota "patent" flour, which commanded almost double the price of "bakers" or "clear" flour, which it replaced.[37] By 1900, Minnesota mills, led by Pillsbury, Northwestern and the Washburn-Crosby Company (a forerunner of General Mills), were grinding 14.1% of the nation's grain.[38]

The state's iron-mining industry was established with the discovery of iron in the Vermilion Range and the Mesabi Range in the 1880s, and in the Cuyuna Range in the early 20th century. The ore was shipped by rail to Duluth and Two Harbors, then loaded onto ships and transported eastward over the Great Lakes.[32]

Industrial development and the rise of manufacturing caused the population to shift gradually from rural areas to cities during the early 20th century. Nevertheless, farming remained prevalent. Minnesota's economy was hard-hit by the Great Depression, resulting in lower prices for farmers, layoffs among iron miners, and labor unrest. Compounding the adversity, western Minnesota and the Dakotas were hit by drought from 1931 to 1935. New Deal programs provided some economic turnaround. The Civilian Conservation Corps and other programs around the state established some jobs for Indians on their reservations, and the Indian Reorganization Act of 1934 provided the tribes with a mechanism of self-government. This provided natives a greater voice within the state, and promoted more respect for tribal customs because religious ceremonies and native languages were no longer suppressed.[33]

After World War II, industrial development quickened. New technology increased farm productivity through automation of feedlots for hogs and cattle, machine milking at dairy farms, and raising chickens in large buildings. Planting became more specialized with hybridization of corn and wheat, and the use of farm machinery such as tractors and combines became the norm. University of Minnesota professor Norman Borlaug contributed to these developments as part of the Green Revolution.[33] Suburban development accelerated due to increased postwar housing demand and convenient transportation. Increased mobility, in turn, enabled more specialized jobs.[33]

Minnesota became a center of technology after World War II. Engineering Research Associates was formed in 1946 to develop computers for the United States Navy. It later merged with Remington Rand, and then became Sperry Rand. William Norris left Sperry in 1957 to form Control Data Corporation (CDC).[39] Cray Research was formed when Seymour Cray left CDC to form his own company. Medical device maker Medtronic also started business in the Twin Cities in 1949.

[edit] Cities and towns

Saint Paul, located in east-central Minnesota along the banks of the Mississippi River, has been Minnesota's capital city since 1849, first as capital of the Territory of Minnesota, and then as state capital since 1858.

Saint Paul is adjacent to Minnesota's most populous city, Minneapolis; they and their suburbs are known collectively as the Twin Cities metropolitan area, the fifteenth largest metropolitan area in the United States and home to about 60% of the state's population.[40][41] The remainder of the state is known as "Greater Minnesota" or "Outstate Minnesota".

The state has seventeen cities with populations above 50,000 (based on 2010 census). In descending order of size they are Minneapolis, Saint Paul, Rochester, Duluth, Bloomington, Brooklyn Park, Plymouth, Saint Cloud, Eagan, Woodbury, Maple Grove, Coon Rapids, Eden Prairie, Minnetonka, Burnsville, Apple Valley, Blaine and Lakeville.[41] Of these only Rochester, Duluth, and Saint Cloud are outside the Twin Cities metropolitan area.

Minnesota's population continues to grow, primarily in the urban centers. The populations of metropolitan Sherburne and Scott Counties doubled between 1980 and 2000, while 40 of the state's 87 counties lost residents over the same decades.[42]

[edit] Demographics

[edit] Population

From fewer than 6,100 people in 1850, Minnesota's population grew to over 1.7 million by 1900. Each of the next six decades saw a 15% increase in population, reaching 3.4 million in 1960. Growth then slowed, rising 11% to 3.8 million in 1970, and an average of 9% over the next three decades to 4.9 million in the 2000 Census.[42] The United States Census Bureau estimates that the population of Minnesota was 5,379,139 on July 1, 2012, a 1.4% increase since the 2010 United States Census.[1] The rate of population change along with age and gender distributions approximate the national average. The center of population of Minnesota is located in Hennepin County, in the city of Rogers.[43]

[edit] Ancestry

The principal ancestries of Minnesota's residents in 2010 were surveyed to be the following:[44]

Ancestries claimed by less than 3% of the population include American, Italian, and Dutch, each between 2 and 3%; Sub-Saharan African and East African, Scottish, French Canadian, Scotch-Irish and Mexican, each between 1 and 1.9%; and less than 1% each for Russian, Welsh, Bosnian, Croatian, Serbian, Swiss, Arab, Hungarian, Ukrainian, Greek, Slovak, Lithuanian, Portuguese, and West Indian.[45]

The state's racial composition in the 2010 American Census Bureau was:[46]

In 1970, the Census Bureau reported Minnesota's population as 98.2% white.[47] In 2011, non-Hispanic whites were involved in 72.3% of all the births.[48] Minnesota's growing minority groups, however, still form a smaller percentage of the population than in the nation as a whole.[49]

[edit] Religion

The majority of Minnesotans are Protestants, including a significant Lutheran affiliation owing to the state's largely Northern European ethnic makeup, though Roman Catholics (of largely German, Irish, and Slavic descent) make up the largest single Christian denomination. A 2010 survey by the Pew Forum on Religion and Public Life showed that 32.0% of Minnesotans were affiliated with Mainline Protestant traditions, 21.0% with Evangelical Protestants, 28.0% with Roman Catholic, 1.0% each with Jewish, Muslim, Buddhist, and Black Protestant traditions, smaller amounts for other faiths, and 13.0% unaffiliated.[50] This is broadly consistent with the results of the 2001 American Religious Identification Survey, which also gives detail on percentages of many individual denominations.[51] Although Christianity is dominant, there is a long history of non-Christian faiths. Ashkenazi Jewish pioneers set up Saint Paul's first synagogue in 1856.[52] Eckankar's headquarters are located in Chanhassen, Minnesota.

[edit] Economy

Once primarily a producer of raw materials, Minnesota's economy has transformed to emphasize finished products and services. Perhaps the most significant characteristic of the economy is its diversity; the relative outputs of its business sectors closely match the United States as a whole.[53]

The economy of Minnesota had a gross domestic product of \$262 billion in 2008.[54] In 2008, thirty-three of the United States' top 1,000 publicly traded companies (by revenue) were headquartered in Minnesota,[55] including Target, UnitedHealth Group, 3M, Medtronic, General Mills, U.S. Bancorp, Ameriprise, Hormel, Land O' Lakes, SuperValu, Best Buy and Valspar. Private companies based in Minnesota include Cargill, the largest privately owned company in the United States,[56] and Carlson Companies, the parent company of Radisson Hotels.[57]

The per capita personal income in 2008 was \$42,772, the tenth-highest in the nation.[58] The three-year median household income from 2002 to 2004 was \$55,914, ranking fifth in the U.S. and first among the 36 states not on the Atlantic coast.[59]

As of January 2013, the state's unemployment rate is 5.5%.[60]

[edit] Industry and commerce

Minnesota's earliest industries were fur trading and agriculture; the city of Minneapolis grew around the flour mills powered by St. Anthony Falls. Although less than 1% of the population is employed in the agricultural sector,[62] it remains a major part of the state's economy, ranking 6th in the nation in the value of products sold.[63] The state is the U.S.'s largest producer of sugar beets, sweet corn, and green peas for processing, and farm-raised turkeys.[64] Minnesota has the most food cooperatives per capita in America.[65] Forestry remains strong, including logging, pulpwood processing and paper production, and forest products manufacturing. Minnesota was famous for its soft-ore mines, which produced a significant portion of the world's iron ore for over a century. Although the high-grade ore is now depleted, taconite mining continues, using processes developed locally to save the industry. In 2004, the state produced 75% of the country's usable iron ore.[64] The mining boom created the port of Duluth which continues to be important for shipping ore, coal, and agricultural products. The manufacturing sector now includes technology and biomedical firms in addition to the older food processors and heavy industry. The nation's first indoor shopping mall was Edina's Southdale Center and its largest is Bloomington's Mall of America.

Minnesota is one of 42 U.S. states with its own lottery; its games include Powerball, Hot Lotto (both multi-state), and Gopher 5.

[edit] Energy use and production

The state produces ethanol fuel and is the first to mandate its use, a 10% mix (E10).[66] In 2005 there were more than 310 service stations supplying E85 fuel, comprising 85& ethanol and 15% gasoline.[67] A 2% biodiesel blend has been required in diesel fuel since 2005. As of December 2006 the state was the country's fourth-largest producer of wind power, with 895Â megawatts installed and another 200Â megawatts planned, much of it on the windy Buffalo Ridge in the southwest part of the state.[68]

[edit] State taxes

Minnesota has a progressive income tax structure; the three brackets of state income tax rates are 5.35%, 7.05% and 7.85%.[69] As of 2008, Minnesota was ranked as 12th in the nation for per capita total state and local taxes.[70] In 2008, Minnesotans paid 10.2% of their income in state and local taxes, compared to the US average of 9.7% of income.[70] This ranks Minnesota 12th among the states for total state and local tax burden.[70] The state sales tax in Minnesota is 6.875%, but there is no sales tax on clothing, prescription drug medications, some services, or food items for home consumption.[71] The state legislature may allow municipalities to institute local sales taxes and special local taxes, such as the 0.5% supplemental sales tax in Minneapolis.[72] Excise taxes are levied on alcohol, tobacco, and motor fuel. The state imposes a use tax on items purchased elsewhere but used within Minnesota.[71] Owners of real property in Minnesota pay property tax to their county, municipality, school district, and special taxing districts.

[edit] Culture

[edit] Fine and performing arts

Minnesota's leading fine art museums include the Minneapolis Institute of Arts, the Walker Art Center, the Frederick R. Weisman Art Museum, and the The

Museum of Russian Art (TMORA). All are located in Minneapolis. The Minnesota Orchestra and the Saint Paul Chamber Orchestra are prominent full-time professional musical ensembles that perform concerts and offer educational programs to the Twin Cities' community. The world-renowned Guthrie Theater moved into a new Minneapolis facility in 2006, boasting three stages and overlooking the Mississippi River. Attendance at theatrical, musical, and comedy events in the area is strong. In the United States, the Twin Cities' number of theater seats per capita ranks behind only New York City;[73] with some 2.3 million theater tickets sold annually.[74] The Minnesota Fringe Festival is an annual celebration of theatre, dance, improvisation, puppetry, kids' shows, visual art, and musicals. The summer festival consists of over 800 performances over 11 days in Minneapolis, and is the largest non-juried performing arts festival in the United States.[75]

[edit] Literature

The rigors and rewards of pioneer life on the prairie were the subject of *Giants in the Earth* by Ole Rolvaag and of the *Little House* series of children's books by Laura Ingalls Wilder. Small-town life was attacked by Sinclair Lewis in the novel *Main Street*, and more gently and affectionately satirized by Garrison Keillor in his tales of Lake Wobegon. St. Paul native F. Scott Fitzgerald wrote of the social insecurities and aspirations of the young city in stories such as *Winter Dreams* and *The Ice Palace* (published in *Flappers and Philosophers*). Henry Wadsworth Longfellow's epic poem *The Song of Hiawatha* was inspired by Minnesota and names many of the state's places and bodies of water.

[edit] Entertainment

Minnesotan musicians of many genres include rock star Prince, harmony singers The Andrews Sisters, rockabilly star Eddie Cochran, folk musician Bob Dylan, surf band The Trashmen, garage rock band The Castaways, pop songwriters Jimmy Jam & Terry Lewis, indie rock artists Jonny Lang and Soul Asylum, independent hip-hop labels Rhymesayers Entertainment and Doomtree and cult favorites such as H&skier D& and The Replacements.

Minnesotans have made significant contributions to comedy, theater, and film. Ole and Lena jokes are best appreciated when delivered in the accent of Scandinavian Americans. Garrison Keillor is known around the country for resurrecting old-style radio comedy with *A Prairie Home Companion*, which has aired since the 1970s.[12] Local television had the satirical show *The Bedtime Nooz* in the 1960s, while area natives Lizz Winstead and Craig Kilborn helped create the increasingly influential *Daily Show* decades later. Actors from the state include Eddie Albert, Judy Garland, Jessica Lange, Seann William Scott, Josh Hartnett, Jessica Biel, Vince Vaughn, Rachael Leigh Cook, Steve Zahn, Kevin Sorbo, and Winona Ryder. Joel and Ethan Coen, Terry Gilliam and Mike Todd contributed to the art of film, and others brought the offbeat cult shows *Mystery Science Theater 3000* and *Let's Bowl* to national cable from the Twin Cities.

[edit] Popular culture

Stereotypical Minnesotan traits include manners known as "Minnesota nice", Lutheranism, a strong sense of community and shared culture, and their distinctive brand of North Central American English sprinkled with Scandinavian-sounding words such as *uff da*. Potlucks, usually with a variety of hotdish casseroles, are popular at community functions, especially church activities. Minnesota's Scandinavian heritage makes lutefisk a traditional holiday dish. Movies like *Fargo*, *The Mighty Ducks*, *Juno*, *A Serious Man*, *Drop Dead Gorgeous*, *New in Town*, *Jingle All the Way*, *Grumpy Old Men* and *Grumpier Old Men*; the television series *Mystery Science Theater 3000*, *The Golden Girls*, the *Mary Tyler Moore Show* and *Coach*; the radio show *A Prairie Home Companion*; and the book *How to Talk Minnesotan* lampoon (and celebrate) Minnesotan culture, speech and mannerisms.

The Minnesota State Fair, advertised as *The Great Minnesota Get-Together*, is an icon of state culture. In a state of 5.3 million people, there were almost 1.8 million visitors to the fair in 2009, breaking the previous record set in 2001.[76] The fair covers the variety of life in Minnesota, including fine art,

science, agriculture, food preparation, 4H displays, music, the midway, and corporate merchandising. It is known for its displays of seed art, butter sculptures of dairy princesses, the birthing barn, and the "fattest pig" competition. One can also find dozens of varieties of food on a stick, such as Pronto Pups, cheese curds, and deep fried candy bars. On a smaller scale, many of these attractions are offered at numerous county fairs.

Other large annual festivals include the Saint Paul Winter Carnival, the Minnesota Renaissance Festival, Minneapolis' Aquatennial and Mill City Music Festival, Moondance Jam in Walker, Sonshine Christian music festival in Willmar, the Judy Garland Festival in Grand Rapids, Eelpout Festival on Leech Lake, and WE Fest in Detroit Lakes.

[edit] Health

The people of Minnesota have a high rate of participation in outdoor activities; the state is ranked first in the percentage of residents who engage in regular exercise.[77]

Minnesotans have low rates of premature death, infant mortality, cardiovascular disease, and occupational fatalities,[78][79] long life expectancies,[80] and a high rate of health insurance.[78][81] These and other measures have led two groups to rank Minnesota as the healthiest state in the nation, but in one of these rankings Minnesota descended from first to sixth in the nation between 2005 and 2009, due to low levels of public health funding and prevalence of binge drinking.[78][82]

On October 1, 2007 Minnesota became the seventeenth state to enact a statewide smoking ban in restaurants and bars with the enactment of Freedom to Breathe Act.[83]

Medical care is provided by a comprehensive network of hospitals and clinics, headed by two institutions with international reputations. The University of Minnesota Medical School is a highly rated teaching institution that has made a number of breakthroughs in treatment, and its research activities contribute significantly to the state's growing biotechnology industry.[84] The Mayo Clinic, a world-renowned medical practice, is based in Rochester. Mayo and the University are partners in the Minnesota Partnership for Biotechnology and Medical Genomics, a state-funded program that conducts research into cancer, Alzheimer's disease, heart health, obesity, and other areas.[85]

[edit] Education

One of the first acts of the Minnesota Legislature when it opened in 1858 was the creation of a normal school at Winona. This commitment to education has contributed to a literate and well-educated population;[86] the state ranked 13th on the 2006â ^2007 Morgan Quitno Smartest State Award, and is first in the percentage of residents with at least a high school diploma.[87][88] But while more than 90% of high school seniors graduated in 2006, about 6% of white, 28% of African American, 30% of Asian American and more than 34% of Hispanic and Native American students dropped out of school.[89] In 2007 Minnesota students earned the highest average score in the nation on the ACT exam.[90] While Minnesota has chosen not to implement school vouchers,[91] it is home to the first charter school.[92]

The state supports a network of public universities and colleges, including 32 institutions in the Minnesota State Colleges and Universities System, and five major campuses of the University of Minnesota. It is also home to more than 20 private colleges and universities, six of which rank among the nation's top 100 liberal arts colleges, according to U.S. News & World Report.[93]

[edit] Transportation

Transportation in Minnesota is overseen by the Minnesota Department of Transportation (MnDOT for short and used in the local news media). Principal transportation corridors radiate from the Minneapolisâ ^St. Paul metropolitan area and Duluth. The major Interstate highways are I-35, I-90, and I-94, with I-35 and I-94 passing through the Minneapolisâ ^St. Paul metropolitan area, and I-90 going east-west along the southern edge of the state.[94] In 2006, a constitutional amendment was passed that required sales and use taxes on motor vehicles to fund transportation, with at least 40% dedicated to public

transit.[95] There are nearly two dozen rail corridors in Minnesota, most of which go through Minneapolisâ ^St. Paul or Duluth.[96] There is water transportation along the Mississippi River system and from the ports of Lake Superior.[97]

Minnesota's principal airport is Minneapolisâ ^St. Paul International Airport (MSP), a major passenger and freight hub for Delta Air Lines and Sun Country Airlines. Most other domestic carriers serve the airport. Large commercial jet service is provided at Duluth and Rochester, with scheduled commuter service to six smaller cities via Delta Connection carriers Comair, Mesaba Airlines, SkyWest Airlines, Compass Airlines' and Pinnacle Airlines.[98][99]

Amtrak's daily Empire Builder (Chicagoâ ^Seattle/Portland) train runs through Minnesota, calling at Midway Station in St. Paul and five other stations.[100] Intercity bus providers include Jefferson Lines, Greyhound, and Megabus. Local public transit is provided by bus networks in the larger cities and by two rail lines: The Northstar Line commuter rail service runs from Big Lake to downtown Minneapolis, and the Hiawatha Line electrified light rail service runs from the Northstar's terminus to the MSP Airport and Bloomington.

[edit] Law and government

As with the federal government of the United States, power in Minnesota is divided into three branches: executive, legislative, and judicial.[101]

[edit] Executive

The executive branch is headed by the governor. Governor Mark Dayton, a Democrat, took office on January 3, 2011, to become the first Democratic Governor to hold the seat in two decades. The governor has a cabinet consisting of the leaders of various state government agencies, called commissioners. The other elected constitutional offices are secretary of state, attorney general, and state auditor.

[edit] Legislature

The Minnesota Legislature is a bicameral body consisting of the Senate and the House of Representatives. The state has sixty-seven districts, each covering about sixty thousand people. Each district has one senator and two representatives (each district being divided into A and B sections). Senators serve for four years and representatives for two years. In the November 2010 election, the Minnesota Republican Party gained twenty-five house seats, giving them control of the House of Representatives by a 72-62 margin.[102] The 2010 election also saw Minnesota voters elect a Republican majority in the Senate for the first time since 1972.

[edit] Judiciary

Minnesota's court system has three levels. Most cases start in the district courts, which are courts of general jurisdiction. There are 279 district court judgeships in ten judicial districts. Appeals from the trial courts and challenges to certain governmental decisions are heard by the Minnesota Court of Appeals, consisting of nineteen judges who typically sit in three-judge panels. The seven-justice Minnesota Supreme Court hears all appeals from the Tax Court, the Workers' Compensation Court of Appeals, first-degree murder convictions, and discretionary appeals from the Court of Appeals; it also has original jurisdiction over election disputes.[103]

Two specialized courts within administrative agencies have been established: the Workers' Compensation Court of Appeals, and the Tax Court, which deals with non-criminal tax cases.

[edit] Regional

In addition to the city and county levels of government found in the United States, Minnesota has other entities that provide governmental oversight and planning. Some actions in the Twin Cities metropolitan area are coordinated by the Metropolitan Council, and many lakes and rivers are overseen by watershed districts and soil and water conservation districts.

There are seven Anishinaabe reservations and four Dakota self-governing communities in Minnesota.[104]

[edit] Federal

Minnesota's United States senators are Democrat Amy Klobuchar and Democrat Al

Franken. The outcome of the 2008 U.S. Senate election in Minnesota was contested until June 30 the next year; when the Minnesota Supreme Court ruled in favor of Franken, Republican Norm Coleman conceded defeat, and the vacant seat was filled by Franken.[105] The state has eight congressional districts; they are represented by Tim Walz (1st district; DFL), John Kline (2nd; R), Erik Paulsen (3rd; R), Betty McCollum (4th; DFL), Keith Ellison (5th; DFL), Michele Bachmann (6th; R), Collin Peterson (7th; DFL), and Chip Cravaack (8th; R).

Federal court cases are heard in the United States District Court for the District of Minnesota, which holds court in Minneapolis, St. Paul, Duluth, and Fergus Falls. Appeals are heard by the Eighth Circuit Court of Appeals, which is based in St. Louis, Missouri and routinely also hears cases in St. Paul.

[edit] Politics

Minnesota is known for a politically active citizenry, and populism has been a longstanding force among the state's political parties.[107][108] Minnesota has a consistently high voter turnout (due in part to its liberal voter registration laws) "with virtually no evidence of unlawful voting".[109] In the 2008 U.S. presidential election, 77.9% of eligible Minnesotans votedâ ~the highest percentage of any U.S. stateâ ~versus the national average of 61.2%.[110] Previously unregistered voters can register on election day at their polls with evidence of residency.[111]

Hubert Humphrey brought national attention to the state with his address at the 1948 Democratic National Convention. Eugene McCarthy's anti-war stance and popularity in the 1968 New Hampshire primary likely convinced Lyndon B. Johnson to drop out of the presidential election. Minnesotans have consistently cast their Electoral College votes for Democratic presidential candidates since 1976, longer than any other state. Minnesota is the only state in the nation that did not vote for Ronald Reagan in either of his presidential runs. Minnesota has gone to the Democratic Party in every Presidential Election since 1960, with the exception of 1972, when it was carried by Richard Nixon and the Republican Party.

Both the Democratic and Republican parties have major party status in Minnesota, but its state-level "Democratic" party is actually a separate party, officially known as the Minnesota Democratic-Farmer-Labor Party (DFL). Formed out of a 1944 alliance of the Minnesota Democratic and Farmer-Labor parties, the DFL now serves as a de facto proxy to the federal Democratic Party, and its distinction from the Democratic Party, while still official, is now a functional technicality.

The state has had active third party movements. The Reform Party, now the Independence Party, was able to elect former mayor of Brooklyn Park and professional wrestler Jesse Ventura to the governorship in 1998. The Independence Party has received enough support to keep major party status. The Green Party, while no longer having major party status, has a large presence in municipal government,[112] notably in Minneapolis and Duluth, where it competes directly with the DFL party for local offices. Official "Major party" status in Minnesota (which grants state funding for elections) is reserved to parties whose candidates receive 5% or more of the vote in any statewide election (e.g., Governor, Secretary of State, U.S. President).

The state's U.S. Senate seats have generally been split since the early 1990s, and in the 108th and 109th Congresses, Minnesota's congressional delegation was split, with four representatives and one senator from each party. In the 2006 midterm election, Democrats were elected to all state offices except for governor and lieutenant governor, where Republicans Tim Pawlenty and Carol Molnau narrowly won re-election. The DFL also posted double-digit gains in both houses of the legislature, elected Amy Klobuchar to the U.S. Senate, and increased the party's U.S. House caucus by one. Keith Ellison (DFL) was elected as the first African American U.S. Representative from Minnesota as well as the first Muslim elected to Congress nationwide.[113] In 2008 DFLer and former comedian and radio talk show host Al Franken beat incumbent Republican Norm Coleman in the United States Senate race by only a few hundred votes out of 3 million cast.

In the election of 2010, Republicans took control of both chambers of the Minnesota legislature for the first time in 38 years, and Mark Dayton of the Democratic-Farmer-Labor party took the governor's office for the first time in 20 years. Two years later, the DFL regained control of both houses, and with Governor Dayton in office, the party has same-party control of both the legislative and executive branches for the first time since 1990.

The Twin Cities area is the fifteenth largest media market in the United States as ranked by Nielsen Media Research. The state's other top markets are Fargoâ ^Moorhead (118th nationally), Duluthâ ^Superior (137th), Rochesterâ ^Mason Cityâ ^Austin (152nd), and Mankato (200th).[114]

Broadcast television in Minnesota and the Upper Midwest started on April 27, 1948, when KSTP-TV began broadcasting.[115] Hubbard Broadcasting, which owns KSTP, is now the only locally owned television company in Minnesota. There are currently 39 analog broadcast stations and 23 digital channels broadcast over Minnesota.

The four largest daily newspapers are the Star Tribune in Minneapolis, the Pioneer Press in Saint Paul, the Duluth News Tribune in Duluth and The Minnesota Daily, the largest student-run newspaper in the U.S.[116] Sites offering daily news on the Web include The UpTake, MinnPost, the Twin Cities Daily Planet, business news site Finance and Commerce (web site) and Washington D.C.-based Minnesota Independent. Weeklies including City Pages and monthly publications such as Minnesota Monthly are available.

Two of the largest public radio networks, Minnesota Public Radio (MPR) and Public Radio International (PRI), are based in the state. MPR has the largest audience of any regional public radio network in the nation, broadcasting on 37 radio stations.[117] PRI weekly provides more than 400 hours of programming to almost 800 affiliates.[118] The state's oldest radio station, KUOM-AM, was launched in 1922 and is among the 10 â ^oldest radio stations in the United States. The University of Minnesota-owned station is still on the air, and since 1993 broadcasts a college rock format.

[edit] Sports and recreation

[edit] Organized sports

Minnesota has professional men's teams in all major sports. The Hubert H. Humphrey Metrodome is home to the Minnesota Vikings of the National Football League. The building formerly hosted the Minnesota Twins of Major League Baseball, winners of the 1987 and 1991 World Series. The Twins began playing at Target Field in 2010. The Minnesota Timberwolves of the National Basketball Association play in the Target Center. The National Hockey League's Minnesota Wild team reached 300 consecutive sold-out games in St. Paul's Xcel Energy Center on January 16, 2008.[119] The Minnesota Stars FC replaced the United Soccer League Minnesota Thunder in 2010 and plays at the National Sports Center in Blaine.[120]

Minor league baseball is represented both by major league-sponsored teams and independent teams such as the popular St. Paul Saints.

Professional women's sports include the Minnesota Lynx of the Women's National Basketball Association, winners of the 2011 WNBA Championship, the Minnesota Lightning of the United Soccer Leagues W-League, the Minnesota Vixen of the Independent Women's Football League, the Minnesota Valkyrie of the Lingerie Football League and the Minnesota Whitecaps of the National Women's Hockey League.

The Twin Cities campus of the University of Minnesota is a National Collegiate Athletic Association (NCAA) Division I school, with the university's sports teams competing in either the Big Ten Conference or the Western Collegiate Hockey Association. Four additional schools in the state compete in NCAA Division I ice hockey: the University of Minnesota Duluth; Minnesota State University, Mankato; St. Cloud State University and Bemidji State University. There are nine NCAA Division II colleges in the Northern Sun Intercollegiate Conference, and nineteen NCAA Division III colleges in the Minnesota Intercollegiate Athletic Conference and Upper Midwest Athletic Conference.[121][122]

Winter Olympic Games medallists from the state include twelve of the twenty members of the gold medal 1980 ice hockey team (coached by Minnesota native Herb Brooks) and the bronze medallist U.S. men's curling team in the 2006 Winter Olympics. Swimmer Tom Malchow won an Olympic gold medal in the 2000 Summer games and a silver medal in 1996.

Grandma's Marathon is run every summer along the scenic North Shore of Lake Superior, and the Twin Cities Marathon winds around lakes and the Mississippi River during the peak of the fall color season. Farther north, Eveleth is the location of the United States Hockey Hall of Fame.

[edit] Outdoor recreation

Minnesotans participate in high levels of physical activity,[123] and many of these activities are outdoors. The strong interest of Minnesotans in environmentalism has been attributed to the popularity of these pursuits.[124]

In the warmer months, these activities often involve water. Weekend and longer trips to family cabins on Minnesota's numerous lakes are a way of life for many residents. Activities include water sports such as water skiing, which originated in the state,[125]boating, canoeing, and fishing. More than 36% of Minnesotans fish, second only to Alaska.[126]

Fishing does not cease when the lakes freeze; ice fishing has been around since the arrival of early Scandinavian immigrants.[127] Minnesotans have learned to embrace their long, harsh winters in ice sports such as skating, hockey, curling, and broomball, and snow sports such as cross-country skiing, alpine skiing, snowshoeing, and snowmobiling.[128]

State and national forests and the seventy-two state parks are used year-round for hunting, camping, and hiking. There are almost 20,000 miles (32,000 km) of snowmobile trails statewide.[129] Minnesota has more miles of bike trails than any other state,[130] and a growing network of hiking trails, including the 235-mile (378 km) Superior Hiking Trail in the northeast.[131] Many hiking and bike trails are used for cross-country skiing during the winter.

[edit] State symbols

Minnesota's state symbols:[133]

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[edit] External links

Government

Tourism & recreation

Culture & history

Maps and Demographics

Coordinates: 46°N 94°W﻿♂﻿♀ / ﻿♂﻿♀46°N 94°W﻿♂﻿♀ / 46; -94

In mathematics, the repeating decimal 0.999... (sometimes written with more or fewer 9s before the final ellipsis, or as 0.9, , 0.(9)) denotes a real number that can be shown to be the number one. In other words, the symbols "0.999..." and "1" represent the same number. Proofs of this equality have been formulated with varying degrees of mathematical rigor, taking into account preferred development of the real numbers, background assumptions, historical context, and target audience.

Every nonzero, terminating decimal has an equal twin representation with trailing 9s, such as 8.32 and 8.31999... The terminating decimal representation is almost always preferred, contributing to the misconception that it is the only representation. The same phenomenon occurs in all other bases or in any similar representation of the real numbers.

The equality of 0.999... and 1 is closely related to the absence of nonzero infinitesimals in the real number system, the most commonly used system in mathematical analysis. Some alternative number systems, such as the hyperreals, do contain nonzero infinitesimals. In most such number systems, the standard interpretation of the expression 0.999... makes it equal to 1, but in some of these number systems, the symbol "0.999..." admits other interpretations that contain infinitely many 9s while falling infinitesimally short of 1.

The equality $0.999\ldots = 1$ has long been accepted by mathematicians and is part of general mathematical education. Nonetheless, some students find it sufficiently counterintuitive that they question or reject it, commonly enough that the difficulty of convincing them of the validity of this identity has been the subject of several studies in mathematics education.

[edit] Algebraic proofs

Algebraic proofs showing that 0.999... represents the number 1 use concepts such as fractions, long division, and digit manipulation to build transformations preserving equality from 0.999... to 1.

[edit] Fractions and long division

One reason that infinite decimals are a necessary extension of finite decimals is to represent fractions. Using long division, a simple division of integers like $1 \div 9$ becomes a recurring decimal, $0.111\ldots$, in which the digits repeat

without end. This decimal yields a quick proof for $0.999\ldots = 1$. Multiplication of 9 times 1 produces 9 in each digit, so $9 \times 0.111\ldots$ equals $0.999\ldots$ and $9 \times 1\ldots 9$ equals 1, so $0.999\ldots = 1$:

Another form of this proof multiplies $1\ldots 3 = 0.333\ldots$ by 3.

[edit] Digit manipulation

When a number in decimal notation is multiplied by 10, the digits do not change but each digit moves one place to the left. Thus $10 \times 0.999\ldots$ equals $9.999\ldots$, which is 9 greater than the original number. To see this, consider that in subtracting $0.999\ldots$ from $9.999\ldots$, each of the digits after the decimal separator cancels, i.e. the result is $9\ldots 9\ldots 0$ for each such digit. The final step uses algebra:

[edit] Discussion

Although these proofs demonstrate that $0.999\ldots = 1$, the extent to which they explain the equation depends on the audience. In introductory arithmetic, such proofs help explain why $0.999\ldots = 1$ but $0.333\ldots < 0.4$. And in introductory algebra, the proofs help explain why the general method of converting between fractions and repeating decimals works. But the proofs shed little light on the fundamental relationship between decimals and the numbers they represent, which underlies the question of how two different decimals can be said to be equal at all.[1] William Byers argues that a student who agrees that $0.999\ldots = 1$ because of the above proofs, but hasn't resolved the ambiguity, doesn't really understand the equation.[2] Fred Richman argues that the first argument "gets its force from the fact that most people have been indoctrinated to accept the first equation without thinking".[3]

Once a representation scheme is defined, it can be used to justify the rules of decimal arithmetic used in the above proofs. Moreover, one can directly demonstrate that the decimals $0.999\ldots$ and $1.000\ldots$ both represent the same real number; it is built into the definition. This is done below.

[edit] Analytic proofs

Since the question of $0.999\ldots$ does not affect the formal development of mathematics, it can be postponed until one proves the standard theorems of real analysis. One requirement is to characterize real numbers that can be written in decimal notation, consisting of an optional sign, a finite sequence of any number of digits forming an integer part, a decimal separator, and a sequence of digits forming a fractional part. For the purpose of discussing $0.999\ldots$, the integer part can be summarized as b_0 and one can neglect negatives, so a decimal expansion has the form

It should be noted that the fraction part, unlike the integer part, is not limited to a finite number of digits. This is a positional notation, so for example the 5 in 500 contributes ten times as much as the 5 in 50, and the 5 in 0.05 contributes one tenth as much as the 5 in 0.5.

[edit] Infinite series and sequences

Perhaps the most common development of decimal expansions is to define them as sums of infinite series. In general:

For $0.999\ldots$ one can apply the convergence theorem concerning geometric series:[4]

If then

Since $0.999\ldots$ is such a sum with a common ratio $r = 1\ldots 10$, the theorem makes short work of the question:

This proof (actually, that 10 equals $9.999\ldots$) appears as early as 1770 in Leonhard Euler's Elements of Algebra.[5]

The sum of a geometric series is itself a result even older than Euler. A typical 18th-century derivation used a term-by-term manipulation similar to the algebraic proof given above, and as late as 1811, Bonnycastle's textbook An Introduction to Algebra uses such an argument for geometric series to justify

the same maneuver on $0.999\dots$ [6] A 19th-century reaction against such liberal summation methods resulted in the definition that still dominates today: the sum of a series is defined to be the limit of the sequence of its partial sums. A corresponding proof of the theorem explicitly computes that sequence; it can be found in any proof-based introduction to calculus or analysis.[7]

A sequence (x_0, x_1, x_2, \dots) has a limit x if the distance $|x_n - x|$ becomes arbitrarily small as n increases. The statement that $0.999\dots = 1$ can itself be interpreted and proven as a limit:[8]

The last step, that $1 - 10^{-n} > 0$ as $n \rightarrow \infty$, is often justified by the Archimedean property of the real numbers. This limit-based attitude towards $0.999\dots$ is often put in more evocative but less precise terms. For example, the 1846 textbook *The University Arithmetic* explains, ".999 +, continued to infinity = 1, because every annexation of a 9 brings the value closer to 1"; the 1895 *Arithmetic for Schools* says, "...when a large number of 9s is taken, the difference between 1 and .99999... becomes inconceivably small".[9] Such heuristics are often interpreted by students as implying that $0.999\dots$ itself is less than 1.

[edit] Nested intervals and least upper bounds

The series definition above is a simple way to define the real number named by a decimal expansion. A complementary approach is tailored to the opposite process: for a given real number, define the decimal expansion(s) to name it.

If a real number x is known to lie in the closed interval $[0, 10]$ (i.e., it is greater than or equal to 0 and less than or equal to 10), one can imagine dividing that interval into ten pieces that overlap only at their endpoints: $[0, 1]$, $[1, 2]$, $[2, 3]$, and so on up to $[9, 10]$. The number x must belong to one of these; if it belongs to $[2, 3]$ then one records the digit "2" and subdivides that interval into $[2, 2.1]$, $[2.1, 2.2]$, ..., $[2.8, 2.9]$, $[2.9, 3]$. Continuing this process yields an infinite sequence of nested intervals, labeled by an infinite sequence of digits $b_0, b_1, b_2, b_3, \dots$, and one writes

In this formalism, the identities $1 = 0.999\dots$ and $1 = 1.000\dots$ reflect, respectively, the fact that 1 lies in both $[0, 1]$ and $[1, 2]$, so one can choose either subinterval when finding its digits. To ensure that this notation does not abuse the "=" sign, one needs a way to reconstruct a unique real number for each decimal. This can be done with limits, but other constructions continue with the ordering theme.[10]

One straightforward choice is the nested intervals theorem, which guarantees that given a sequence of nested, closed intervals whose lengths become arbitrarily small, the intervals contain exactly one real number in their intersection. So $b_0.b_1b_2b_3\dots$ is defined to be the unique number contained within all the intervals $[b_0, b_0 + 1]$, $[b_0.b_1, b_0.b_1 + 0.1]$, and so on. $0.999\dots$ is then the unique real number that lies in all of the intervals $[0, 1]$, $[0.9, 1]$, $[0.99, 1]$, and $[0.99\dots9, 1]$ for every finite string of 9s. Since 1 is an element of each of these intervals, $0.999\dots = 1$. [11]

The Nested Intervals Theorem is usually founded upon a more fundamental characteristic of the real numbers: the existence of least upper bounds or suprema. To directly exploit these objects, one may define $b_0.b_1b_2b_3\dots$ to be the least upper bound of the set of approximants $\{b_0, b_0.b_1, b_0.b_1b_2, \dots\}$. [12] One can then show that this definition (or the nested intervals definition) is consistent with the subdivision procedure, implying $0.999\dots = 1$ again. Tom Apostol concludes,

The fact that a real number might have two different decimal representations is merely a reflection of the fact that two different sets of real numbers can have the same supremum. [13]

[edit] Proofs from the construction of the real numbers

Some approaches explicitly define real numbers to be certain structures built upon the rational numbers, using axiomatic set theory. The natural numbers $\hat{=}$ 0,

as real numbers if the sequence $(x_n \wedge y_n)$ has the limit 0. Truncations of the decimal number $0.b_1b_2b_3\dots$ generate a sequence of rationals which is Cauchy; this is taken to define the real value of the number.[22] Thus in this formalism the task is to show that the sequence of rational numbers

has the limit 0. Considering the n th term of the sequence, for $n=0,1,2,\dots$, it must therefore be shown that

This limit is plain:[23] one possible proof is that for $\hat{\mu} = a/b > 0$ one can take $N \hat{=} b$ in the definition of the limit of a sequence. So again $0.999\dots \hat{=} 1$.

The definition of real numbers as Cauchy sequences was first published separately by Eduard Heine and Georg Cantor, also in 1872.[18] The above approach to decimal expansions, including the proof that $0.999\dots = 1$, closely follows Griffiths & Hilton's 1970 work A comprehensive textbook of classical mathematics: A contemporary interpretation. The book is written specifically to offer a second look at familiar concepts in a contemporary light.[24]

[edit] Generalizations

The result that $0.999\dots = 1$ generalizes readily in two ways. First, every nonzero number with a finite decimal notation (equivalently, endless trailing 0s) has a counterpart with trailing 9s. For example, $0.24999\dots$ equals 0.25 , exactly as in the special case considered. These numbers are exactly the decimal fractions, and they are dense.[25]

Second, a comparable theorem applies in each radix or base. For example, in base 2 (the binary numeral system) $0.111\dots$ equals 1, and in base 3 (the ternary numeral system) $0.222\dots$ equals 1. Textbooks of real analysis are likely to skip the example of $0.999\dots$ and present one or both of these generalizations from the start.[26]

Alternative representations of 1 also occur in non-integer bases. For example, in the golden ratio base, the two standard representations are $1.000\dots$ and $0.101010\dots$, and there are infinitely many more representations that include adjacent 1s. Generally, for almost all q between 1 and 2, there are uncountably many base- q expansions of 1. On the other hand, there are still uncountably many q (including all natural numbers greater than 1) for which there is only one base- q expansion of 1, other than the trivial $1.000\dots$. This result was first obtained by Paul Erdős, Miklos Horváth, and István Jónás around 1990. In 1998 Vilmos Komornik and Paola Loreti determined the smallest such base, the Komornik–Loreti constant $q = 1.787231650\dots$. In this base, $1 = 0.11010011001011010010110011010011\dots$; the digits are given by the Thue–Morse sequence, which does not repeat.[27]

A more far-reaching generalization addresses the most general positional numeral systems. They too have multiple representations, and in some sense the difficulties are even worse. For example:[28]

[edit] Impossibility of unique representation

That all these different number systems suffer from multiple representations for some real numbers can be attributed to a fundamental difference between the real numbers as an ordered set and collections of infinite strings of symbols, ordered lexicographically. Indeed the following two properties account for the difficulty:

If an interval of the real numbers is partitioned into two non-empty parts L , R , such that every element of L is (strictly) less than every element of R , then either L contains a largest element or R contains a smallest element, but not both.

The collection of infinite strings of symbols taken from any finite "alphabet", lexicographically ordered, can be partitioned into two non-empty parts L , R , such that every element of L is less than every element of R , while L contains a largest element and R contains a smallest element. Indeed it suffices to take two finite prefixes (initial substrings) p_1 , p_2 of elements from the collection such that they differ only in their final symbol, for which symbol they have

successive values, and take for L the set of all strings in the collection whose corresponding prefix is at most p_1 , and for R the remainder, the strings in the collection whose corresponding prefix is at least p_2 . Then L has a largest element, starting with p_1 and choosing the largest available symbol in all following positions, while R has a smallest element obtained by following p_2 by the smallest symbol in all positions.

The first point follows from basic properties of the real numbers: L has a supremum and R has an infimum, which are easily seen to be equal; being a real number it either lies in R or in L , but not both since L and R are supposed to be disjoint. The second point generalizes the $0.999\dots/1.000\dots$ pair obtained for $p_1 \hat{=} \hat{=} "0"$, $p_2 \hat{=} \hat{=} "1"$. In fact one need not use the same alphabet for all positions (so that for instance mixed radix systems can be included) or consider the full collection of possible strings; the only important points are that at each position a finite set of symbols (which may even depend on the previous symbols) can be chosen from (this is needed to ensure maximal and minimal choices), and that making a valid choice for any position should result in a valid infinite string (so one should not allow "9" in each position while forbidding an infinite succession of "9"s). Under these assumptions, the above argument shows that an order preserving map from the collection of strings to an interval of the real numbers cannot be a bijection: either some numbers do not correspond to any string, or some of them correspond to more than one string.

Marko Petkovšek has proven that for any positional system that names all the real numbers, the set of reals with multiple representations is always dense. He calls the proof "an instructive exercise in elementary point-set topology"; it involves viewing sets of positional values as Stone spaces and noticing that their real representations are given by continuous functions.[29]

[edit] Applications

One application of $0.999\dots$ as a representation of 1 occurs in elementary number theory. In 1802, H. Goodwin published an observation on the appearance of 9s in the repeating-decimal representations of fractions whose denominators are certain prime numbers. Examples include:

$1/7 = 0.142857142857\dots$ and $142 + 857 = 999$.

$1/73 = 0.0136986301369863\dots$ and $0136 + 9863 = 9999$.

E. Midy proved a general result about such fractions, now called Midy's theorem, in 1836. The publication was obscure, and it is unclear if his proof directly involved $0.999\dots$, but at least one modern proof by W. G. Leavitt does. If it can be proved that a decimal of the form $0.b_1b_2b_3\dots$ is a positive integer, then it must be $0.999\dots$, which is then the source of the 9s in the theorem.[30] Investigations in this direction can motivate such concepts as greatest common divisors, modular arithmetic, Fermat primes, order of group elements, and quadratic reciprocity.[31]

Returning to real analysis, the base-3 analogue $0.222\dots = 1$ plays a key role in a characterization of one of the simplest fractals, the middle-thirds Cantor set:

A point in the unit interval lies in the Cantor set if and only if it can be represented in ternary using only the digits 0 and 2.

The n th digit of the representation reflects the position of the point in the n th stage of the construction. For example, the point $2/3$ is given the usual representation of 0.2 or $0.2000\dots$, since it lies to the right of the first deletion and to the left of every deletion thereafter. The point $1/3$ is represented not as 0.1 but as $0.0222\dots$, since it lies to the left of the first deletion and to the right of every deletion thereafter.[32]

Repeating nines also turn up in yet another of Georg Cantor's works. They must be taken into account to construct a valid proof, applying his 1891 diagonal argument to decimal expansions, of the uncountability of the unit interval. Such a proof needs to be able to declare certain pairs of real numbers to be different based on their decimal expansions, so one needs to avoid pairs like 0.2 and $0.1999\dots$. A simple method represents all numbers with nonterminating expansions; the opposite method rules out repeating nines.[33] A variant that

may be closer to Cantor's original argument actually uses base 2, and by turning base-3 expansions into base-2 expansions, one can prove the uncountability of the Cantor set as well.[34]

[edit] Skepticism in education

Students of mathematics often reject the equality of $0.999\ldots$ and 1, for reasons ranging from their disparate appearance to deep misgivings over the limit concept and disagreements over the nature of infinitesimals. There are many common contributing factors to the confusion:

Students are often "mentally committed to the notion that a number can be represented in one and only one way by a decimal." Seeing two manifestly different decimals representing the same number appears to be a paradox, which is amplified by the appearance of the seemingly well-understood number 1.[35] Some students interpret " $0.999\ldots$ " (or similar notation) as a large but finite string of 9s, possibly with a variable, unspecified length. If they accept an infinite string of nines, they may still expect a last 9 "at infinity".[36] Intuition and ambiguous teaching lead students to think of the limit of a sequence as a kind of infinite process rather than a fixed value, since a sequence need not reach its limit. Where students accept the difference between a sequence of numbers and its limit, they might read " $0.999\ldots$ " as meaning the sequence rather than its limit.[37]

These ideas are mistaken in the context of the standard real numbers, although some may be valid in other number systems, either invented for their general mathematical utility or as instructive counterexamples to better understand $0.999\ldots$.

Many of these explanations were found by David Tall, who has studied characteristics of teaching and cognition that lead to some of the misunderstandings he has encountered in his college students. Interviewing his students to determine why the vast majority initially rejected the equality, he found that "students continued to conceive of $0.999\ldots$ as a sequence of numbers getting closer and closer to 1 and not a fixed value, because 'you haven't specified how many places there are' or 'it is the nearest possible decimal below 1'".[38]

Of the elementary proofs, multiplying $0.333\ldots = \frac{1}{3}$ by 3 is apparently a successful strategy for convincing reluctant students that $0.999\ldots = 1$. Still, when confronted with the conflict between their belief of the first equation and their disbelief of the second, some students either begin to disbelieve the first equation or simply become frustrated.[39] Nor are more sophisticated methods foolproof: students who are fully capable of applying rigorous definitions may still fall back on intuitive images when they are surprised by a result in advanced mathematics, including $0.999\ldots$. For example, one real analysis student was able to prove that $0.333\ldots = \frac{1}{3}$ using a supremum definition, but then insisted that $0.999\ldots < 1$ based on her earlier understanding of long division.[40] Others still are able to prove that $\frac{1}{3} = 0.333\ldots$, but, upon being confronted by the fractional proof, insist that "logic" supersedes the mathematical calculations.

Joseph Mazur tells the tale of an otherwise brilliant calculus student of his who "challenged almost everything I said in class but never questioned his calculator," and who had come to believe that nine digits are all one needs to do mathematics, including calculating the square root of 23. The student remained uncomfortable with a limiting argument that $9.99\ldots = 10$, calling it a "wildly imagined infinite growing process." [41]

As part of Ed Dubinsky's APOS theory of mathematical learning, he and his collaborators (2005) propose that students who conceive of $0.999\ldots$ as a finite, indeterminate string with an infinitely small distance from 1 have "not yet constructed a complete process conception of the infinite decimal". Other students who have a complete process conception of $0.999\ldots$ may not yet be able to "encapsulate" that process into an "object conception", like the object conception they have of 1, and so they view the process $0.999\ldots$ and the object 1 as incompatible. Dubinsky et al. also link this mental ability of encapsulation to viewing $\frac{1}{3}$ as a number in its own right and to dealing with

the set of natural numbers as a whole.[42]

[edit] In popular culture

With the rise of the Internet, debates about $0.999\dots$ have escaped the classroom and are commonplace on newsgroups and message boards, including many that nominally have little to do with mathematics. In the newsgroup sci.math, arguing over $0.999\dots$ is a "popular sport", and it is one of the questions answered in its FAQ.[43] The FAQ briefly covers 10^3 , multiplication by 10, and limits, and it alludes to Cauchy sequences as well.

A 2003 edition of the general-interest newspaper column The Straight Dope discusses $0.999\dots$ via 10^3 and limits, saying of misconceptions,

The lower primate in us still resists, saying: $.999\sim$ doesn't really represent a number, then, but a process. To find a number we have to halt the process, at which point the $.999\sim = 1$ thing falls apart. Nonsense.[44]

The Straight Dope cites a discussion on its own message board that grew out of an unidentified "other message board ... mostly about video games". In the same vein, the question of $0.999\dots$ proved such a popular topic in the first seven years of Blizzard Entertainment's Battle.net forums that the company issued a "press release" on April Fools' Day 2004 that it is 1:

We are very excited to close the book on this subject once and for all. We've witnessed the heartache and concern over whether $.999\sim$ does or does not equal 1, and we're proud that the following proof finally and conclusively addresses the issue for our customers.[45]

Two proofs are then offered, based on limits and multiplication by 10.

$0.999\dots$ features also in mathematical folklore, specifically in the following joke:[46]

Q: How many mathematicians does it take to screw in a lightbulb?

A: $0.999999\dots$

[edit] In alternative number systems

Although the real numbers form an extremely useful number system, the decision to interpret the notation " $0.999\dots$ " as naming a real number is ultimately a convention, and Timothy Gowers argues in Mathematics: A Very Short Introduction that the resulting identity $0.999\dots = 1$ is a convention as well:

However, it is by no means an arbitrary convention, because not adopting it forces one either to invent strange new objects or to abandon some of the familiar rules of arithmetic.[47]

One can define other number systems using different rules or new objects; in some such number systems, the above proofs would need to be reinterpreted and one might find that, in a given number system, $0.999\dots$ and 1 might not be identical. However, many number systems are extensions of \mathbb{R} rather than independent alternatives to \mathbb{R} the real number system, so $0.999\dots = 1$ continues to hold. Even in such number systems, though, it is worthwhile to examine alternative number systems, not only for how $0.999\dots$ behaves (if, indeed, a number expressed as " $0.999\dots$ " is both meaningful and unambiguous), but also for the behavior of related phenomena. If such phenomena differ from those in the real number system, then at least one of the assumptions built into the system must break down.

[edit] Infinitesimals

Main article: Infinitesimal

Some proofs that $0.999\dots = 1$ rely on the Archimedean property of the real numbers: that there are no nonzero infinitesimals. Specifically, the difference

$1 - \epsilon$ must be smaller than any positive rational number, so it must be an infinitesimal; but since the reals do not contain nonzero infinitesimals, the difference is therefore zero, and therefore the two values are the same.

However, there are mathematically coherent ordered algebraic structures, including various alternatives to the real numbers, which are non-Archimedean. For example, the dual numbers include a new infinitesimal element ϵ , analogous to the imaginary unit i in the complex numbers except that $\epsilon^2 = 0$. The resulting structure is useful in automatic differentiation. The dual numbers can be given a lexicographic order, in which case the multiples of ϵ become non-Archimedean elements.[48] Note however that, as an extension of the real numbers, the dual numbers still have $0.999... = 1$. On a related note, while ϵ exists in dual numbers, so does $\epsilon/2$, so ϵ is not "the smallest positive dual number," and, indeed, as in the reals, no such number exists.

Non-standard analysis provides a number system with a full array of infinitesimals (and their inverses).[49] A. H. Lightstone developed a decimal expansion for hyperreal numbers in $(0, 1)$. [50] Lightstone shows how to associate to each number a sequence of digits,

indexed by the hypernatural numbers. While he does not directly discuss $0.999...$, he shows the real number $1/3$ is represented by $0.333...;...333...$ which is a consequence of the transfer principle. As a consequence the number $0.999...;...999... = 1$. With this type of decimal representation, not every expansion represents a number. In particular " $0.333...;...000...$ " and " $0.999...;...000...$ " do not correspond to any number.

The standard definition of the number $0.999...$ is the limit of the sequence $0.9, 0.99, 0.999, \dots$. A different definition considers the equivalence class $[(0.9, 0.99, 0.999, \dots)]$ of this sequence in the ultrapower construction, which corresponds to a number that is infinitesimally smaller than 1. More generally, the hyperreal number $u_H = 0.999...;...999000...$, with last digit 9 at infinite hypernatural rank H , satisfies a strict inequality $u_H < 1$. Accordingly, Karin Katz and Mikhail Katz have proposed an alternative interpretation of " $0.999...$ ":

[51]

All such interpretations of " $0.999...$ " are infinitely close to 1. Ian Stewart characterizes this interpretation as an "entirely reasonable" way to rigorously justify the intuition that "there's a little bit missing" from 1 in $0.999...$ [52] Along with Katz & Katz, Robert Ely also questions the assumption that students' ideas about $0.999... < 1$ are erroneous intuitions about the real numbers, interpreting them rather as nonstandard intuitions that could be valuable in the learning of calculus.[53][54] Jose Benardete in his book *Infinity: An essay in metaphysics* argues that some natural pre-mathematical intuitions cannot be expressed if one is limited to an overly restrictive number system:

The intelligibility of the continuum has been found to require that the domain of real numbers be enlarged to include infinitesimals. This enlarged domain may be styled the domain of continuum numbers. It will now be evident that $0.999...$ does not equal 1 but falls infinitesimally short of it. I think that $0.999...$ should indeed be admitted as a number ... though not as a real number.[55]

[edit] Hackenbush

Combinatorial game theory provides alternative reals as well, with infinite Blue-Red Hackenbush as one particularly relevant example. In 1974, Elwyn Berlekamp described a correspondence between Hackenbush strings and binary expansions of real numbers, motivated by the idea of data compression. For example, the value of the Hackenbush string $LRRLRLRL...$ is $0.0101012... = 1/3$. However, the value of $LRLLL...$ (corresponding to $0.111..._2$) is infinitesimally less than 1. The difference between the two is the surreal number $1/\aleph_1$, where \aleph_1 is the first infinite ordinal; the relevant game is $LRRRR...$ or $0.000..._2$. [56]

This is in fact true of the binary expansions of many rational numbers, where the values of the numbers are equal but the corresponding binary tree paths are

different. For example, $0.10111\dots_2 = 0.11000\dots_2$, which are both equal to $\frac{3}{4}$, but the first representation corresponds to the binary tree path LRLRRR... while the second corresponds to the different path LRRLLL....

[edit] Revisiting subtraction

Another manner in which the proofs might be undermined is if $1 - 0.999\dots$ simply does not exist, because subtraction is not always possible. Mathematical structures with an addition operation but not a subtraction operation include commutative semigroups, commutative monoids and semirings. Richman considers two such systems, designed so that $0.999\dots < 1$.

First, Richman defines a nonnegative decimal number to be a literal decimal expansion. He defines the lexicographical order and an addition operation, noting that $0.999\dots < 1$ simply because $0 < 1$ in the ones place, but for any nonterminating x , one has $0.999\dots + x = 1 + x$. So one peculiarity of the decimal numbers is that addition cannot always be cancelled; another is that no decimal number corresponds to $\frac{1}{3}$. After defining multiplication, the decimal numbers form a positive, totally ordered, commutative semiring.[57]

In the process of defining multiplication, Richman also defines another system he calls "cut D", which is the set of Dedekind cuts of decimal fractions. Ordinarily this definition leads to the real numbers, but for a decimal fraction d he allows both the cut $(\{x \mid x < d\})$ and the "principal cut" $(\{x \mid x \leq d\})$. The result is that the real numbers are "living uneasily together with" the decimal fractions. Again $0.999\dots < 1$. There are no positive infinitesimals in cut D, but there is "a sort of negative infinitesimal," 0^- , which has no decimal expansion. He concludes that $0.999\dots = 1 + 0^-$, while the equation " $0.999\dots + x = 1$ " has no solution.[58]

[edit] p-adic numbers

Main article: p-adic number

When asked about $0.999\dots$, novices often believe there should be a "final 9," believing $1 - 0.999\dots$ to be a positive number which they write as " $0.000\dots 1$ ". Whether or not that makes sense, the intuitive goal is clear: adding a 1 to the last 9 in $0.999\dots$ would carry all the 9s into 0s and leave a 1 in the ones place. Among other reasons, this idea fails because there is no "last 9" in $0.999\dots$ [59] However, there is a system that contains an infinite string of 9s including a last 9.

The p-adic numbers are an alternative number system of interest in number theory. Like the real numbers, the p-adic numbers can be built from the rational numbers via Cauchy sequences; the construction uses a different metric in which 0 is closer to p , and much closer to p^n , than it is to 1. The p-adic numbers form a field for prime p and a ring for other p , including 10. So arithmetic can be performed in the p-adics, and there are no infinitesimals.

In the 10-adic numbers, the analogues of decimal expansions run to the left. The 10-adic expansion $\dots 999$ does have a last 9, and it does not have a first 9. One can add 1 to the ones place, and it leaves behind only 0s after carrying through: $1 + \dots 999 = \dots 000 = 0$, and so $\dots 999 = -1$. [60] Another derivation uses a geometric series. The infinite series implied by " $\dots 999$ " does not converge in the real numbers, but it converges in the 10-adics, and so one can re-use the familiar formula:

[61]

(Compare with the series above.) A third derivation was invented by a seventh-grader who was doubtful over her teacher's limiting argument that $0.999\dots = 1$ but was inspired to take the multiply-by-10 proof above in the opposite direction: if $x = \dots 999$ then $10x = \dots 990$, so $10x = x - 9$, hence $x = -1$ again.[60]

As a final extension, since $0.999\dots = 1$ (in the reals) and $\dots 999 = -1$ (in the 10-adics), then by "blind faith and unabashed juggling of symbols"[62] one may add the two equations and arrive at $\dots 999.999\dots = 0$. This equation does not make sense either as a 10-adic expansion or an ordinary decimal expansion, but it turns out to be meaningful and true if one develops a theory of "double-decimals" with eventually repeating left ends to represent a familiar system: the real numbers.[63]

[edit] Related questions

Zeno's paradoxes, particularly the paradox of the runner, are reminiscent of the apparent paradox that $0.999\dots$ and 1 are equal. The runner paradox can be mathematically modelled and then, like $0.999\dots$, resolved using a geometric series. However, it is not clear if this mathematical treatment addresses the underlying metaphysical issues Zeno was exploring.[64]

Division by zero occurs in some popular discussions of $0.999\dots$, and it also stirs up contention. While most authors choose to define $0.999\dots$, almost all modern treatments leave division by zero undefined, as it can be given no meaning in the standard real numbers. However, division by zero is defined in some other systems, such as complex analysis, where the extended complex plane, i.e. the Riemann sphere, has a "point at infinity". Here, it makes sense to define $1/0$ to be infinity;[65] and, in fact, the results are profound and applicable to many problems in engineering and physics. Some prominent mathematicians argued for such a definition long before either number system was developed.[66]

Negative zero is another redundant feature of many ways of writing numbers. In number systems, such as the real numbers, where 0 denotes the additive identity and is neither positive nor negative, the usual interpretation of $-\hat{0}$ is that it should denote the additive inverse of 0 , which forces $-\hat{0} = \hat{0}$. [67] Nonetheless, some scientific applications use separate positive and negative zeroes, as do some computing binary number systems (for example integers stored in the sign and magnitude or ones' complement formats, or floating point numbers as specified by the IEEE floating-point standard).[68][69]

[edit] See also

- ^ This argument is found in Peressini and Peressini p. 186
- ^ Byers pp. 39–41
- ^ Richman p. 396
- ^ Rudin p. 61, Theorem 3.26; J. Stewart p. 706
- ^ Euler p. 170
- ^ Grattan-Guinness p. 69; Bonnycastle p. 177
- ^ For example, J. Stewart p. 706, Rudin p. 61, Protter and Morrey p. 213, Pugh p. 180, J.B. Conway p. 31
- ^ The limit follows, for example, from Rudin p. 57, Theorem 3.20e. For a more direct approach, see also Finney, Weir, Giordano (2001) Thomas' Calculus: Early Transcendentals 10ed, Addison-Wesley, New York. Section 8.1, example 2(a), example 6(b).
- ^ Davies p. 175; Smith and Harrington p. 115
- ^ Beals p. 22; I. Stewart p. 34
- ^ Bartle and Sherbert pp. 60–62; Pedrick p. 29; Sohrab p. 46
- ^ Apostol pp. 9, 11–12; Beals p. 22; Rosenlicht p. 27
- ^ Apostol p. 12
- ^ The historical synthesis is claimed by Griffiths and Hilton (p.xiv) in 1970 and again by Pugh (p. 10) in 2001; both actually prefer Dedekind cuts to axioms. For the use of cuts in textbooks, see Pugh p. 17 or Rudin p. 17. For viewpoints on logic, Pugh p. 10, Rudin p.ix, or Munkres p. 30
- ^ Enderton (p. 113) qualifies this description: "The idea behind Dedekind cuts is that a real number x can be named by giving an infinite set of rationals, namely all the rationals less than x . We will in effect define x to be the set of rationals smaller than x . To avoid circularity in the definition, we must be able to characterize the sets of rationals obtainable in this way..."
- ^ Rudin pp. 17–20, Richman p. 399, or Enderton p. 119. To be precise, Rudin, Richman, and Enderton call this cut 1^* , 1^+ , and $1R$, respectively; all three identify it with the traditional real number 1 . Note that what Rudin and Enderton call a Dedekind cut, Richman calls a "nonprincipal Dedekind cut".
- ^ Richman p. 399
- ^ a b J J O'Connor and E F Robertson (October 2005). "History topic: The real numbers: Stevin to Hilbert". MacTutor History of Mathematics. Archived from the original on 2007-09-29.

http://www-gap.dcs.st-and.ac.uk/~history/PrintHT/Real_numbers_2.html. Retrieved 2006-08-30.

^ Richman

^ Richman pp. 398â ^399

^ Griffiths & Hilton Â§24.2 "Sequences" p. 386

^ Griffiths & Hilton pp. 388, 393

^ Griffiths & Hilton p. 395

^ Griffiths & Hilton pp.viii, 395

^ PetkovÅiek p. 408

^ Protter and Morrey p. 503; Bartle and Sherbert p. 61

^ Komornik and Loreti p. 636

^ Kempner p. 611; PetkovÅiek p. 409

^ PetkovÅiek pp. 410â ^411

^ Leavitt 1984 p. 301

^ Lewittes pp. 1â ^3; Leavitt 1967 pp. 669, 673; Shrader-Frechette pp. 96â ^98

^ Pugh p. 97; Alligood, Sauer, and Yorke pp. 150â ^152. Protter and Morrey (p. 507) and Pedrick (p. 29) assign this description as an exercise.

^ Maor (p. 60) and Mankiewicz (p. 151) review the former method; Mankiewicz attributes it to Cantor, but the primary source is unclear. Munkres (p. 50) mentions the latter method.

^ Rudin p. 50, Pugh p. 98

^ Bunch p. 119; Tall and Schwarzenberger p. 6. The last suggestion is due to Burrell (p. 28): "Perhaps the most reassuring of all numbers is $1\hat{A}$... So it is particularly unsettling when someone tries to pass off $0.9\sim$ as 1."

^ Tall and Schwarzenberger pp. 6â ^7; Tall 2000 p. 221

^ Tall and Schwarzenberger p. 6; Tall 2000 p. 221

^ Tall 2000 p. 221

^ Tall 1976 pp. 10â ^14

^ Pinto and Tall p. 5, Edwards and Ward pp. 416â ^417

^ Mazur pp. 137â ^141

^ Dubinsky et al. 261â ^262

^ As observed by Richman (p. 396). Hans de Vreught (1994). "sci.math FAQ: Why is $0.9999\ldots = 1$?". Archived from the original on 2007-09-29.

<http://www.faqs.org/faqs/sci-math-faq/specialnumbers/0.999eq1/>. Retrieved 2006-06-29.

^ Cecil Adams (2003-07-11). "An infinite question: Why doesn't $.999\sim = 1$?. The Straight Dope. Chicago Reader. Archived from the original on 15 August 2006.

<http://www.straightdope.com/columns/030711.html>. Retrieved 2006-09-06.

^ "Blizzard Entertainment Announces $.999\sim$ (Repeating) = 1". Press Release.

Blizzard Entertainment. 2004-04-01. Archived from the original on 4 November 2009.

<http://web.archive.org/web/20091104222830/http://us.blizzard.com/en-us/company/press/pressreleases.html?040401>. Retrieved 2009-11-16.

^ Renteln and Dundes, p. 27

^ Gowers p. 60

^ Berz 439â ^442

^ For a full treatment of non-standard numbers see for example Robinson's Non-standard Analysis.

^ Lightstone pp. 245â ^247

^ Katz & Katz 2010

^ Stewart 2009, p. 175; the full discussion of $0.999\ldots$ is spread through pp. 172â ^175.

^ Katz & Katz (2010b)

^ R. Ely (2010)

^ Benardete, JosÃ© Amado (1964). Infinity: An essay in metaphysics. Clarendon Press. p.Â 279. <http://books.google.com/?id=wMgtAAAAMAAJ>. Retrieved 27 November 2011.

^ Berlekamp, Conway, and Guy (pp. 79â ^80, 307â ^311) discuss 1 and $1/3$ and touch on $1/\hat{I}$. The game for $0.111\ldots 2$ follows directly from Berlekamp's Rule.

^ Richman pp. 397â ^399

^ Richman pp. 398â ^400. Rudin (p. 23) assigns this alternative construction (but over the rationals) as the last exercise of Chapter 1.
 ^ Gardiner p. 98; Gowers p. 60
 ^ a b Fjelstad p. 11
 ^ Fjelstad pp. 14â ^15
 ^ DeSua p. 901
 ^ DeSua pp. 902â ^903
 ^ Wallace p. 51, Maor p. 17
 ^ See, for example, J.B. Conway's treatment of Möbius transformations, pp. 47â ^57
 ^ Maor p. 54
 ^ Munkres p. 34, Exercise 1(c)
 ^ Kroemer, Herbert; Kittel, Charles (1980). Thermal Physics (2e ed.). W. H. Freeman. p. 462. ISBN 0-7167-1088-9.
 ^ "Floating point types". MSDN C# Language Specification. Archived from the original on 24 August 2006.
http://web.archive.org/web/20060824085452/http://msdn.microsoft.com/library/en-us/csspec/html/vclrfcsharp-spec_4_1_6.asp. Retrieved 2006-08-29.

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Alligood, K. T.; Sauer, T. D.; Yorke, J. A. (1996). "4.1 Cantor Sets". *Chaos: An introduction to dynamical systems*. Springer. ISBN 0-387-94677-2.
 This introductory textbook on dynamical systems is aimed at undergraduate and beginning graduate students. (p. ix)
 Apostol, Tom M. (1974). *Mathematical analysis* (2e ed.). Addison-Wesley. ISBN 0-201-00288-4.
 A transition from calculus to advanced analysis, *Mathematical analysis* is intended to be "honest, rigorous, up to date, and, at the same time, not too pedantic." (pref.) Apostol's development of the real numbers uses the least upper bound axiom and introduces infinite decimals two pages later. (pp. 9â ^11)
 Bartle, R. G.; Sherbert, D. R. (1982). *Introduction to real analysis*. Wiley. ISBN 0-471-05944-7.
 This text aims to be "an accessible, reasonably paced textbook that deals with the fundamental concepts and techniques of real analysis." Its development of the real numbers relies on the supremum axiom. (pp. viiâ ^viii)
 Beals, Richard (2004). *Analysis*. Cambridge UP. ISBN 0-521-60047-2.
 Berlekamp, E. R.; Conway, J. H.; Guy, R. K. (1982). *Winning Ways for your Mathematical Plays*. Academic Press. ISBN 0-12-091101-9.
 Berz, Martin (1992). "Automatic differentiation as nonarchimedean analysis". *Computer Arithmetic and Enclosure Methods*. Elsevier. pp. 439â ^450. CiteSeerX: 10.1.1.31.3019.
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 Bunch, Bryan H. (1982). *Mathematical fallacies and paradoxes*. Van Nostrand Reinhold. ISBN 0-442-24905-5.
 This book presents an analysis of paradoxes and fallacies as a tool for exploring its central topic, "the rather tenuous relationship between mathematical reality and physical reality". It assumes first-year high-school algebra; further mathematics is developed in the book, including geometric series in Chapter 2. Although 0.999... is not one of the paradoxes to be fully treated, it is briefly mentioned during a development of Cantor's diagonal method. (pp. ix-xi, 119)
 Burrell, Brian (1998). *Merriam-Webster's Guide to Everyday Math: A Home and Business Reference*. Merriam-Webster. ISBN 0-87779-621-1.
 Byers, William (2007). *How Mathematicians Think: Using Ambiguity, Contradiction, and Paradox to Create Mathematics*. Princeton UP. ISBN 0-691-12738-7.
 Conway, John B. (1978) [1973]. *Functions of one complex variable I* (2e ed.). Springer-Verlag. ISBN 0-387-90328-3.
 This text assumes "a stiff course in basic calculus" as a prerequisite; its

stated principles are to present complex analysis as "An Introduction to Mathematics" and to state the material clearly and precisely. (p. vii)

Davies, Charles (1846). *The University Arithmetic: Embracing the Science of Numbers, and Their Numerous Applications*. A.S. Barnes.
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DeSua, Frank C. (November 1960). "A system isomorphic to the reals". *The American Mathematical Monthly* 67 (9): 900â ^903. doi:10.2307/2309468. JSTORÂ 2309468.

Dubinsky, Ed; Weller, Kirk; McDonald, Michael; Brown, Anne (2005). "Some historical issues and paradoxes regarding the concept of infinity: an APOS analysis: part 2". *Educational Studies in Mathematics* 60 (2): 253â ^266. doi:10.1007/s10649-005-0473-0.

Edwards, Barbara; Ward, Michael (May 2004). "Surprises from mathematics education research: Student (mis)use of mathematical definitions". *The American Mathematical Monthly* 111 (5): 411â ^425. doi:10.2307/4145268. JSTORÂ 4145268. Archived from the original on 22 July 2011.
<http://web.archive.org/web/20110722153906/http://www.wou.edu/~wardm/FromMonthlyMay2004.pdf>. Retrieved 4 July 2011.

Enderton, Herbert B. (1977). *Elements of set theory*. Elsevier. ISBNÂ 0-12-238440-7.

An introductory undergraduate textbook in set theory that "presupposes no specific background". It is written to accommodate a course focusing on axiomatic set theory or on the construction of number systems; the axiomatic material is marked such that it may be de-emphasized. (pp. xiâ ^xii)

Euler, Leonhard (1822) [1770]. John Hewlett and Francis Horner, English translators.. ed. *Elements of Algebra* (3rd English ed.). Orme Longman. ISBNÂ 0-387-96014-7. http://books.google.com/?id=X8yv0sj4_lYC&pg=PA170. Retrieved 4 July 2011.

Fjelstad, Paul (January 1995). "The repeating integer paradox". *The College Mathematics Journal* 26 (1): 11â ^15. doi:10.2307/2687285. JSTORÂ 2687285.

Gardiner, Anthony (2003) [1982]. *Understanding Infinity: The Mathematics of Infinite Processes*. Dover. ISBNÂ 0-486-42538-X.

Gowers, Timothy (2002). *Mathematics: A Very Short Introduction*. Oxford UP. ISBNÂ 0-19-285361-9.

Grattan-Guinness, Ivor (1970). *The development of the foundations of mathematical analysis from Euler to Riemann*. MIT Press. ISBNÂ 0-262-07034-0.

Griffiths, H. B.; Hilton, P. J. (1970). *A Comprehensive Textbook of Classical Mathematics: A Contemporary Interpretation*. London: Van Nostrand Reinhold. ISBNÂ 0-442-02863-6. LCCÂ QA37.2Â G75.

This book grew out of a course for Birmingham-area grammar school mathematics teachers. The course was intended to convey a university-level perspective on school mathematics, and the book is aimed at students "who have reached roughly the level of completing one year of specialist mathematical study at a university". The real numbers are constructed in Chapter 24, "perhaps the most difficult chapter in the entire book", although the authors ascribe much of the difficulty to their use of ideal theory, which is not reproduced here. (pp. vii, xiv)

Katz, K.; Katz, M. (2010a). "When is .999... less than 1?". *The Montana Mathematics Enthusiast* 7 (1): 3â ^30. Archived from the original on 20 July 2011.
<http://www.math.umont.edu/TMME/vol7no1/>. Retrieved 4 July 2011.

Kempner, A. J. (December 1936). "Anormal Systems of Numeration". *The American Mathematical Monthly* 43 (10): 610â ^617. doi:10.2307/2300532. JSTORÂ 2300532.

Komornik, Vilmos; Loreti, Paola (1998). "Unique Developments in Non-Integer Bases". *The American Mathematical Monthly* 105 (7): 636â ^639. doi:10.2307/2589246. JSTORÂ 2589246.

Leavitt, W. G. (1967). "A Theorem on Repeating Decimals". *The American Mathematical Monthly* 74 (6): 669â ^673. doi:10.2307/2314251. JSTORÂ 2314251.

Leavitt, W. G. (September 1984). "Repeating Decimals". *The College Mathematics Journal* 15 (4): 299â ^308. doi:10.2307/2686394. JSTORÂ 2686394.

Lightstone, A. H. (March 1972). "Infinitesimals". *The American Mathematical Monthly* 79 (3): 242âˆ²251. doi:10.2307/2316619. JSTORâˆ² 2316619.

Mankiewicz, Richard (2000). *The story of mathematics*. Cassell. ISBNâˆ² 0-304-35473-2.

Mankiewicz seeks to represent "the history of mathematics in an accessible style" by combining visual and qualitative aspects of mathematics, mathematicians' writings, and historical sketches. (p.âˆ² 8)

Maor, Eli (1987). *To infinity and beyond: a cultural history of the infinite*. Birkh user. ISBNâˆ² 3-7643-3325-1.

A topical rather than chronological review of infinity, this book is "intended for the general reader" but "told from the point of view of a mathematician". On the dilemma of rigor versus readable language, Maor comments, "I hope I have succeeded in properly addressing this problem." (pp. x-xiii)

Mazur, Joseph (2005). *Euclid in the Rainforest: Discovering Universal Truths in Logic and Math*. Pearson: Pi Press. ISBNâˆ² 0-13-147994-6.

Munkres, James R. (2000) [1975]. *Topology* (2e ed.). Prentice-Hall. ISBNâˆ² 0-13-181629-2.

Intended as an introduction "at the senior or first-year graduate level" with no formal prerequisites: "I do not even assume the reader knows much set theory." (p. xi) Munkres' treatment of the reals is axiomatic; he claims of bare-hands constructions, "This way of approaching the subject takes a good deal of time and effort and is of greater logical than mathematical interest." (p.âˆ² 30)

N  ez, Rafael (2006). "Do Real Numbers Really Move? Language, Thought, and Gesture: The Embodied Cognitive Foundations of Mathematics". *18 Unconventional Essays on the Nature of Mathematics*. Springer. pp.âˆ² 160âˆ² 181. ISBN 978-0-387-25717-4. Archived from the original on 18 July 2011. <http://web.archive.org/web/20110718014351/http://www.cogsci.ucsd.edu/~nunez/web/publications.html>. Retrieved 4 July 2011.

Pedrick, George (1994). *A First Course in Analysis*. Springer. ISBNâˆ² 0-387-94108-8.

Peressini, Anthony; Peressini, Dominic (2007). "Philosophy of Mathematics and Mathematics Education". In Bart van Kerkhove, Jean Paul van Bendegem. *Perspectives on Mathematical Practices. Logic, Epistemology, and the Unity of Science*. 5. Springer. ISBNâˆ² 978-1-4020-5033-6.

Petkov ek, Marko (May 1990). "Ambiguous Numbers are Dense". *American Mathematical Monthly* 97 (5): 408âˆ² 411. doi:10.2307/2324393. JSTORâˆ² 2324393.

Pinto, M rcia; Tall, David (2001). "Following students' development in a traditional university analysis course". *PME25*. pp.âˆ² v4: 57âˆ² 64. Archived from the original on 30 May 2009. <http://web.archive.org/web/20090530043127/http://www.warwick.ac.uk/staff/David.Tall/pdfs/dot2001j-pme25-pinto-tall.pdf>. Retrieved 2009-05-03.

Protter, M. H.; Morrey, C. B. (1991). *A first course in real analysis* (2e ed.). Springer. ISBNâˆ² 0-387-97437-7.

This book aims to "present a theoretical foundation of analysis that is suitable for students who have completed a standard course in calculus." (p. vii) At the end of Chapter 2, the authors assume as an axiom for the real numbers that bounded, nondecreasing sequences converge, later proving the nested intervals theorem and the least upper bound property. (pp.âˆ² 56âˆ² 64) Decimal expansions appear in Appendix 3, "Expansions of real numbers in any base". (pp.âˆ² 503âˆ² 507)

Pugh, Charles Chapman (2001). *Real mathematical analysis*. Springer-Verlag. ISBNâˆ² 0-387-95297-7.

While assuming familiarity with the rational numbers, Pugh introduces Dedekind cuts as soon as possible, saying of the axiomatic treatment, "This is something of a fraud, considering that the entire structure of analysis is built on the real number system." (p.âˆ² 10) After proving the least upper bound property and some allied facts, cuts are not used in the rest of the book.

Renteln, Paul; Dundes, Allan (January 2005). "Foolproof: A Sampling of Mathematical Folk Humor". *Notices of the AMS* 52 (1): 24âˆ² 34. Archived from the

original on 25 February 2009.

<http://web.archive.org/web/20090225124532/http://www.ams.org/notices/200501/featuring-dundee.pdf>. Retrieved 2009-05-03.

Richman, Fred (December 1999). "Is $0.999\ldots = 1$?" *Mathematics Magazine* 72 (5): 396-400. doi:10.2307/2690798. JSTOR 2690798. Free HTML preprint: Richman, Fred (1999-06-08). "Is $0.999\ldots = 1$?" Archived from the original on 2 September 2006. <http://www.math.fau.edu/Richman/HTML/999.htm>. Retrieved 2006-08-23. Note: the journal article contains material and wording not found in the preprint.

Robinson, Abraham (1996). *Non-standard analysis* (Revised ed.). Princeton University Press. ISBN 0-691-04490-2.

Rosenlicht, Maxwell (1985). *Introduction to Analysis*. Dover. ISBN 0-486-65038-3. This book gives a "careful rigorous" introduction to real analysis. It gives the axioms of the real numbers and then constructs them (pp. 27-31) as infinite decimals with $0.999\ldots = 1$ as part of the definition.

Rudin, Walter (1976) [1953]. *Principles of mathematical analysis* (3e ed.). McGraw-Hill. ISBN 0-07-054235-X.

A textbook for an advanced undergraduate course. "Experience has convinced me that it is pedagogically unsound (though logically correct) to start off with the construction of the real numbers from the rational ones. At the beginning, most students simply fail to appreciate the need for doing this. Accordingly, the real number system is introduced as an ordered field with the least-upper-bound property, and a few interesting applications of this property are quickly made. However, Dedekind's construction is not omitted. It is now in an Appendix to Chapter 1, where it may be studied and enjoyed whenever the time is ripe." (p. ix)

Shrader-Frechette, Maurice (March 1978). "Complementary Rational Numbers". *Mathematics Magazine* 51 (2): 90-98. doi:10.2307/2690144. JSTOR 2690144.

Smith, Charles; Harrington, Charles (1895). *Arithmetic for Schools*. Macmillan. ISBN 0-665-54808-7.

<http://books.google.com/books?vid=LCCN02029670&pg=PA115>. Retrieved 4 July 2011.

Sohrab, Houshang (2003). *Basic Real Analysis*. Birkhäuser. ISBN 0-8176-4211-0.

Starbird, M.; Starbird, T. (March 1992). "Required Redundancy in the Representation of Reals". *Proceedings of the American Mathematical Society* (AMS) 114 (3): 769-774. doi:10.1090/S0002-9939-1992-1086343-5. JSTOR 2159403.

Stewart, Ian (1977). *The Foundations of Mathematics*. Oxford UP. ISBN 0-19-853165-6.

Stewart, Ian (2009). *Professor Stewart's Hoard of Mathematical Treasures*. Profile Books. ISBN 978-1-84668-292-6.

Stewart, James (1999). *Calculus: Early transcendentals* (4e ed.). Brooks/Cole. ISBN 0-534-36298-2.

This book aims to "assist students in discovering calculus" and "to foster conceptual understanding". (p. v) It omits proofs of the foundations of calculus.

Tall, D. O.; Schwarzenberger, R. L. E. (1978). "Conflicts in the Learning of Real Numbers and Limits". *Mathematics Teaching* 82: 44-49. Archived from the original on 30 May 2009.

<http://web.archive.org/web/20090530043040/http://www.warwick.ac.uk/staff/David.Tall/pdfs/dot1978c-with-rolph.pdf>. Retrieved 2009-05-03.

Tall, David (1976/7). "Conflicts and Catastrophes in the Learning of Mathematics". *Mathematical Education for Teaching* 2 (4): 2-18. Archived from the original on 26 March 2009.

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Hilbert, David (1902). *Mathematical Grundlagen der Physik* (1st ed.). Leipzig: Verlag von S. Hirzel.
 Wallace, David Foster (2003). *Everything and more: a compact history of infinity*. Norton. ISBN 0-393-00338-8.

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 Burn, Bob (March 1997). "81.15 A Case of Conflict". *The Mathematical Gazette* 81 (490): 109–112. doi:10.2307/3618786. JSTOR 3618786.
 Calvert, J. B.; Tuttle, E. R.; Martin, Michael S.; Warren, Peter (February 1981). "The Age of Newton: An Intensive Interdisciplinary Course". *The History Teacher* 14 (2): 167–190. doi:10.2307/493261. JSTOR 493261.
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 Eisenmann, Petr (2008). "Why is it not true that $0.999\dots < 1$?". *The Teaching of Mathematics* 11 (1): 35–40.
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 Ely, Robert (2010). "Nonstandard student conceptions about infinitesimals". *Journal for Research in Mathematics Education* 41 (2): 117–146.
 This article is a field study involving a student who developed a Leibnizian-style theory of infinitesimals to help her understand calculus, and in particular to account for $0.999\dots$ falling short of 1 by an infinitesimal $0.000\dots 1$.
 Ferrini-Mundy, J.; Graham, K. (1994). *Research in calculus learning: Understanding of limits, derivatives and integrals*. In Kaput, J.; Dubinsky, E.. "Research issues in undergraduate mathematics learning". *MAA Notes* 33: 31–45.
 Lewittes, Joseph (2006). "Midy's Theorem for Periodic Decimals". arXiv:math.NT/0605182 [math.NT].
 Katz, Karin Usadi; Katz, Mikhail G. (2010b). "Zooming in on infinitesimal $1 - 0.9\dots$ in a post-triumvirate era". *Educational Studies in Mathematics* 74 (3): 259. arXiv:1003.1501. doi:10.1007/s10649-010-9239-4.
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obstacles related to limits". Educational Studies in Mathematics 18 (4): 371â ^396. doi:10.1007/BF00240986. JSTORÂ 3482354.
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 Tall, David O. (2009). "Dynamic mathematics and the blending of knowledge structures in the calculus". ZDM Mathematics Education 41 (4): 481â ^492. doi:10.1007/s11858-009-0192-6.
 Tall, David O. (May 1981). "Intuitions of infinity". Mathematics in School 10 (3): 30â ^33. JSTORÂ 30214290.

[edit] External links

Isaac Shelby

1st Governor of Kentucky

In office

June 4, 1792Â â ^ June 1, 1796

Lieutenant

No such office

Preceded by

(none)

Succeeded by

James Garrard

5th Governor of Kentucky

In office

August 24, 1812Â â ^ September 5, 1816

Lieutenant

Richard Hickman

Preceded by

Charles Scott

Succeeded by

George Madison

Personal details

Born

(1750-12-11)December 11, 1750Hagerstown, Maryland

Died

July 18, 1826(1826-07-18) (agedÂ 75)Lincoln County, Kentucky

Political party

Democratic-Republican

Spouse(s)

Susannah Hart

Relations

Father-in-law of Ephraim McDowell and Charles Stewart Todd

Residence

Traveler's Rest

Profession

Soldier, Farmer

Religion

Presbyterian

Signature

Military service

Nickname(s)

"Old King's Mountain"

Allegiance

Thirteen Colonies, United States

Rank

Major general

Commands

Battle of King's Mountain

Battles/wars

Lord Dunmore's War, Revolutionary War, War of 1812

Awards

Congressional Gold Medal, Thanks of Congress

Isaac Shelby (December 11, 1750 – July 18, 1826) was the first and fifth Governor of the U.S. state of Kentucky and served in the state legislatures of Virginia and North Carolina. He was also a soldier in Lord Dunmore's War, the Revolutionary War, and the War of 1812. While governor, he personally led the Kentucky militia in the Battle of the Thames, an action that was rewarded with a Congressional Gold Medal. Counties in nine states, and several cities and military bases, have been named in his honor. His fondness for John Dickinson's The Liberty Song is believed to be the reason Kentucky adopted the state motto "United we stand, divided we fall".

Shelby's military service began when he served as second-in-command to his father at the Battle of Point Pleasant, the only major battle of Lord Dunmore's War. He gained the reputation of an expert woodsman and surveyor, and spent the early part of the Revolutionary War gathering supplies for the Continental Army. Later in the war, he and John Sevier led expeditions over the Appalachian Mountains against the British forces in North Carolina. He played a pivotal role in the British defeat at the Battle of King's Mountain. For his service, he was presented with a ceremonial sword and a pair of pistols by the North Carolina legislature, and the nickname "Old King's Mountain" followed him the rest of his life.

Following the war, Shelby relocated to Kentucky on lands awarded to him for his military service and became involved in Kentucky's transition from a county of Virginia to an independent state. His heroism made him popular with the citizens of the state, and the state electoral college unanimously elected him governor in 1792. He secured the state from Indian attacks and organized its first government. He leveraged the Citizen Genet affair to convince the Washington administration to make an agreement with the Spanish for free trade on the Mississippi River.

At the end of his gubernatorial term, Shelby retired from public life, but he was called back into politics by the impending War of 1812. Kentuckians urged Shelby to run for governor again and lead them through the anticipated conflict. He was elected easily, and at the request of General William Henry Harrison, commanded troops from Kentucky at the Battle of the Thames. At the conclusion of the war, he declined President James Monroe's offer to become Secretary of War. In his last act of public service, he and Andrew Jackson acted as commissioners to negotiate the Jackson Purchase from the Chickasaw Indian tribe. Shelby died at his estate in Lincoln County, Kentucky, on July 18, 1826.

[edit] Early life

Isaac Shelby was born in the Province of Maryland on December 11, 1750, near Hagerstown in Frederick (now Washington) County.[1][2] He was the third child and second son of Evan and Letitia (Cox) Shelby, who immigrated from Tregaron, Wales, in 1735.[3] Though the family had historically been loyal to the Church of England, they became Presbyterians after coming to British America; this was the denomination Isaac Shelby embraced during his life.[3]

Shelby was educated at the local schools in his native colony.[4] He worked on his father's plantation, and occasionally found work as a surveyor.[2] At age eighteen, he was appointed deputy sheriff of Frederick County.[3][5] Shelby's father lost a great deal of money when Pontiac's Rebellion disrupted his lucrative fur trade business, and two years later, the business' records were destroyed in a house fire.[6] Consequently in December 1770, the family moved to the area near Bristol, Tennessee, where they built a fort and a trading post.[7] Here, Shelby and his father worked for three years herding cattle.[5]

During Lord Dunmore's War, a border conflict between colonists and American Indians, Shelby was commissioned as a lieutenant in the Virginia militia by Colonel William Preston.[8] As second-in-command of his father's Fincastle County company, he participated in the decisive Battle of Point Pleasant on October 10, 1774.[8] The younger Shelby earned commendation for his skill and gallantry in this battle.[2] The victorious militiamen erected Fort Blair on

the site of the battle.[3] They remained stationed there, with Shelby as second-in-command, until July 1775 when Lord Dunmore ordered the fort destroyed, fearing it might become useful to colonial rebels in the growing American Revolution.[3]

[edit] Revolutionary War

After his unit was disbanded, Shelby surveyed for the Transylvania Company, a land company that had purchased much of present-day Kentucky from the Cherokees in a deal that was later invalidated by the government of Virginia.[2] After fulfilling his duties with the Transylvania Company, he rejoined his family in Virginia, but returned to Kentucky the following year to claim and improve land there for himself.[2] While there, he fell ill, and went home to recover in July 1776.[9] Back in Virginia, fighting in the American Revolutionary War was underway, and Shelby found a commission from the Virginia Committee of Safety appointing him captain of a company of Minutemen.[9] In 1777, Virginia governor Patrick Henry appointed Shelby to a position securing provisions for the army on the frontier.[9] He served a similar role for units in the Continental Army in 1778 and 1779.[9] With his own money, Shelby purchased provisions for John Sevier's 1779 expedition against the Chickamauga, a band of Cherokees who were resisting colonial expansion.[5]

Shelby was elected to represent Washington County in the Virginia House of Delegates in 1779.[9] Later that year, he was commissioned a major by Governor Thomas Jefferson and charged with escorting a group of commissioners to establish a frontier boundary line between Virginia and North Carolina.[9] Shortly after his arrival in the region, North Carolina Governor Richard Caswell elevated him to the rank of colonel and made him magistrate of newly-formed Sullivan County.[10]

Shelby was surveying lands in Kentucky in 1780 when he heard of the colonists' defeat at Charleston.[3] He hurried to North Carolina, where he found a request for aid from General Charles McDowell to defend the borders of North Carolina from the British.[3] Shelby assembled three hundred militiamen and joined McDowell at Cherokee Ford in South Carolina.[3] On the morning of July 31, 1780, he surrounded the British stronghold at Thickety Fort on the Pacolet River with 600 men.[11] He immediately demanded a surrender, but the British refused.[12] Shelby brought his men within musket range and again demanded surrender.[12] Though the fort likely would have withstood the attack, the British commander lost his nerve and capitulated.[12] Without firing a shot, Shelby's men captured 94 prisoners.[12]

Following the surrender of Thickety Fort, Shelby joined a band of partisans under Lieutenant Elijah Clarke. This unit was pursued by British Major Patrick Ferguson. On the morning of August 8, 1780, some of Shelby's men were gathering peaches from an orchard when they were surprised by some of Ferguson's men on a reconnaissance mission. Shelby's men quickly readied their arms and drove back the British patrol. Soon, however, the British were reinforced and the colonists fell back. The pattern continued, with one side being reinforced and gaining an advantage, followed by the other. Shelby's men were winning the battle when Ferguson's main force of 1,000 men arrived. Outmanned, they retreated to a nearby hill where British musket fire could not reach them. Now safe, they taunted the British, and Ferguson's force withdrew from the area. Thus ended the Battle of Cedar Springs.[13]

General McDowell then ordered Shelby and Clarke to take Musgrove's Mill, a British encampment on the Enoree River. They rode all night with two hundred men, reaching their location about dawn on August 18, 1780. The colonists had estimated that the enemy force was of comparable size, but an advance scout brought word that there were approximately 500 British soldiers in the camp who were preparing for battle. Shelby's men and horses were too tired for a retreat and they had lost the element of surprise. He ordered his men to construct a breastwork from nearby logs and brush. In half an hour the makeshift fortifications were complete, and twenty-five colonial riders charged the British camp to provoke the attack. The British pursued them back to the main colonial force. Despite being outnumbered, the colonists killed several British

officers and put their army to flight.[14]

[edit] Battle of King's Mountain

Shelby and Clarke elected not to pursue the British fleeing the Battle of Musgrove Mill.[15] Instead, they set their sights on a British fort at Ninety Six, South Carolina, where they were sure they would find Ferguson.[15] However, while en route, Shelby and his men were met with news of General Horatio Gates' defeat at the Battle of Camden.[15] With the backing of General Cornwallis, Ferguson could ride to meet Shelby with his entire force, so Shelby retreated over the Appalachian Mountains into North Carolina.[16]

Following the colonists' retreat, an emboldened Ferguson dispatched a paroled prisoner across the mountains to warn the colonists to cease their opposition or Ferguson would lay waste to the countryside.[17] Angered by this act, Shelby and John Sevier began to plan another raid on the British.[17] Shelby and Sevier raised 240 men each, and were joined by William Campbell with 400 from Washington County, Virginia and Charles McDowell with 160 men from Burke and Rutherford counties in North Carolina.[18] The forces mustered at Sycamore Shoals on September 25, 1780.[18] The troops crossed the difficult terrain of the Blue Ridge Mountains and arrived at McDowell's estate near Morganton, North Carolina, on September 30, 1780.[19] Here, they were joined by Colonel Benjamin Cleveland and Major Joseph Winston with 350 men from Surry and Wilkes counties.[19]

The combined force pursued Ferguson to King's Mountain, where he had fortified himself, declaring that "God Almighty and all the rebels out of hell" could not move him from it.[20] The Battle of Kings Mountain commenced October 7, 1780. Shelby had ordered his men to advance from tree to tree, firing from behind each one; he called this technique "Indian play" because he had seen the Indians use it in his previous battles with them. Ferguson ordered bayonet charges that forced Shelby's men to fall back on three separate occasions, but eventually the colonists dislodged Ferguson's men from their position. Seeing the battle was lost, Ferguson and his key officers attempted a retreat. The colonists were instructed to kill Ferguson. Simultaneous shots by Sevier's men broke both Ferguson's arms, fatally pierced his skull, and knocked him from his mount. Seeing their commander dead, the remaining British soldiers waved white flags of surrender.[21]

King's Mountain was the high point of Shelby's military service, and from that point forward his men dubbed him "Old King's Mountain".[17] The North Carolina legislature passed a vote of thanks to Shelby and Sevier for their service and ordered that each be presented a pair of pistols and a ceremonial sword.[22] (Shelby did not receive these items until he requested them from the legislature in 1813.)[23]

As the colonists and their prisoners began the march from King's Mountain, they learned that nine colonial prisoners had been hanged by the British at Fort Ninety-Six. This was not the first such incident in the region, and the enraged colonists vowed that they would now put a stop to the hangings in the Carolinas. Summoning a jury from their number[^] which was legal because two North Carolina magistrates were present[^] the colonists selected random prisoners and charged them with crimes ranging from theft to arson to murder. By evening, the jury had convicted thirty-six prisoners and sentenced them to hang. After the first nine hangings, however, Shelby ordered them stopped. He never gave a reason for this action, but his order was obeyed nonetheless, and the remaining "convicts" rejoined their fellow prisoners.[24]

The King's Mountain victors and their prisoners returned to McDowell's estate early on the morning of October 10, 1780. From there, the various commanders and their men went their separate ways. Shelby and his men joined General Daniel Morgan at New Providence, South Carolina. While there, Shelby advised Morgan to take Fort Ninety-Six and Augusta because he believed the British forces there were supplying the Cherokee with weapons for their raids against colonial settlers. Morgan agreed to the plan, as did General Horatio Gates, the supreme commander of colonial forces in the region. Assured that his plan would be carried out, Shelby returned home and promised to return the following

spring with 300 men. On his way to Fort Ninety-Six, Morgan was attacked by Banastre Tarleton and gained a decisive victory over him at the Battle of Cowpens. Shelby later lamented the fact that General Nathanael Greene, who relieved Gates only days after Shelby departed for home, claimed the lion's share of the credit for Cowpens when it was Shelby's plan that had put Morgan in the position to begin with.[25]

[edit] Later wartime service and settlement in Kentucky

Upon his return home, Shelby and his father were named commissioners to negotiate a treaty between colonial settlers and the Chickamauga.[26] This service delayed his return to Greene, but in October 1781 he and Sevier led 600 riflemen to join Greene in South Carolina.[27] Greene had thought to use Shelby's and Sevier's men to prevent Cornwallis from returning to Charleston. However, Cornwallis was defeated at the Siege of Yorktown shortly after Shelby and Sevier arrived, and Greene sent them on to join General Francis Marion on the Pee Dee River.[27] On Marion's orders, Shelby and Colonel Hezekiah Maham captured a British fort at Fair Lawn near Moncks Corner on November 27, 1781.[27]

While still in the field, Shelby was elected to the North Carolina General Assembly.[27] He requested and was granted a leave of absence from the Army to attend the legislative session of December 1781.[27] He was re-elected in 1782 and attended the April session of the legislature that year.[27] In early 1783 he was chosen as a commissioner to survey preemption claims of soldiers along the Cumberland River.[28]

Shelby returned to Kentucky in April 1783, settling at Boonesborough.[27] He married Susannah Hart on April 19, 1783; the couple had eleven children.[2] Their eldest daughter, Sarah, married Dr. Ephraim McDowell, and the youngest daughter, Letitia, married future Kentucky secretary of state Charles Stewart Todd.[2][29] On November 1, 1783, the family moved to Lincoln County, near Knob Lick, and occupied land awarded to Shelby for his military service.[17] Shelby was named one of the first trustees of Transylvania Seminary (later Transylvania University) in 1783, and on December 1, 1787, founded the Kentucky Society for the Promotion of Useful Knowledge.[27]

Shelby began working to secure Kentucky's separation from Virginia as early as 1784.[30] That year, he attended a convention to consider leading an expedition against the Indians and separating Kentucky from Virginia.[2] He was a delegate to subsequent conventions in 1787, 1788, and 1789 that worked toward a constitution for Kentucky.[2] During these conventions he helped thwart James Wilkinson's scheme to align Kentucky with the Spanish.[22] In 1791 Shelby, Charles Scott and Benjamin Logan were among those chosen by the Virginia legislature to serve on the Board of War for the district of Kentucky.[9] Shelby was also made High Sheriff on Lincoln County.[9] In 1792 he was a delegate to the final convention that framed the first Kentucky Constitution.[4]

[edit] First term as governor

Under the new constitution, the voters chose electors who then elected the governor and members of the Kentucky Senate.[17] Though there is no indication that Shelby actively sought the office of governor, he was elected unanimously to that post by the electors on May 17, 1791.[17] He took office on June 4, 1792, the day the state was admitted to the Union.[30] Though not actively partisan, he identified with the Democratic-Republicans.[31] Much of his term was devoted to establishing basic laws, military divisions and a tax structure.[30]

One of Shelby's chief concerns was securing federal aid to defend the frontier.[1] Although Kentuckians were engaged in an undeclared war with American Indians north of the Ohio River, Shelby had been ordered by Secretary of War Henry Knox not to conduct offensive military actions against the Indians.[32] Furthermore, he was limited by federal regulations that restricted the service of state militiamen to thirty days, which was too short to be effective.[32] With the meager resources of his fledgling state he was only able to defend the most vulnerable areas from Indian attack.[31] Meanwhile,

Kentuckians suspected that the Indians were being stirred up and supplied by the British.[33]

Shelby appealed to President Washington for help; Washington responded by appointing General "Mad" Anthony Wayne to the area with orders to push the Indians out of the Northwest Territory. Wayne arrived at Fort Washington (present-day Cincinnati, Ohio) in May 1793, but was prevented from taking any immediate action because federal commissioners were still attempting to negotiate a treaty with the Indians. He called for 1,000 volunteer troops from Kentucky, but few heeded the call and Shelby resorted to conscription. By the time the soldiers arrived, winter had set in. He ordered the men to go home and return in the spring.[34]

After a winter filled with Indian attacks, including one which claimed the life of Shelby's younger brother Evan Shelby III, Kentucky militia units won some minor victories over the Indians in early 1794.[35] In spring the response to Wayne's call for troops was more enthusiastic; 1,600 volunteers mustered at Fort Greenville and were hastily trained.[36] By August, 1794, Wayne was on the offensive against the Indians and dealt them a decisive blow at the August 20, 1794 Battle of Fallen Timbers.[36] This victory, and the ensuing Treaty of Greenville, secured the territory, and although Shelby did not agree with some of the restrictions placed upon western settlers by this treaty, he abided by its terms and enforced those that were under his jurisdiction.[37]

Another major concern of the Shelby administration was free navigation on the Mississippi River, which was vital to the state's economic interests. For political reasons the Spanish had closed the port at New Orleans to the Americans. This would have been the natural market for the tobacco, flour and hemp grown by Kentucky farmers; overland routes were too expensive to be profitable. This made it difficult for land speculators to entice immigration to the area to turn a profit on their investments. Many Kentuckians felt the federal government was not acting decisively or quickly enough to remedy this situation.[38]

[edit] Citizen Genêt affair

While Kentuckians despised the British and Spanish, they had a strong affinity for the French. They admired the republican government that had arisen from the French Revolution, and they had not forgotten France's aid during the Revolutionary War. When French Ambassador Edmond-Charles Genêt, popularly known as Citizen Genêt, arrived in the United States in April 1793, George Rogers Clark was already considering an expedition to capture Spanish lands in the west. Genêt's agent, André Michaux, was dispatched to Kentucky to assess the support of Kentuckians toward Clark's expedition. When he gained an audience with Governor Shelby, he did so with letters of introduction from Secretary of State Thomas Jefferson and Kentucky Senator John Brown.[39]

Jefferson had written a separate letter to Shelby warning him against aiding the French schemes and informing him that negotiations were under way with the Spanish regarding trade on the Mississippi. When the letter was sent on August 29, 1793, it was Jefferson's intent that it reach Shelby before Michaux did, but Shelby did not receive it until October 1793. On September 13, 1793, Michaux met with Shelby, but there is no evidence that Shelby agreed to help him. In his response to Jefferson's delayed letter, Shelby assured Jefferson that Kentuckians "possess too just a sense of the obligation they owe the General Government, to embark in any enterprise that would be so injurious to the United States".[40]

In November 1793, Shelby received a letter from another of Genêt's agents, Charles Delpeau. He confided to Shelby that he had been sent to secure supplies for an expedition against Spanish holdings, and inquired whether Shelby had been instructed to arrest individuals associated with such a scheme. Three days later Shelby responded by letter, relating Jefferson's warning against aiding the French. Despite having no evidence that Shelby was party to Genêt's scheme, both Jefferson and Knox felt compelled to warn him a second time. Jefferson provided names and descriptions of the French agents believed to be in Kentucky and encouraged their arrest. Knox went a step further by suggesting Kentucky

would be reimbursed for any costs incurred resisting the French by force, should such action become necessary. General Anthony Wayne informed him that his cavalry was at the state's disposal. Arthur St. Clair, governor of the American Northwest Territory, also admonished Shelby against cooperation with Gen^l. [41]

In his response to Jefferson, Shelby questioned whether he had the legal authority to intervene with force against his constituency and expressed his personal aversion to doing so.

I shall upon all occasions be averse to the exercise of any power which I do not consider myself as being clearly and explicitly invested with, much less would I assume power to exercise it against men whom I consider as friends and brethren, in favor of a man whom I view as an enemy and a tyrant [the king of Spain]. I shall also feel but little inclination to take an active part in punishing or restraining any of my fellow-citizens for a supposed intention only to gratify or remove the fears of the ministers of a foreign prince, who openly withholds from us an invaluable right [navigation of the Mississippi] and who secretly instigates against us a most savage and cruel enemy.

Shelby tempered this lukewarm commitment by assuring Jefferson that "I shall, at all times, hold it my duty to perform whatever may be constitutionally required of me, as Governor of Kentucky, by the President of the United States." [42]

In March 1794, perhaps in response to Shelby's concerns, Congress passed a measure granting the government additional powers in the event of an invasion or insurrection. Jefferson's successor Edmund Randolph, who actually received Shelby's letter, wrote Shelby to inform him of the new powers at his disposal, and informing him that the new regime in France had recalled Gen^l. Two months later Gen^l's agents ceased their operations in Kentucky and the potential crisis was averted. [43] In 1795, President Washington negotiated an agreement with the Spanish that secured the right of Americans to trade on the river. [44]

Having successfully dealt with the major challenges and issues involved in forming a new state government, Shelby left the state safe and financially sound. [44] Kentucky's constitution prevented a governor from serving consecutive terms, so Shelby retired to Traveler's Rest, his Lincoln County estate, at the conclusion of his term in 1796. [9] For the next 15 years he tended to affairs on his farm. [2] He was selected as a presidential elector in six consecutive elections, but these were his only appearances in public life during this period. [45]

[edit] Second term as governor

Gabriel Slaughter was the favorite choice for governor of Kentucky in 1812. Only one impediment to his potential candidacy existed. Growing tensions between the United States, France, and Great Britain threatened to break into open war. With this prospect looming, Isaac Shelby's name began circulating as a possible candidate for governor. Slaughter, who lived near Shelby, visited him and asked whether he would run. Shelby assured him that he had no desire to do so unless a national emergency that required his leadership emerged. Satisfied with this answer, Slaughter began his campaign. [46]

The situation with the European powers grew worse, and on June 18, 1812 the United States declared war on Great Britain, beginning the War of 1812. Cries grew louder for Shelby to return as Kentucky's chief executive. On July 18, 1812, less than a month before the election, Shelby acquiesced and announced his candidacy. [47]

During the campaign Shelby's political enemies, notably Humphrey Marshall, criticized his response to Jefferson's second letter regarding the Gen^l affair and questioned his loyalty to the United States. [48] Shelby contended that his noncommittal response to the letter was meant to draw the federal government's attention to the situation in the west. [48] He cited the agreement between Washington and the Spanish as evidence that his ploy had worked. [48] He also claimed to have known at the time he wrote the letter that the French scheme

was destined to fail.[48]

Slaughter's supporters mocked Shelby's advanced age (he was almost 62), calling him "Old Daddy Shelby". One Kentucky paper even printed an anonymous charge that Shelby had run from the Battle of King's Mountain. Though few even among Shelby's enemies believed the story, his supporters and Shelby himself responded through missives in the state's newspapers. One supporter typified these responses, writing "It is reported that Colonel Shelby 'run [sic] at King's Mountain.' True he did. He first run [sic] up to the enemy... then after an action of about forty-seven minutes, he run [sic] again with 900 prisoners." [49]

As the canvass stretched into August, Shelby grew more confident of victory and began preparations to return to the state house. He predicted a victory of 10,000 votes; the final margin was more than 17,000.[50] When he took the oath of office, Shelby became the first Kentucky governor to serve non-consecutive terms. (James Garrard had been permitted to serve consecutive terms in 1796 and 1800 by special legislative exemption.)

Preparations for the war dominated Shelby's second term. Two days before his inauguration, he and outgoing governor Charles Scott met at the state house to appoint William Henry Harrison commander of the Kentucky militia. This was done in violation of a constitutional mandate that the post be held by a native Kentuckian. Already commander of the militias of Indiana and Illinois, Harrison picked up Kentucky volunteers at Newport before hurrying to the defense of Fort Wayne.[51]

Shelby pressured President James Madison to give Harrison command of all military forces in the Northwest.[44] Madison acceded, rescinding his earlier appointment of James Winchester.[51] On the state level, Shelby revised militia laws to make every male between the ages of 18 and 45 eligible for military service; ministers were excluded from the provision.[44] Seven thousand volunteers enlisted, and many more had to be turned away.[52] Shelby encouraged the state's women to sew and knit items for Kentucky's troops.[44]

Shelby's confidence in the federal government's war planning was shaken by the disastrous Battle of Frenchtown in which a number of Kentucky soldiers died.[44] He vowed to personally act to aid the war effort should the opportunity arise, and was authorized by the legislature to do so.[44] In March 1813, Harrison requested another 1,200 Kentuckians to join him at Fort Meigs.[53] Shelby dispatched the requested number, among whom was his oldest son James, under General Green Clay.[54][54] The reinforcements arrived to find Fort Meigs under siege by a combined force of British and Indians.[54] Clay's force was able to stop the siege, but a large number of them were captured and massacred by Indians.[55] Initial reports put James Shelby among the dead, but he was later discovered to have been captured and released in a prisoner exchange.[55]

On July 30, 1813, General Harrison again wrote Shelby requesting volunteers, and this time he asked that Shelby lead them personally.[44] Shelby raised a force of 3,500 volunteers, double the number Harrison requested.[1] Future governor John J. Crittenden served as Shelby's aide-de-camp.[56] Now a Major General, Shelby led the volunteers to join Harrison in a campaign that culminated in the American victory at the Battle of the Thames.[1]

In Harrison's report of the battle to Secretary of War John Armstrong, Jr., he said of Shelby, "I am at a loss to how to mention [the service] of Governor Shelby, being convinced that no eulogism of mine can reach his merit." [57] In 1817, Shelby received the thanks of Congress and was awarded the Congressional Gold Medal for his service in the war.[45] Friends of Shelby suggested he run for Vice President, but Shelby quickly and emphatically declined.[58]

[edit] Later life and death

Upon Shelby's leaving office in 1816, President Monroe offered him the post of Secretary of War, but he declined because of his age.[2] Already a founding member of the Kentucky Bible Society, Shelby consented to serve as vice-president of the New American Bible Society in 1816.[59] He was a faithful member of Danville Presbyterian church, but in 1816, built a small

nondenominational church on his property.[60] In 1818, he accompanied Andrew Jackson in negotiating the Jackson Purchase with the Chickasaw.[4] He also served as the first president of the Kentucky Agricultural Society in 1818 and was chairman of the first board of trustees of Centre College in 1819.[2]

In 1820 Shelby was stricken with paralysis in his right arm and leg.[23] He died of a stroke on July 18, 1826, at his home in Lincoln County.[30] He was buried on the grounds of his estate, Traveller's Rest.[2] The state erected a monument over his grave in 1827.[27] In 1952 the Shelby family cemetery was given to the state government and became the Isaac Shelby Cemetery State Historic Site.[27]

[edit] Legacy

Shelby's patriotism is believed to have inspired the Kentucky state motto: "United we stand, divided we fall". He was fond of The Liberty Song, a 1768 composition by John Dickinson, which contains the line "They join in hand, brave Americans all, By uniting we stand, by dividing we fall." [61] Though he is sometimes credited with designing the state seal, his public papers show that the design was suggested by James Wilkinson.[62]

Centre College began awarding the Isaac Shelby Medallion in 1972, and since then, it has become the College's most prestigious honor. Those awarded the Medallion exemplify the ideals of service to Centre and dedication to the public good that were embraced by Shelby during his time at Centre and in Kentucky.[63]

[edit] Places named for Isaac Shelby

Counties in nine states[64] have been named in honor of Isaac Shelby, as have a number of cities and military installations.

Counties

Military installations

Cities and towns

Shelby, Oceana County, Michigan[68]

Shelby, Mississippi

Shelby, New York[64]

Shelby, North Carolina[69]

Shelby, Ohio[70]

Shelby Township, Michigan[71]

Shelbyville, Illinois[64]

Shelbyville, Indiana[64]

Shelbyville, Kentucky[64]

Shelbyville, Missouri[64]

Shelbyville, Tennessee[72]

Shelbyville, Texas[73]

[edit] See also

[edit] References

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- [^] a b c d e f g h i j k l m R. Powell, p. 14
- [^] a b c d e f g h W. Powell, p. 326
- [^] a b c NGA Bio
- [^] a b c Townsend, p. 16
- [^] Wrobel, p. 10
- [^] Wrobel, p. 11â [^]12
- [^] a b Draper, p. 412
- [^] a b c d e f g h i Johnson, p. 1261
- [^] Draper, p. 413
- [^] Fredriksen, p. 627
- [^] a b c d Wrobel, p. 37
- [^] Wrobel, pp. 38â [^]39
- [^] Wrobel, pp. 39â [^]40
- [^] a b c Wrobel, p. 41
- [^] Wrobel, pp. 41â [^]42
- [^] a b c d e f Beasley, p. 2

- ^ a b Wrobel, p. 45
- ^ a b Wrobel, p. 46
- ^ Wrobel, p. 50
- ^ Wrobel, pp. 50â ^56
- ^ a b Townsend, p. 17
- ^ a b Draper, p. 416
- ^ Wrobel, pp. 56â ^57
- ^ Wrobel, pp. 61â ^63
- ^ Wrobel, p. 64
- ^ a b c d e f g h i j W. Powell, p. 327
- ^ Draper, pp. 414â ^415
- ^ Wrobel, p. 131
- ^ a b c d Encyclopedia of Kentucky, p. 71
- ^ a b Beasley, p. 3
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- ^ Wrobel, pp. 91â ^92
- ^ a b Wrobel, p. 92
- ^ Beasley, p. 4
- ^ Cooke, pp.162â ^163
- ^ Cooke, pp. 163â ^164
- ^ Cooke, pp. 164â ^165
- ^ Cooke, pp. 165â ^166
- ^ Cooke, pp. 166â ^167
- ^ Cooke, p. 166
- ^ a b c d e f g h Beasley, p. 5
- ^ a b Townsend, p. 18
- ^ Wrobel, p. 105
- ^ Wrobel, p. 107
- ^ a b c d Cooke, p. 168
- ^ Wrobel, pp. 107â ^108
- ^ Wrobel, p. 109
- ^ a b Wrobel, p. 110
- ^ Wrobel, p. 111
- ^ Wrobel, p. 113
- ^ a b c Wrobel, p. 114
- ^ a b Wrobel, p. 115
- ^ Wrobel, p. 120
- ^ Johnson, p. 1262
- ^ Wrobel, p. 132
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[edit] Further reading

[edit] External links

The Chicago Board of Trade Building is a skyscraper located in Chicago,

Illinois, United States. It stands at 141 W. Jackson Boulevard at the foot of the LaSalle Street canyon, in the Loop community area in Cook County. Built in 1930 and first designated a Chicago Landmark on May 4, 1977,[2] the building was listed as a National Historic Landmark on June 2, 1978.[3][4] It was added to the National Register of Historic Places on June 16, 1978. Originally built for the Chicago Board of Trade (CBOT), it is now the primary trading venue for the derivatives exchange, the CME Group, formed in 2007 by the merger of the CBOT and the Chicago Mercantile Exchange.[5]

The 141 W. Jackson address hosted the former tallest building in Chicago designed by William W. Boyington before the current Holabird & Root structure, which held the same title for over 35 years[6] until being surpassed in 1965 by the Richard J. Daley Center. The current structure is known for its art deco architecture, sculptures and large-scale stone carving, as well as large trading floors. A three-story art deco statue of Ceres, goddess of agriculture (particularly grain), caps the building. The building is a popular sightseeing attraction and location for shooting movies, and its owners and management have won awards for efforts to preserve the building and for office management.

[edit] Early history

[edit] Early locations

On April 3, 1848, the Board of Trade opened for business at 101 South Water Street. When 122 members were added in 1856, it was moved to the corner of South Water and LaSalle Streets. After another temporary relocation west on South Water Street in 1860, the first permanent home was established within the Chamber of Commerce Building on the corner of LaSalle and Washington Streets in 1865. In 1871, the Great Chicago Fire destroyed this building. The exchange temporarily reopened two weeks after the fire in a 90 feet (27 m) wooden building known as "the Wigwam" at the intersection of Washington and Market Streets,[7] before reclaiming its home in a new building constructed at the Chamber of Commerce site one year later.

[edit] Permanent home

In 1882, construction began of the CBOT's new home, which opened at the current location on May 1, 1885. It was designed by William W. Boyington, known previously for his work on the Chicago Water Tower. Built from structural steel and Maine granite, with a rear of enameled brick, it was 10 stories tall and featured a tower 320 ft (98 m) tall containing a large clock and 4,500 pounds (2,000 kg; 320 st) bell, topped by a 9 feet (2.7 m) copper weather vane in the shape of a ship. Construction cost \$1.8 million (about 46 million in 2013 terms). With four elevators and a great hall 80 ft (24 m) high decorated by a stained-glass skylight and ornate stone balusters,[8] it was the first commercial building in Chicago to have electric lighting.[9] It was also the first building in the city to exceed 300 ft (91 m) in height and at the time was the tallest building in Chicago.

The building attracted tourists, visitors, and protesters. Viewing galleries were opened to the public for the first time in honor of the 1893 World's Columbian Exposition.[7] The April 28, 1885 inaugural banquet for the building opening was marched on by a sizable column of Chicago labor activists, under the International Working People's Association banner and led by Albert Parsons, Lucy Parsons, and Lizzie Holmes. "The building, on which two million dollars had been lavished in the midst of an economic depression, was denounced by the anarchists as... the crowning symbol of all that was hateful in the private property system." [10]

The procession were cheered by thousands of spectators. Their access to the Board of Trade was blocked by a phalanx of police, first at Jackson, then at LaSalle, finally coming to within a half-block of the building, "bathed in a sea of electric light only recently installed for the occasion." [10]

Statue of Industry

Statue of Agriculture

In 1895, the clock tower was removed and the "tallest building in Chicago" record was then held by the 302 ft (92 m) tall Masonic Temple Building.[11] Built on caissons surrounded by muck, the trading house was rendered structurally unsound in the 1920s when construction began across the street on the Federal Reserve Bank of Chicago. The 1885 building was subsequently demolished in 1929,[12] and the exchange temporarily moved to Van Buren and Clark while a new building was constructed at the LaSalle and Jackson site.

The 1885 allegorical architectural sculptures of 35 ft (11 m) Industry and Agriculture, two figures of a four-piece set, were removed from the original building and now stand in a nearby pedestrian plaza.[13]

[edit] The 1930 building

[edit] Architecture

In 1925, the Chicago Board of Trade commissioned Holabird & Root to design the current building. The general contractors Hegeman & Harris built it for \$11.3 million, although the reported twenty-year mortgage value was \$12 million[14][15] (\$12 million in 1925 equates to about 160 million in 2013 dollars). Clad in gray Indiana limestone, topped with a copper pyramid roof, and standing on a site running 174 ft (53 m) east to west on Jackson Boulevard and 240 ft (73 m) north to south on LaSalle Street, the 605 ft (184 m) tall art deco-styled building opened on June 9, 1930. It serves as the southern border for the skyscrapers hugging LaSalle Street and is taller than surrounding structures for several blocks. The Chicago Board of Trade has operated continuously on its fourth floor since the 1930 opening, dedicating 19,000 square feet (1,800 m²) to what was then the world's largest trading floor.[16] The advent of steel frame structural systems allowed completely vertical construction; but as with many skyscrapers of the era, the exterior was designed with multiple setbacks at increasing heights, which served to allow additional light into the ever-deepening concrete valleys in urban cores. At night, the setbacks are upwardly lit by floodlights, further emphasizing the structure's vertical elements. The night illumination design was a common contemporary Chicago architectural theme, seen also in the Wrigley Building, the Jewelers Building, the Palmolive Building, the LaSalle-Wacker Building, and the Tribune Tower.[17] Interior decoration includes polished surfaces throughout, the use of black and white marble, prominent vertical hallway trim, and an open three-story lobby which at the time of opening housed the world's largest light fixture. Though One LaSalle Street had five more floors, the CBOT building was the first in Chicago to exceed a height of 600 ft (180 m). After surpassing the Chicago Temple Building, it was the tallest in Chicago until the Daley Center was completed in 1965. Known for its work on the Brooklyn Bridge, the family-operated factory of John A. Roebling supplied all of the cables used in the building's 23 Otis elevators.[18][19] Beneath the main trading floor over 2,700 miles (4,300 km) of telephone and telegraph wires were once hidden. No less than 150,000 miles (240,000 km) of wires (considered possibly the most direct long-distance wire from any building) once ran from the room.[20] Although the building was commissioned for the Chicago Board of Trade, its first tenant was the Quaker Oats Company, which moved in on May 1, 1930.[21]

[edit] Artwork

Sculptural work by Alvin Meyer, the one-time head of Holabird & Root's sculpture department, is prominent on the building's facade, and represents the trading activities within. On each side of the 13 ft (4.0 m) diameter clock facing LaSalle Street are hooded figures, an Egyptian holding grain and a Native American holding corn.[22][23][24] Similar figures are repeated at the uppermost corners of the central tower, just below the sloping roof. About 30 ft (9.1 m) above street level, representations of bulls protrude directly from the limestone cladding on the building's north side and to a lesser degree on the east side, a reference to a bull market.

The central structure is capped by a 6,500 pound, 31 ft (9.4 m) tall aluminum statue by sculptor John H. Storrs of the Roman goddess of grain, Ceres, holding

a sheaf of wheat in the left hand and a bag of corn in the right hand, as a nod to the exchange's heritage as a commodities market. This statue was assembled from 40 pieces.[25][26]

Commissioned in 1930 but removed from the agricultural trading room in 1973 and stored until 1982, John W. Norton's three-story mural of Ceres shown bare-breasted in a field of grain underwent extensive restoration in Spring Grove, Illinois by Louis Pomerantz before being displayed in the atrium of the 1980s addition.[27][28]

[edit] Trading floor

According to the June 16, 1930 issue of Time magazine, visitors carrying ripened wheat heads stared in curiosity at the six-story tall trading room directly above the lobby and behind the large windows below the clock facing LaSalle Street. At the center of the room, Time reported on the items being traded in "pits" organized based on commodities type with pits names such as the corn pit, soybean pit or wheat pit. The individual pits are raised octagonal structures where open outcry trading occurs. Steps up the outside of each octagon provide an amphitheater atmosphere, and enable a large number of traders to see each other and communicate during trading hours. With early versions dating back to 1870, this type of trading pit was patented in 1878.[7]

The trading area is surrounded by desks allowing workers to support transactions. In the early days, the desks served as a relay point between the pits and those wishing to buy or sell. When trade orders and information began to be communicated by telegraph, Morse code operators were employed, later replaced by phone operators. In the late 20th century, electric display boards lined the walls of the trading hall and the advent of electronic trading resulted in computers being placed on desktops.

Subsequent additions to the Board of Trade Building moved the agricultural and financial trading floors out of the original trading room and into new spaces in the additions to the building's rear in the 1980s. In 2004 the historic 1930 trading floor, already substantially altered (and unused for more than two years), was demolished and its pits filled with concrete. It was renovated in a modern style and now is leased to a privately owned options trading firm.[29]

[edit] Expansion

In 1980, the owners added a 275 ft (84 m) 23-story expansion to the south side of the building.[30] It was topped by an octagonal ornament shaped similarly to the terraced trading pits and was designed in a postmodern style by Helmut Jahn. Colored black and silver, with a sunlit atrium on the 12th floor facing the south wall of the older structure, the annex provided a four-story granite lined agricultural trading floor, then the world's largest at 32,000 square feet (2,970 m²).[7] Even as the Sydney Futures Exchange and other markets were ceasing outcry trading, Mayor Richard M. Daley led the groundbreaking on January 17, 1995, for additional expansion into a five-story building to the east designed by architects Fujikawa Johnson and structural engineers TT-CBM. When opened in 1997, the \$175 million structure would add 60,000 square feet (5,570 m²) of trading space and for a period again would house the world's largest trading floor.[7][16][31] It was nicknamed the "Arboretum" by some in reference to expansion supporter CBOT Chairman Patrick H. Arbor.[16] The expansion included price boards 600 feet (183 m) long and supported 12,000 computers, 6,000 voice devices, and 2,000 video devices requiring 27,000 miles (43,500 km) of cable.[32] Collectively, the trading floors now encompass approximately 115,150 square feet (10,700 m²).[33] The logo of the CBOT represents a trading pit, and appears prominently on stonework facing Clark Street and on street-level barriers at the service entrance on Van Buren Street. The addition has a twelve-story atrium and melds historical and contemporary design with art deco references such as setbacks, central tower, symmetrical projecting wings, pyramidal roof and abstract cascade and scallop lobby design.[34] Between the original and new buildings, where there was formerly a street, a wide street-level walkway connects the plaza on LaSalle Street to Van Buren Street in what would ordinarily be the building's first floor. Passing over the Van Buren Street elevated tracks, a green

glass-enclosed steel-frame bridge connects the lower southwest corner of the 23rd story addition to the Chicago Board Options Exchange (although this bridge was closed to pedestrian traffic in the wake of the September 11, 2001 attacks for security reasons).

[edit] Renovation

In 2005, the building underwent an extensive \$20^{million} renovation directed by Chicago architect Gunny Harboe, whose restoration work included Loop landmarks the Rookery Building and Reliance Building. The project included restoration of the main lobby to emphasize the design features of the art deco era, elevator modernization, facade renovation and cleaning, and the continued renovation of upper floor corridors and hallways.[35][36] Though impractically small for modern use, mailboxes in the lobby were restored to their original condition to follow the theme of vertical lines found throughout the complex.[37] An improved electrical infrastructure, with ten main feeds from seven different Commonwealth Edison electrical substations, was added in addition to redundant cooling systems and upgraded telecommunications capabilities.

When the old CBOT building was demolished in 1929, two 4.5 short tons (4.0^{long tons}; 4.1^t) 12^{ft} (3.7^m) tall gray granite statues of classically styled goddesses (pictured above) were moved from the second floor ledge above the main entrance into the gardens of the 500 acre (2^{km²}) estate of Arthur W. Cutten, a wheat and cotton speculator who went bankrupt during the Great Depression. One goddess represents agriculture and is shown standing with wheat and leaning on a cornucopia. The other represents industry and appears with the bow of a ship and an anvil.

The statues were found in 1978 near Glen Ellyn, Illinois by the Forest Preserve District of DuPage County, on land acquired from Cutten's estate. After being displayed in a parking lot at Danada Forest Preserve for several years, both were returned to the CBOT building's plaza and rededicated on June 9, 2005.[12][38]

[edit] Later history

[edit] Surroundings

The LaSalle Street canyon is home to other historic buildings including the Rookery Building, a National Historic Landmark considered to be the oldest standing high-rise. A 1907 renovation included a lobby remodeled by Frank Lloyd Wright in the Prairie School style.[39] The name rookery comes from the previous building on the property which became home to many birds, especially pigeons. The nearby Reliance Building was the first skyscraper to have large plate glass windows comprise the majority of its surface area, and One North LaSalle was for some time one of Chicago's tallest buildings. Both the Reliance Building and One North LaSalle are on the National Register of Historic Places. Since 1853, the governments of Chicago and Cook County have shared three different buildings at the north end of the canyon. The current Chicago City Hall, built in a Classical Revival style, was designed to symbolize the strength, dignity, and vigor of the government.[40] Completed in 2001, an award winning green roof was incorporated into the structure.[41] All of the structures are designated as Chicago Landmarks.

Other nearby buildings of note include the Continental Commercial National Bank, now called 208 South LaSalle Street, which broke records in 1911 as the city's most expensive development, with a cost exceeding \$10^{million}. The Rand-McNally Building that had served as the headquarters of the World's Columbian Exposition was demolished to accommodate the structure.[42] The Federal Reserve Bank of Chicago, at 230 South LaSalle Street, was built in a Greco-Roman style and contained the largest vaults in the world and one of the first building-wide wired communication systems.[43] Both the Federal Reserve Bank and 208 South LaSalle demonstrate the popularity of neoclassical architecture during the late 19th and early 20th centuries and were meant to project a sense of financial security.[42]

One^{mile} (1.6^{km}) west of Lake Michigan and in the southwest corner of the Loop, the building is near two elevated stations of the Chicago 'L'. The Quincy

station is one block to the west and the LaSalle/VanBuren station is between the CBOT and the Chicago Stock Exchange. Additionally, CTA Blue Line service is provided at the Jackson and LaSalle stations, each two blocks away. Union Station stands five blocks to the west on Jackson Boulevard, providing terminal service for Amtrak and select service for Metra. Additional Metra service is provided at the LaSalle Street Station, two blocks due south.

[edit] Recent history

In September 2011,[44] the intersection of LaSalle Street and Jackson Boulevard in front of the building became the headquarters for the Occupy Chicago protest movement.[45][46]

[edit] Tenants

The CME Group occupies 33 percent of available space, while financial and trading concerns occupy 54 percent of the three-building complex. In addition to Ceres Restaurant on the first floor of the lobby, other businesses provide banking, insurance, travel services, beauty services, and healthcare. Some business have been in the building for over 40 years,[37] and throughout its history, commodities speculators, such as "Prince of the Pit" Richard Dennis, have maintained offices in the building. In 2007, the U.S. Futures Exchange, a competitor of the CBOT formerly known as Eurex US, announced a move from the Sears Tower into the 14th floor of the CBOT building.[47]

[edit] Visitors

The CBOT building has been the site of a number of visits by dignitaries, including the Prince of Wales in October 1977. In 1991, George H. W. Bush became the first President of the United States to visit the Exchange, where he delivered a speech from the soybean pit regarding the importance of agriculture to the American economy.[48] A visit from former Soviet leader Mikhail Gorbachev followed on May 7, 1992. In 2006, former US President Jimmy Carter and wife Rosalyn toured the CBOT while campaigning for their son Jack's run for a U.S. Senate seat from Nevada.[49] During the 1996 Democratic National Convention, US Vice President Al Gore was hosted at the Exchange's Democratic Senatorial Campaign reception.[7] When US President George W. Bush toured the agricultural trading floor on January 6, 2006, he was hailed from the corn trading pit with "Hook 'em, Horns!", a reference to his adopted home state of Texas.[37][50] Interest groups such as the Chicago Architecture Foundation provide scheduled tours showcasing the architecture and selected portions of the trading operations.

[edit] Awards and honors

1985: the 23-story addition won the Best Structure Award from the Structural Engineers Association of Illinois.[51]

2006: the building was awarded the Landmarks Illinoisâ annual Real Estate and Building Industries Council award for its preservation efforts.[52]

2006: the Building Owners and Managers Association of Chicago presented the CBOT building with The Office Building of the Year award recognizing the high quality of office space and excellence in management of the building.[53]

[edit] In popular culture

Literature

The 1885 building and trading pits were prominently featured in *The Pit*, the second novel by Frank Norris in *The Epic of the Wheat* trilogy.[54][55] Life on the trading floor of the Chicago Board of Trade is detailed in the nonfiction 2004 book *Leg the Spread* by Cari Lynn.[56]

Film and television

Trading operations have been used as scenes in movies such as *Ferris Bueller's Day Off*,[57][58] and the streetscape in the LaSalle Street canyon is used in the movies *The Untouchables* and *Road to Perdition*.^{[59][60]} In the 2005 film *Batman Begins* the building serves as the headquarters of the fictional Wayne Enterprises,[61] but in the 2008 sequel, *The Dark Knight*, Wayne Enterprises was represented by the Richard J. Daley Center.[62] The building itself appears in *The Dark Knight*.^[63]

While maintaining studios in the building for many years, WCIU-TV broadcast the *Stock Market Observer*, a daily seven-hour live business television news

program that is listed in the Guinness Book of World Records for the show telecast the most hours.[64] Additionally, the station broadcasts First Business with news of the Chicago Board of Trade. Former WVON-AM radio personality Don Cornelius began the popular dance show Soul Train in a cramped studio on the 43rd floor in 1970. When Cornelius moved the show to Los Angeles a year later, his assistant, Clinton Ghent took over the local show until it ended in 1976. Prior to Soul Train, shows filmed in the building were Kiddie A Go-Go, a dance show aimed at the pre-teen market which premiered in 1965 and Red Hot and Blues, a teen dance show hosted by local DJ Big Bill Hill which premiered in 1967.[65]

Graphic arts

Although depicted with the tower in a Rand McNally map from 1893, later lithographs of the first 141 Jackson Street location display a red-roofed building without a tower. Memorabilia of the current building is abundant, with postcards of panoramic scenes from LaSalle Street, the clock, and lighted upper decks having been produced for decades. In views from the Museum Campus, the building's crown is framed by the middle floors of the taller Sears Tower in the background. Photographer Andreas Gursky has used the location for still life prints such as 1997's Chicago Board of Trade, I and 1999's Chicago Board of Trade, II. A photograph of the exterior, from the Museum series by Thomas Struth, is in the collection of the Metropolitan Museum of Art in New York City. An often-reproduced painting by Leslie Ragan for the New York Central Railroad depicts streamliner locomotives idling at LaSalle Street Station with the Board of Trade Building looming prominently in the background.[66]

At 1211 North LaSalle Street on the city's Near North Side, a 16-story apartment hotel built in 1929 and converted into an apartment building in 1981 was used by muralist Richard Haas for trompe-l'œil murals in homage to Chicago School architecture. One of the building's sides features the Chicago Board of Trade Building, intended as a reflection of the actual building two miles (3.2 km) south.[67][68][69]

[edit] Position in Chicago's skyline

[edit] See also

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[edit] External links

George Percy Aldridge Grainger (8 July 1882 – 20 February 1961), known as Percy Grainger, was an Australian-born composer, arranger and pianist. In the course of a long and innovative career he played a prominent role in the revival of interest in British folk music in the early years of the 20th century. He also made many adaptations of other composers' works. Although much of his work was experimental and unusual, the piece with which he is most generally associated is his piano arrangement of the folk-dance tune "Country Gardens".

Grainger left Australia at the age of 13 to attend the Hoch Conservatory in Frankfurt. Between 1901 and 1914 he was based in London, where he established himself first as a society pianist and later as a concert performer, composer and collector of original folk melodies. As his reputation grew he met many of the significant figures in European music, forming important friendships with Frederick Delius and Edvard Grieg. He became a champion of Nordic music and culture, his enthusiasm for which he often expressed in private letters.

In 1914 Grainger moved to the United States, where he lived for the rest of his life, though he travelled widely in Europe and in Australasia. He served briefly as a bandsman in the US Army during 1917–18, and took US citizenship in 1918. After his mother's suicide in 1922 he became increasingly involved in educational work. He also experimented with music machines that he hoped would

supersede human interpretation. In the 1930s he set up the Grainger Museum in Melbourne, his birthplace, as a monument to his life and works and as a future research archive. As he grew older he continued to give concerts and to revise and rearrange his own compositions, while writing little new music. After the Second World War, ill health reduced his levels of activity, and he considered his career a failure. He gave his last concert in 1960, less than a year before his death.

[edit] Early life

[edit] Family background

Percy Grainger's father, John Grainger (1854–1917),^[n 1] was a British-born architect who emigrated to Australia in 1877. He won professional recognition for his design of the Princes Bridge across the Yarra River in Melbourne.^[2] In October 1880 he married Rose Annie Aldridge, daughter of Adelaide hotelier George Aldridge; the couple settled in New St, Brighton, a suburb of Melbourne, where their only son, christened George Percy Grainger, was born on 8 July 1882.^[3] The Grainger house at 305 New St, Brighton has recently been redeveloped, with the original structure intact.

John Grainger was an accomplished artist, with broad cultural interests and a wide circle of friends.^[4] These included David Mitchell, whose daughter Helen later gained worldwide fame as an operatic soprano under the name Nellie Melba. John's claims to have "discovered" her are unfounded, although he may have offered her encouragement.^[5] John was a heavy drinker and a womaniser who, Rose learned after the marriage, had fathered a child in England before coming to Australia. His promiscuous lifestyle placed heavy strains upon the relationship, particularly when Rose discovered shortly after Percy's birth that she had contracted a form of syphilis from her husband.^{[3][4]} Despite this, the Graingers stayed together until 1890, when John went to England for medical treatment. After his return to Australia they lived apart; the burden of raising Percy fell to Rose,^[6] while John pursued his career as chief architect to the Western Australian Department of Public Works. He also designed Nellie Melba's home, Coombe Cottage, at Coldstream.^[2]

[edit] Childhood

Except for three months' formal schooling as a 12-year-old, during which he was bullied and ridiculed by his classmates, Percy was educated at home.^[4] Rose, an autodidact with a dominating presence, supervised his music and literature studies and engaged other tutors for languages, art and drama. From his earliest lessons Percy developed a lifelong fascination with Nordic culture; writing late in life he maintained that the Icelandic "Saga of Grettir the Strong" was "the strongest single artistic influence on my life".^{[7][8][9]} As well as showing precocious musical talents, he displayed considerable early gifts as an artist, to the extent that his tutors thought his future might lie in art rather than music.^[10] At the age of 10 he began studying piano under Louis Pabst, a German emigrant then considered to be Melbourne's leading piano teacher. Grainger's first known composition, "A Birthday Gift to Mother", is dated 1893.^[2] Pabst arranged Grainger's first public concert appearances, at Melbourne's Masonic Hall in July and September 1894. The boy played works by Bach, Beethoven, Schumann and Scarlatti, and was warmly complimented in the Melbourne press.^[11]

After Pabst returned to Europe in the autumn of 1894, Grainger's new piano tutor, Adelaide Burkitt, arranged for his appearances at a series of concerts in October 1894, at Melbourne's Royal Exhibition Building. The size of this enormous venue horrified the young pianist; nevertheless, his performance delighted the Melbourne critics who dubbed him "the flaxen-haired phenomenon who plays like a master".^[12] This public acclaim helped Rose to decide that her son should continue his studies at the Hoch Conservatory in Frankfurt am Main, Germany – she had been recommended to this institution by William Laver, head of piano studies at Melbourne's Conservatorium of music. Financial assistance was secured through a fund-raising benefit concert in Melbourne and a final recital in Adelaide, after which mother and son left Australia for Europe on 29 May 1895.^[13] Although he never returned permanently to Australia,

Grainger maintained considerable patriotic feelings for his native land,[14] and was proud of his Australian heritage.[2]

[edit] Frankfurt

In Frankfurt, Rose established herself as a teacher of English; her earnings were supplemented by contributions from John Grainger, who had settled in Perth. The Hoch Conservatory's reputation for piano teaching had been enhanced by the tenure, until 1892, of Clara Schumann as head of piano studies. Grainger's piano tutor was James Kwast, who developed his young pupil's skills to the extent that, within a year, Grainger was being lauded as a prodigy.[15] Grainger had difficult relations with his original composition teacher, Iwan Knorr;[4] he withdrew from Knorr's classes to study composition privately with an amateur composer and folk-music enthusiast, Karl Klimesch, whom he would later honour as "my only composition teacher".[2]

Together with a group of slightly older British students â ^ Roger Quilter, Balfour Gardiner, Cyril Scott and Norman O'Neill, all of whom became his friends â ^ Grainger helped form the "Frankfurt Group", whose long-term objective was to rescue British and Scandinavian music from what they considered the negative influences of central European music.[4] Encouraged by Klimesch, Grainger turned away from composing classical pastiches reminiscent of Handel, Haydn and Mozart,[16] and developed a personal compositional style the originality and maturity of which quickly impressed and astonished his friends.[14] At this time Grainger discovered the poetry of Rudyard Kipling and began setting it to music; according to Scott, "No poet and composer have been so suitably wedded since Heine & Schumann".[14]

After accompanying her son on an extended European tour in the summer of 1900 Rose, whose health had been poor for some time, suffered a nervous collapse and could no longer work.[17] To replace lost income Grainger began giving piano lessons and public performances; his first solo recital was in Frankfurt on 6 December 1900.[2] Meanwhile he continued his studies with Kwast, and increased his repertoire until he was confident he could maintain himself and his mother as a concert pianist. Having chosen London as his future base, in May 1901 Grainger abandoned his studies and, with Rose, left Frankfurt for England.[17]

Before leaving Frankfurt, Grainger had fallen in love with Kwast's daughter Mimi;[17] in an autobiographical essay dated 1947 he admits to being "already sex-crazy" at this time.[18] (Mimi Kwast, who was the grand-daughter of Ferdinand Hiller, married another of her father's pupils, Hans Pfitzner.) John Bird, Grainger's biographer, also records that during his Frankfurt years Grainger began to develop sexual appetites that were "distinctly abnormal"; by the age of 16 he had started to experiment in flagellation and other sado-masochistic practices, which he continued to pursue through most of his adult life. Bird surmises that Grainger's fascination with themes of punishment and pain derived from the harsh discipline to which Rose had subjected him as a child.[18]

[edit] London years

[edit] Concert pianist

In London, Grainger's charm, good looks and talent (with some assistance from the local Australian community) ensured that he was quickly taken up as a pianist by wealthy patrons, and was soon performing in concerts in private homes. The Times critic recorded after one such appearance that Grainger's playing "revealed rare intelligence and a good deal of artistic insight".[19] In 1902 he was presented by the socialite Lillith Lowrey to Queen Alexandra, who thereafter frequently attended his London recitals.[20] Lowrey, 20 years Grainger's senior, traded patronage and contacts for sexual favours â ^ he termed the relationship a "love-serve job".[8] She was the first woman with whom he had sex; he later wrote of this initial encounter that he had experienced "an overpowering landslide" of feeling, and that "I thought I was about to die. If I remember correctly, I only experienced fear of death. I don't think that any joy entered into it".[21]

In February 1902 Grainger made his first appearance as a piano soloist with an orchestra, playing Tchaikovsky's first piano concerto with the Bath Pump Room

Orchestra. In October of that year he toured Britain in a concert party with Adelina Patti, the Italian-born opera singer. Patti was greatly taken by the young pianist and prophesied a glorious career for him.[22] The following year he met the German-Italian composer and pianist Ferruccio Busoni. Initially the two men were on cordial terms (Busoni offered to give Grainger lessons free of charge) and as a result, Grainger spent part of the 1903 summer in Berlin as Busoni's pupil.[2] However, the visit was not a success; as Bird notes, Busoni had expected "a willing slave and adoring disciple", a role Grainger was not willing to fulfil.[23] Grainger returned to London in July 1903; almost immediately he departed with Rose on a 10-month tour of Australia, New Zealand and South Africa, as a member of a party organised by the Australian contralto Ada Crossley.[24]

[edit] Emergent composer

Before going to London Grainger had composed numerous Kipling settings, and his first mature orchestral pieces.[25] In London, when he found time he continued to compose; a letter to Balfour Gardiner dated 21 July 1901 indicates that he was working on his *Marching Song of Democracy* (a Walt Whitman setting), and had made good progress with the experimental works *Train Music* and *Charging Irishry*. [26] In his early London years he also composed *Hill Song Number 1* (1902), an instrumental piece much admired by Busoni.[25][27]

In 1905, inspired by a lecture given by the pioneer folksong historian Lucy Broadwood, Grainger began to collect original folksongs. Starting at Brigg in Lincolnshire, over the next five years he gathered and transcribed more than 300 songs from all over the country, including much material that had never been written down before. From 1906 Grainger used a phonograph, one of the first collectors to do so, and by this means he assembled more than 200 Edison cylinder recordings of native folk singers.[28][29] These activities coincided with what Bird calls "the halcyon days of the 'First English Folksong Revival'".[30]

As his stature in the music world increased, Grainger became acquainted with many of its leading figures, including Vaughan Williams, Elgar, Richard Strauss and Debussy.[28] In 1907 he met Frederick Delius, with whom he achieved an immediate rapport â ^ the two musicians had similar ideas about composition and harmony, and shared a dislike for the classical German masters.[31] Both were inspired by folk music;[32] Grainger gave Delius his setting of the folksong *Brigg Fair*, which the older composer developed into his famous orchestral rhapsody, dedicated to Grainger.[31] The two remained close friends until Delius's death in 1934.[33]

Grainger first met Grieg at the home of the London financier Sir Edgar Speyer, in May 1906.[34] As a student Grainger had learned to appreciate the Norwegian's harmonic originality, and by 1906 had several Grieg pieces in his concert repertoire, including the piano concerto.[35] Grieg was greatly impressed with Grainger's playing, and wrote that the Australian was "a genius that we Scandinavians cannot do other than love." [36] Through 1906â ^7 the two maintained a mutually complimentary correspondence, which culminated in Grainger's ten-day visit in July 1907 to the composer's Norwegian home, "Troldhaugen" near Bergen. Here the two spent much time revising and rehearsing the piano concerto in preparation for that year's Leeds Festival. Their plans for a long-term working relationship were thwarted by Grieg's sudden death in September 1907; this relatively brief acquaintance had a considerable impact on Grainger, and he championed Grieg's music for the rest of his life.[35]

After fulfilling a hectic schedule of concert engagements in Britain and continental Europe, in August 1908 Grainger accompanied Ada Crossley on a second Australasian tour, during which he added several cylinders of Maori and Polynesian music to his collection of recordings.[28] He had resolved to establish himself as a top-ranking pianist before promoting himself as a composer,[9] though he continued to compose both original works and folksong settings. Some of his most successful and most characteristic pieces, such as "Mock Morris", "Handel in the Strand", "Shepherd's Hey" and "Molly on the Shore" date from this period. In 1908 he obtained the tune of "Country Gardens"

from the folk music specialist Cecil Sharp, though he did not fashion it into a performable piece for another ten years.[37][38] In 1911 Grainger finally felt confident enough of his standing as a pianist to begin large-scale publishing of his compositions, at the same time adopting the professional name of "Percy Aldridge Grainger".[8][39]

In a series of concerts arranged by Balfour Gardiner at London's Queen's Hall in March 1912, five of Grainger's works were performed to great public acclaim; the band of thirty guitars and mandolins for the performance of "Fathers and Daughters" created a particular impression.[40] On 21 May 1912 Grainger presented the first concert devoted entirely to his own compositions, at the Aeolian Hall, London;[9] the concert was, he reported, "a sensational success".[41] A similarly enthusiastic reception was given to Grainger's music at a second series of Gardiner concerts the following year.[42]

In 1905 Grainger began a close friendship with Karen Holten, a Danish music student who had been recommended to him as a piano pupil. She became an important confidante; the relationship persisted for eight years, largely through correspondence.[43][n 2] After her marriage in 1916 she and Grainger continued to correspond and occasionally meet until her death in 1953. Grainger was briefly engaged in 1913 to another pupil, Margot Harrison, but the relationship foundered through a mixture of Rose's over-possessiveness and Grainger's indecision.[45][46]

[edit] Career Maturity

[edit] Departure for America

In April 1914 Grainger gave his first performance of Delius's piano concerto, at a music festival in Torquay. Thomas Beecham, who was one of the festival's guest conductors, reported to Delius that "Percy was good in the forte passages, but made far too much noise in the quieter bits".[47] Grainger was receiving increasing recognition as a composer; leading musicians and orchestras were adding his works to their repertoires.[45] His decision to leave England for America in early September 1914, after the outbreak of the First World War, damaged his reputation among his patriotically minded British friends.[2] Grainger wrote that the reason for this abrupt departure was "to give mother a change".[48] However, according to Bird, Grainger often explained that his reason for leaving London was that "he wanted to emerge as Australia's first composer of worth, and to have laid himself open to the possibility of being killed would have rendered his goal unattainable".[49]The Daily Telegraph music critic Robin Legge accused him of cowardice, and told him not to expect a welcome in England after the war,[8] words that hurt Grainger deeply.[50]

Grainger's first American tour began on 11 February 1915 with a recital at New York's Aeolian Hall. He played works by Bach, Brahms, Handel and Chopin alongside two of his own compositions: "Colonial Song" and "Mock Morris". In July 1915 Grainger had formally registered his intention to apply for US citizenship.[51] Over the next two years his engagements included concerts with Nellie Melba in Boston and Pittsburgh and a command performance before President Woodrow Wilson. In addition to his concert performances, Grainger secured a contract with the Duo-Art Company for making pianola rolls, and signed a recording contract with Columbia.[9]

In April 1917 Grainger received news of John Grainger's death in Perth.[52] On 9 June 1917, after America's entry into the war, he enlisted as a bandsman in the Coast Artillery Corps of the US Army. He had joined as a saxophonist,[n 3] though he records learning the oboe: "I long for the time when I can blow my oboe well enough to play in the band".[55] In his 18 months' service, Grainger made frequent appearances as a pianist at Red Cross and Liberty bond concerts. As a regular encore he began to play a piano setting of the tune "Country Gardens". The piece became instantly popular; sheet music sales quickly broke many publishing records.[56] The work was to become synonymous with Grainger's name through the rest of his life, though he came in time to detest it.[57] On 3 June 1918 he became a naturalised American citizen.[58]

[edit] Career zenith

After leaving the army in January 1919, Grainger refused an offer to become

conductor of the Saint Louis Symphony Orchestra and resumed his career as a concert pianist.[59] He was soon performing around 120 concerts a year,[60] generally to great critical acclaim, and in April 1921 reached a wider audience by performing in a cinema, New York's Capitol Theatre. Grainger commented that the huge audiences at these cinema concerts often showed greater appreciation for his playing than those at established concert venues such as Carnegie Hall and the Aeolian.[61] In the summer of 1919 he led a course in piano technique at Chicago Musical College, the first of many such educational duties he would undertake in later years.[62][63]

Amid his concert and teaching duties, Grainger found time to rescore many of his works (a habit he continued throughout his life) and also to compose new pieces: his Children's March: Over the Hills and Far Away, and the orchestral version of The Power of Rome and the Christian Heart both originated in this period.[64] His close friend Ralph Leopold, whom he met while in the army, participated in the premieres of both versions of the Children's March, and also recorded a number of four-hand works with him on piano rolls. He also began to develop the technique of elastic scoring, a form of flexible orchestration which enabled works to be performed by different numbers of players and instrument types, from small chamber groups up to full orchestral strength.[65]

In April 1921 Grainger moved with his mother to a large house in White Plains, New York. This was his home for the remainder of his life.[8] From the beginning of 1922 Rose's health deteriorated sharply; she was suffering from delusions and nightmares, and became fearful that her illness would harm her son's career.[66] Because of the closeness of the bond between the two, there had long been rumours that their relationship was incestuous;[57] in April 1922 Rose was directly challenged over this issue by her friend Lotta Hough.[67] From her last letter to Grainger, dated 29 April, it seems that this confrontation unbalanced Rose; on 30 April, while Grainger was touring on the West Coast, she jumped to her death from an office window on the 18th floor of the Aeolian Building in New York City.[68] The letter, which began "I am out of my mind and cannot think properly", asked Grainger if he had ever spoken to Lotta of "improper love". She signed the letter: "Your poor insane mother".[69]

[edit] Inter-war years

[edit] Traveller

After Rose's funeral, Grainger sought solace in a return to work. In autumn 1922 he left for a year-long trip to Europe, where he collected and recorded Danish folksongs before a concert tour that took him to Norway, Holland, Germany and England. In Norway he stayed with Delius at the latter's summer home. Delius was by now almost blind; Grainger helped fulfil his friend's wish to see a Norwegian sunset by carrying him (with some assistance) to the top of a nearby mountain peak.[70] He returned to White Plains in August 1923.[71]

Although now less committed to a year-round schedule of concerts, Grainger remained a very popular performer. His eccentricities, often exaggerated for publicity reasons, reportedly included running into auditoriums in gym kit and leaping over the grand piano to create a grand entrance.[72] While he continued to revise and rescore his compositions, he increasingly worked on arrangements of music by other composers,[73] in particular works by Bach, Brahms, Fauré and Delius.[74] Away from music, Grainger's preoccupation with Nordic culture led him to develop a form of English which, he maintained, reflected the character of the language before the Norman conquest. Words of Norman or Latin origin were replaced by supposedly Nordic word-forms, such as "blend-band" (orchestra), "forthspeaker" (lecturer) and "writ-piece" (article). He called this "blue-eyed" English.[75] His convictions of Nordic superiority eventually led Grainger, in letters to friends, to express his views in crudely racial and anti-Semitic terms; the music historian David Pear describes Grainger as, "at root, a racial bigot of no small order".[76][n 4]

Grainger made further trips to Europe in 1925 and 1927, collecting more Danish folk music with the aid of the octogenarian ethnologist Evald Tang Kristensen; this work formed the basis of the Suite on Danish Folksongs of 1928â ^30.[9] He

also visited Australia and New Zealand, in 1924 and again in 1926. In November 1926, while returning to America, he met Ella Str m, a Swedish-born artist with whom he developed a close friendship. On arrival in America the pair separated, but were reunited in England the following autumn after Grainger's final folksong expedition to Denmark. In October 1927 the couple agreed to marry.[80] Ella had a daughter, Elsie, who had been born out of wedlock in 1909. Grainger always acknowledged her as a family member, and developed a warm personal relationship with her.[81]

Although Bird asserts that before her marriage, Ella knew nothing of Grainger's sado-masochistic interests,[82] in a letter dated 23 April 1928 (four months before the wedding) Grainger writes to her: "As far as my taste goes, blows [with the whip] are most thrilling on breasts, bottom, inner thighs, sexparts". He later adds, "I shall thoroly thoroly [sic] understand if you cannot in any way see yr way to follow up this hot wish of mine".[83] The couple were married on 9 August 1928 at the Hollywood Bowl, at the end of a concert which, in honour of the bride, had included the first performance of Grainger's bridal song "To a Nordic Princess".[9]

[edit] Educator

From the late 1920s and early 1930s Grainger became involved increasingly with educational work in schools and colleges,[9] and in late 1931 accepted a year's appointment for 1932 33 as professor of music at New York University (NYU). In this role he delivered a series of lectures under the heading "A General Study of the Manifold Nature of Music", which introduced his students to a wide range of ancient and modern works.[9] On 25 October 1932 his lecture was illustrated by Duke Ellington and his band, who appeared in person; Grainger admired Ellington's music, seeing harmonic similarities with Delius. On the whole, however, Grainger did not enjoy his tenure at NYU; he disliked the institutional formality, and found the university generally unreceptive to his ideas. Despite many offers he never accepted another formal academic appointment, and refused all offers of honorary degrees.[84][n 5] His New York lectures became the basis for a series of radio talks which he gave for the Australian Broadcasting Commission in 1934 35; these were later summarised and published as *Music: A Commonsense View of All Types*. [2] On 3 and 4 September 1934 Grainger adjudicated at the Sydney Eisteddfod on Sections 10 (Vocal Ensemble) and 45 (String Ensemble) for which he selected and provided the music. In 1937 Grainger began an association with the Interlochen International Music Camp, and taught regularly at its summer schools until 1944.[86]

[edit] Innovator

The idea of establishing a Grainger Museum in Australia had first occurred to Grainger in 1932. He began collecting and recovering from friends letters and artifacts, even those demonstrating the most private aspects of his life,[87] such as whips, bloodstained shirts and revealing photographs.[88] In September 1933 he and Ella went to Australia to begin supervising the building work. To finance the project, Grainger embarked on a series of concerts and broadcasts,[89] in which he subjected his audiences to a vast range of the world's music in accordance with his "universalist" view. Controversially, he argued for the superior achievements of Nordic composers over traditionally recognised masters such as Mozart and Beethoven.[2]

Among various new ideas, Grainger introduced his so-called "free-music" theories. He believed that conformity with the traditional rules of set scales, rhythms and harmonic procedures amounted to "absurd goose-stepping", from which music should be set free.[90] He demonstrated two experimental compositions of free music, performed initially by a string quartet and later by the use of electronic theremins.[8] He believed that ideally, free music required non-human performance, and spent much of his later life developing machines to fulfil this vision.[91]

While the building of the museum proceeded, the Graingers visited England for several months in 1936, during which Grainger made his first BBC broadcast. In this, he conducted "Love Verses from The Song of Solomon" in which the tenor soloist was the then unknown Peter Pears.[92] After spending 1937 in America,

Grainger returned to Melbourne in 1938 for the official opening of the Museum; among those present at the ceremony was his old piano teacher Adelaide Burkitt. The museum did not open to the general public during Grainger's lifetime, but was available to scholars for research.[93][94]

In the late 1930s Grainger spent much time arranging his works in settings for wind bands. He wrote A Lincolnshire Posy for the March 1937 convention of the American Band Masters' Association in Milwaukee,[95] and in 1939, on his last visit to England before the Second World War, he composed "The Duke of Marlborough's Fanfare", giving it the subtitle "British War Mood Grows".[93]

[edit] Later career

[edit] Second World War

The outbreak of war in Europe in September 1939 curtailed Grainger's overseas travelling. In the autumn of 1940, alarmed that the war might precipitate an invasion of the United States eastern seaboard, he and Ella moved to Springfield, Missouri, in the centre of the continent.[96] From 1940 Grainger played regularly in charity concerts, especially after the attack on Pearl Harbor brought the United States into the war in December 1941; the historian Robert Simon calculates that Grainger made a total of 274 charity appearances during the war years, many of them at Army and Air force camps.[94] In 1942 a collection of his Kipling settings, the Jungle Book cycle, was performed in eight cities by the choir of the Gustavus Adolphus College from St. Peter, Minnesota.[97]

[edit] Postwar decline

Exhausted from his wartime concerts routine, Grainger spent much of 1946 on holiday in Europe. He was experiencing a sense of career failure; in 1947, when refusing the Chair of Music at Adelaide University, he wrote: "If I were 40 years younger, and not so crushed by defeat in every branch of music I have essayed, I am sure I would have welcomed such a chance".[98] In January 1948 he conducted the premiere of his wind band setting of "The Power of Rome and the Christian Heart", written for the Goldman Band to celebrate the 70th birthday of its founder. Afterwards, Grainger denigrated his own music as "commonplace" while praising Darius Milhaud's Suite Française, with which it had shared the programme.[99]

On 10 August 1948, Grainger appeared at the London Proms, playing the piano part in his Suite on Danish Folksongs with the London Symphony Orchestra under Basil Cameron. On 18 September he attended the Last Night of the Proms, standing in the promenade section for Delius's Brigg Fair.[100] Over the next few years several friends died: Gardiner in 1950, Quilter and Karen Holten in 1953. In October 1953 Grainger was operated on for abdominal cancer; his fight against this disease would last for the rest of his life.[101] He continued to appear at concerts, often in church halls and educational establishments rather than major concert venues.[9] In 1954, after his last Carnegie Hall appearance, Grainger's long promotion of Grieg's music was recognised when he was awarded the St. Olav Medal by King Haakon of Norway.[102] However, a growing bitterness was becoming evident in his writings and correspondence; in a letter to his lifelong friend, the Danish composer Herman Sandby, he bemoaned the continuing ascendancy in music of the "German form", and asserted that "all my compositional life I have been a leader without followers".[102]

After 1950 Grainger virtually ceased to compose. His principal creative activity in the last decade of his life was his work with Burnett Cross, a young physics teacher, on free music machines. The first of these was a relatively simple device controlled by an adapted pianola.[103] Next was the "Estey-reed tone-tool", a form of giant harmonica which, Grainger expectantly informed his stepdaughter Elsie in April 1951, would be ready to play free music "in a few weeks".[104] A third machine, the "Cross-Grainger Kangaroo-pouch", was completed by 1952. Developments in transistor technology encouraged Grainger and Cross to begin work on a fourth, entirely electronic machine, which was incomplete when Grainger died.[8][103]

In September 1955 Grainger made his final visit to Australia, where he spent nine months organising and arranging exhibits for the Grainger Museum. He

refused to consider a "Grainger Festival", as suggested by the Australian Broadcasting Commission, because he felt that his homeland had rejected him and his music. Before leaving Melbourne, he deposited in a bank a parcel that contained an essay and photographs related to his sex life, not to be opened until 10 years after his death.[105]

[edit] Last years

By 1957 Grainger's physical health had markedly declined, as had his powers of concentration.[106] Nevertheless, he continued to visit Britain regularly; in May of that year he made his only television appearance, in a BBC "Concert Hour" programme when he played "Handel in the Strand" on the piano. Back home, after further surgery he recovered sufficiently to undertake a modest winter concerts season.[107] On his 1958 visit to England he met Benjamin Britten, the two having previously maintained a mutually complimentary correspondence.[108] He agreed to visit Britten's Aldeburgh Festival in 1959, but was prevented by illness. Sensing that death was drawing near, he made a new will, bequeathing his skeleton "for preservation and possible display in the Grainger Museum". This wish was not carried out.[109]

Through the winter of 1959â ^60 Grainger continued to perform his own music, often covering long distances by bus or train; he would not travel by air. On 29 April 1960 he gave his last public concert, at Dartmouth College in Hanover, New Hampshire, although by now his illness was affecting his concentration. On this occasion his morning recital went well, but his conducting in the afternoon was, in his own words, "a fiasco".[110][111] Subsequently confined to his home, he continued to revise his music and arrange that of others; in August he informed Elsie that he was working on an adaptation of one of Cyril Scott's early songs.[112] His last letters, written from hospital in December 1960 and January 1961, record attempts to work, despite failing eyesight and hallucinations: "I have been trying to write score for several days. But I have not succeeded yet." [113]

Grainger died in the White Plains hospital on 20 February 1961, at the age of 78. His body was flown to Adelaide where, on 2 March, he was buried in the Aldridge family vault in the West Terrace Cemetery, alongside Rose's ashes.[8] Ella survived him by 18 years; in 1972, aged 83, she married a young archivist, Stewart Manville. She died at White Plains on 17 July 1979.[2][114]

Grainger's own works fall into two categories: original compositions and folk music arrangements. Besides these, he wrote many settings of other composers' works.[8][9] Despite his conservatory training he rebelled against the disciplines of the central European tradition, largely rejecting conventional forms such as symphony, sonata, concerto and opera. With few exceptions his original compositions are miniatures, lasting between two and eight minutes. Only a few of his works originated as piano pieces, though in due course almost all of them were, in his phrase, "dished up" in piano versions.[9]

The conductor John Eliot Gardiner describes Grainger as "a true original in terms of orchestration and imaginative instrumentation", whose terseness of expression is reminiscent in style both of the 20th century Second Viennese School and the Italian madrigalists of the 16th and 17th centuries.[115] Malcolm Gillies, a Grainger scholar, writes of Grainger's style that "you know it is 'Grainger' when you have heard about one second of a piece".[116] The music's most individual characteristic, Gillies argues, is its texture â ^ "the weft of the fabric", according to Grainger.[117] Different textures are defined by Grainger as "smooth", "grained" and "prickly".[9]

Grainger was a musical democrat; he believed that in a performance each player's role should be of equal importance. His elastic scoring technique was developed to enable groups of all sizes and combinations of instruments to give effective performances of his music. Experimentation is evident in Grainger's earliest works; irregular rhythms based on rapid changes of time signature were employed in Love Verses from "The Song of Solomon" (1899), and Train Music (1901), long before Stravinsky adopted this practice.[4] In search of specific sounds Grainger employed unconventional instruments and techniques: solovoxes, theremins, marimbas, musical glasses, harmoniums, banjos, and

ukuleles.[109][118] In one early concert of folk music, Quilter and Scott were conscripted as performers, to whistle various parts.[119] In "Random Round" (1912â ^14), inspired by the communal music-making he had heard in the Pacific Islands on his second Australasian tour, Grainger introduced an element of chance into performances; individual vocalists and instrumentalists could make random choices from a menu of variations.[9] This experiment in "aleatory" composition presaged by many decades the use of similar procedures by avant-garde composers such as Berio and Stockhausen.[120]

The brief "Sea Song" of 1907 was an early attempt by Grainger to write "beatless" music. This work, initially set over 14 irregular bars and occupying about 15 seconds of performing time,[121] was a forerunner of Grainger's free music experiments of the 1930s. Grainger wrote: "It seems to me absurd to live in an age of flying, and yet not be able to execute tonal glides and curves". The idea of tonal freedom, he said, had been in his head since as a boy of eleven or twelve he had observed the wave-movements in the sea. "Out in nature we hear all kinds of lovely and touching "free" (non-harmonic) combinations of tones; yet we are unable to take up these beauties ... into the art of music because of our archaic notions of harmony".[90] In a 1941 letter to Scott, Grainger acknowledged that he had failed to produce any large-scale works in the manner of a Bach oratorio, a Wagner opera or a Brahms symphony, but excused this failure on the grounds that all his works prior to the mid-1930s had been mere preparations for his free music.[122]

As a student, Grainger had learned to appreciate the music of Grieg, and came to regard the Norwegian as a paragon of Nordic beauty and greatness. Grieg in turn described Grainger as a new way forward for English composition, "quite different from Elgar, very original". After a lifetime interpreting Grieg's works, in 1944 Grainger began adapting the Norwegian's E minor Piano Sonata, Op. 7 as a "Grieg-Grainger Symphony", but abandoned the project after writing 16 bars of music. By this time, Grainger acknowledged that he had not fulfilled Grieg's high expectations of him, either as a composer or as a pianist. He also reflected on whether it would have been better, from the point of view of his development as a composer, had he never met the Griegs, "sweet and dear though they were to me".[123]

Grainger was known for his musical experimentation and did not hesitate to exploit the capabilities of the orchestra. Train Music was intended for 150 players and Country Gardens has some lush harmonic invention. Perhaps his most ambitious work was The Warriors, an 18 minute 'imaginary ballet' of frenzied 'danceable music', entrusted to a huge orchestral ensemble incorporating a large 'tuneful percussion' mixture alongside at least three pianos â ^ in one performance, Grainger used nineteen pianos with thirty pianists â ^ to be played by "exceptionally strong vigorous players".[124]

[edit] Legacy

Grainger considered himself an Australian composer who, he said, wrote music "in the hopes of bringing honor and fame to my native land".[125] However, much of Grainger's working life was spent elsewhere, and the extent to which he influenced Australian music, within his lifetime and thereafter, is debatable.[126] His efforts to educate the Australian musical public in the mid-1930s were indifferently received, and did not attract disciples;[127] writing in 2010, the academic and critic Roger Covell identifies only one significant contemporary Australian musician â ^ the English-born horn player, pianist and conductor David Stanhope â ^ working in the Grainger idiom.[126] In 1956, the suggestion by the composer Keith Humble that Grainger be invited to write music for the opening of the 1956 Summer Olympics in Melbourne had been rejected by the organisers of the Games.[105]

Grainger was a life-long atheist and believed he would only endure in the body of work he left behind.[128] He took an unusual course of action to ensure that survival by establishing a personal museum dedicated to his own life. The Grainger Museum was given little attention before the mid-1970s;[9] it was initially regarded as evidence either of an over-large ego or of extreme eccentricity.[129] Since then the University of Melbourne's commitment to the

museum has, Covell asserts, "rescued [it] permanently from academic denigration and belittlement".[129] Its vast quantities of materials have been used to investigate not only Grainger's life and works, but those of contemporaries whom Grainger had known: Grieg, Delius, Scott and others.[130] The Grainger home at 7 Cromwell Place, White Plains, is now the Percy Grainger Library and is a further repository of memorabilia and historic performance material, open to researchers and visitors.[9][131]

In Britain, Grainger's main legacy is the revival of interest in folk music. His pioneering work in the recording and setting of folksongs greatly influenced the following generation of English composers; Benjamin Britten acknowledged the Australian as his master in this respect.[132] After hearing a broadcast of some Grainger settings, Britten reportedly declared that these "[knocked] all the Vaughan Williams and R. O. Morris arrangements into a cocked hat".[133] In the United States, Grainger left a strong educational legacy through his involvement, over 40 years, with high school, summer school and college students. Likewise, his innovative approaches to instrumentation and scoring have left their mark on modern American band music;[9] Timothy Reynish, a conductor and teacher of band music in Europe and America, has described him as "the only composer of stature to consider military bands the equal, if not the superior, in expressive potential to symphony orchestras." [134] Grainger's attempts to produce "free music" by mechanical and later electronic means, which he considered his most important work, produced no follow-up; they were quickly overtaken and nullified by new technological advances. Covell nevertheless remarks that in this endeavour, Grainger's dogged resourcefulness and ingenious use of available materials demonstrate a particularly Australian aspect of the composer's character â ^ one of which Grainger would have been proud.[135]

[edit] Assessment

In 1945 Grainger devised an informal ratings system for composers and musical styles, based on criteria that included originality, complexity and beauty. Of forty composers and styles, he ranked himself equal ninth â ^ behind Wagner and Delius, but well ahead of Grieg and Tchaikovsky.[123] Nevertheless, in his later years he frequently denigrated his career, for example writing to Scott: "I have never been a true musician or true artist".[136] His failure to be recognised as a composer for anything beyond his popular folk-song arrangements was a source of frustration and disappointment;[137] for years after his death the bulk of his output remained largely unperformed.[138] From the 1990s an increase in the number of Grainger recordings has brought a revival of interest in his works, and has enhanced his reputation as a composer.[2] An unsigned tribute published on the Gramophone website in February 2011 to commemorate the 50th anniversary of Grainger's death opined that "though he would never be put on a pedestal to join the pantheon of immortals, he is unorthodox, original and deserves better than to be dismissed by the more snooty arbiters of musical taste".[109]

Of Grainger the pianist, The New York Times critic Harold Schonberg wrote that his unique style was expressed with "amazing skill, personality and vigor".[139] The early enthusiasm which had greeted his concert appearances became muted in later years, and reviews of his performances during the final ten years of his life were often harsh.[140] However, Britten regarded Grainger's late recording of the Grieg concerto, from a live performance at Aarhus in 1957, as "one of the noblest ever committed to record" â ^ despite the suppression of the disc for many years, because of the proliferation of wrong notes and other faults.[141] Brian Allison from the Grainger Museum, referring to Grainger's early displays of artistic skills, has speculated that had John Grainger's influence not been removed, "Percy Aldridge Grainger may today be remembered as one of Australia's leading painters and designers, who just happened to have a latent talent as a pianist and composer".[142] The ethnomusicologist John Blacking, while acknowledging Grainger's contribution to social and cultural aspects of music, nevertheless writes that if the continental foundation of Grainger's musical education had not been "undermined

by dilettantism and the disastrous influence of his mother, I am sure that his ultimate contribution to the world of music would have been much greater".[143]

[edit] Recordings

Between 1908 and 1957 Grainger made numerous recordings, usually as pianist or conductor, of his own and other composers' music. His first recordings, for The Gramophone Company Ltd (later HMV), included the cadenza to Grieg's piano concerto; he did not record a complete version of this work on disc until 1945. Much of his recording work was done between 1917 and 1931, under contract with Columbia. At other times he recorded for Decca (1944â ^45 and 1957), and Vanguard (1957). Of his own compositions and arrangements, "Country Gardens", "Shepherd's Hey" and "Molly on the Shore" were recorded most frequently; in recordings of other composers, piano works by Bach, Brahms, Chopin, Grieg, Liszt and Schumann figure most often.[144] Grainger's complete 78 rpm solo piano recordings are now available on compact disc as a CD box set on APR records in transfers made by Ward Marston.[145] During his association with the Duo-Art company between 1915 and 1932, Grainger made around 80 piano rolls of his own and others' music, many of which have subsequently been transferred to CD, using a wooden robot designed to play a concert grand piano via an array of precision mechanical fingers and feet.[146][147][148] This reproduction system allowed Grainger to make a posthumous appearance in the Albert Hall, London, during the 1988 last night of the Proms as soloist with the BBC Symphony Orchestra in Grieg's Piano Concerto.[149]

Since Grainger's death, recordings of his works have been undertaken by many artists and issued under many different labels. In 1995 Chandos Records began to compile a complete recorded edition of Grainger's original compositions and folk settings.[150] Of 25 anticipated volumes, 19 had been completed as of 2010;[151] these were issued as a CD boxed set in 2011, to mark the 50th anniversary of the composer's death.[152]

[edit] Media portrayals

Percy Grainger has been portrayed on screen more than once. In *Song of Summer*, a 1968 Ken Russell film mainly about Frederick Delius and Eric Fenby, he was played by David Collings. *Passion* (also known as *Passion: The Story of Percy Grainger*) was a 1999 Australian biopic about some episodes in Grainger's life during the early part of his career. It starred Richard Roxburgh as the composer and Barbara Hershey as Rose Grainger.

[edit] Notes and references

Notes

^ Although most sources give 1855 as the birth year, the Grainger Museum states that 1854 is the correct year.[1]

^ The correspondence was conducted largely in Danish, at which Grainger was fluent. His first letter to Holten, dated 12 August 1905, begins "Dear Miss Holten"; by the end of the year she is "My dear Karen". During their long separations Grainger's letters become a diary of his activities.[44]

^ There is no evidence up to this time that Grainger could play the saxophone,[53] but in an official listing of the band's personnel as of April 1918 he is listed as a saxophone soloist.[54]

^ Some of Grainger's earliest published letters contain anti-Semitic comments, for example to Karen Holten in 1905.[77] He later asserted that the Jewish race was less capable of producing good music than the Nordic races,[78] and his letter to Quilter of 25 February 1939 is cited by Gillies and Pear as an example of his racial intolerance.[76][79]

^ In April 1945 Grainger declined an honorary doctorate from McGill University in Montreal, on the grounds that having had only three months' formal schooling, his music "must be regarded as a product of non-education".[85]

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^ Bird, pp. 20â ^22

^ Bird, p. 23

^ Bird, pp. 24â ^25

^ a b c Scott, pp. 51â ^54

^ Bird, pp. 26â ^29

^ Bird, p. 35

^ a b c Bird, pp. 39â ^41

^ a b Bird, pp. 42â ^43

^ Bird, pp. 63â ^65

^ Bird, pp. 66 and 73

^ Pear ("Grainger: The Formative Years"), p. 6

^ Bird, p. 69

^ Bird, p. 81

^ Bird, pp. 83â ^88

^ a b Thwaites (ed.) p. xx

^ Dreyfus (ed.), p. 2

^ Bird, p. 79

^ a b c Simon, pp. 5â ^6

^ Tall, pp. 55â ^56

^ Bird, p. 102

^ a b Carley, pp. 33â ^34

^ Palmer, pp. 79â ^82

^ Carley, pp. 49â ^50

^ Bird, p. 116

^ a b Gillies, Malcolm; Pear, David (Autumn 2007). "Great Expectations: Grieg and Granger". *The Musical Times* 148 (1900): pp. 7â ^9.

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^ Tall, p. 63

^ Ould, p. 26

^ Thwaites (ed.), p. xxi

^ Bird, p. 144

^ Dreyfus, pp. 454, 458

^ Bird, p. 147

^ Dreyfus, p. xiv

^ Dreyfus, pp. 47, 54, 55 and others

^ a b Bird, pp. 148â ^49

^ Dreyfus, p. 492

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^ Gillies and Pear (eds), p. 13

^ Bird, p. 152

^ Gillies and Pear (eds), pp. 35â ^39
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 ^ Bird, p. 158
 ^ Bird, p. 159
 ^ Gillies and Pear (eds), pp. 132â ^33
 ^ Gillies and Pear (eds), pp. 39â ^40
 ^ Foreman ("Miscellaneous Works"), pp. 137â ^38
 ^ a b Simon, p. 7
 ^ Gillies and Pear (eds), p. xv
 ^ Bird, p. 162
 ^ Tan, p. 15
 ^ Bird, pp. 167â ^68
 ^ Gillies and Pear (eds), p. xv
 ^ Bird, p. 166
 ^ Bird, pp. 163â ^64
 ^ Fairfax, pp. 75â ^77
 ^ Bird, p. 170
 ^ Gillies and Pear (eds), p. 52
 ^ Bird, pp. 173â ^74
 ^ Bird, p. 175
 ^ Fenby, pp. 74â ^75
 ^ Bird, p. 183
 ^ Simon, p. 9
 ^ Ould, p. 25
 ^ Bird, pp. 279â ^81
 ^ Bird, p. 53. See also Gillies and Pear (eds), p. 107
 ^ a b Gillies and Pear (eds), pp. 4â ^6
 ^ Dreyfus (ed.), p. 54
 ^ Pear ("Grainger the Social Commentator"), p. 36
 ^ Gillies and Pear (eds), pp. 156â ^63
 ^ Bird, pp. 194â ^96
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 ^ Gillies and Pear (eds), pp. 197â ^98
 ^ Bird, p. 213
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 ^ a b Statement by Percy Grainger entitled "Free Music", dated 6 December 1938, in Thwaites (ed.), pp. 207â ^08
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 ^ a b Bird, pp. 214â ^15
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 ^ Gillies and Pear (eds), pp. 266â ^67
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 ^ Lloyd, p. 21
 ^ Reynish, p. 20
 ^ Covell, p. 148
 ^ Gillies and Pear (eds), p. 255
 ^ Pear ("Grainger the Social Commentator"), p. 32
 ^ Ould, p. 29
 ^ Quoted by Bird, pp. 100â ^01, from Schonberg, Harold (1964): The Great Pianists, London, Victor Gollancz
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[edit] External links

Persondata

Name

Grainger, Percy

Alternative names

Short description

Australian-born composer

Date of birth

8 July 1882

Place of birth

Brighton, Melbourne

Date of death

20 February 1961

Place of death

White Plains, New York

Kitsune (𐆑 1?, IPA:Â [kitsÉˈne]Â (listen)) is the Japanese word for fox. Foxes are a common subject of Japanese folklore; in English, kitsune refers to them in this context. Stories depict them as intelligent beings and as possessing magical abilities that increase with their age and wisdom. Foremost among these is the ability to assume human form. While some folktales speak of kitsune employing this ability to trick othersâ ~as foxes in folklore often doâ ~other stories portray them as faithful guardians, friends, lovers, and wives.

Foxes and human beings lived close together in ancient Japan; this companionship gave rise to legends about the creatures. Kitsune have become closely associated with Inari, a Shinto kami or spirit, and serve as its messengers. This role has reinforced the fox's supernatural significance. The more tails a kitsune hasâ ~they may have as many as nineâ ~the older, wiser, and more powerful it is. Because of their potential power and influence, some people make offerings to them as to a deity.

[edit] Origins

It is widely agreed that many fox myths in Japan can be traced to China, Korea, or India. Chinese folk tales tell of fox spirits called huli jing that may have up to nine tails, or KyÂ«bi no Kitsune in Japanese. Many of the earliest surviving stories are recorded in the Konjaku Monogatari, an 11th-century collection of Chinese, Indian, and Japanese narratives.[1]

There is debate whether the kitsune myths originated entirely from foreign sources or are in part an indigenous Japanese concept dating as far back as the fifth century BC. Japanese folklorist Kiyoshi Nozaki argues that the Japanese

regarded kitsune positively as early as the 4th century A.D.; the only things imported from China or Korea were the kitsune's negative attributes.[2] He states that, according to a 16th-century book of records called the Nihon Ryakki, foxes and human beings lived close together in ancient Japan, and he contends that indigenous legends about the creatures arose as a result.[3] Inari scholar Karen Smyers notes that the idea of the fox as seductress and the connection of the fox myths to Buddhism were introduced into Japanese folklore through similar Chinese stories, but she maintains that some fox stories contain elements unique to Japan.[4]

[edit] Etymology

The full etymology is unknown. The oldest known usage of the word is in the 794 text Shin'yaku Kogonkyō Ongi Shiki. Other old sources include Nihon Ryōiki (810-824) and Wamyō Ruijushō (c. 934). These oldest sources are written in Man'yōgana which clearly identifies the historical spelling as kiltune. Following several diachronic phonological changes, this becomes kitsune.

Many etymological suggestions have been made, though there is no general agreement:

Myōgoki (1268) suggests that it is so called because it is "always (tsune) yellow (ki)".

Early Kamakura period Mizukagami indicates that it means "came (ki) [perfective aspect particle tsu] to bedroom (ne)" due to a legend that a kitsune would change into one's wife and bear children.

Arai Hakuseki in Tōga (1717) suggests that ki means "stench", tsu is a possessive particle, and ne is related to inu, the word for "dog".

Tanikawa Kotosuga in Wakun no Shiori (1777-1887) suggests that ki means "yellow", tsu is a possessive particle, and ne is related to neko, the word for cat.

Ōtsuki Fumihiko in Daigenkai (1932-1935) proposes that kitsu is an onomatopoeia for the animal, and that ne is an affix or an honorific word meaning a servant of an Inari shrine.

According to Nozaki, the word kitsune was originally onomatopoeic.[3] Kitsu represented a fox's yelp and came to be the general word for fox. -Ne signifies an affectionate mood, which Nozaki presents as further evidence of an established, non-imported tradition of benevolent foxes in Japanese folklore.[2] Kitsu is now archaic; in modern Japanese, a fox's cry is transcribed as kon kon or gon gon.

One of the oldest surviving kitsune tales provides a widely known folk etymology of the word kitsune.[5] Unlike most tales of kitsune who become human and marry human males, this one does not end tragically:[6][7]

Ono, an inhabitant of Mino (says an ancient Japanese legend of A.D. 545), spent the seasons longing for his ideal of female beauty. He met her one evening on a vast moor and married her. Simultaneously with the birth of their son, Ono's dog was delivered of a pup which as it grew up became more and more hostile to the lady of the moors. She begged her husband to kill it, but he refused. At last one day the dog attacked her so furiously that she lost courage, resumed vulpine shape, leaped over a fence and fled.

"You may be a fox," Ono called after her, "but you are the mother of my son and I love you. Come back when you please; you will always be welcome."

So every evening she stole back and slept in his arms.[5]

Because the fox returns to her husband each night as a woman but leaves each morning as a fox, she is called Kitsune. In classical Japanese, kitsu-ne means come and sleep, and ki-tsune means always comes.[7]

[edit] Characteristics

Kitsune are believed to possess superior intelligence, long life, and magical powers. They are a type of yōkai, or spiritual entity, and the word kitsune is often translated as fox spirit. However, this does not mean that kitsune are ghosts, nor that they are fundamentally different from regular foxes. Because

the word spirit is used to reflect a state of knowledge or enlightenment, all long-lived foxes gain supernatural abilities.[4]

There are two common classifications of kitsune. The zenko (zenko, literally good foxes) are benevolent, celestial foxes associated with the god Inari; they are sometimes simply called Inari foxes. On the other hand, the yako (yako, literally field foxes, also called nogitsune) tend to be mischievous or even malicious.[8] Local traditions add further types.[9] For example, a ninko is an invisible fox spirit that human beings can only perceive when it possesses them. Another tradition classifies kitsune into one of thirteen types defined by which supernatural abilities the kitsune possesses.

Physically, kitsune are noted for having as many as nine tails.[10] Generally, a greater number of tails indicates an older and more powerful fox; in fact, some folktales say that a fox will only grow additional tails after it has lived 100 years.[11] One, five, seven, and nine tails are the most common numbers in folk stories.[12] When a kitsune gains its ninth tail, its fur becomes white or gold.[10] These kyūbi no kitsune (kyūbi no kitsune, nine-tailed foxes) gain the abilities to see and hear anything happening anywhere in the world. Other tales attribute them infinite wisdom (omniscience).[13]

[edit] Shapeshifting

A kitsune may take on human form, an ability learned when it reaches a certain age—usually 100 years, although some tales say 50.[11] As a common prerequisite for the transformation, the fox must place reeds, a broad leaf, or a skull over its head.[14] Common forms assumed by kitsune include beautiful women, young girls, or elderly men. These shapes are not limited by the fox's age or gender,[4] and a kitsune can duplicate the appearance of a specific person.[15] Foxes are particularly renowned for impersonating beautiful women. Common belief in medieval Japan was that any woman encountered alone, especially at dusk or night, could be a fox.[16] Kitsune-gao or fox-faced refers to human females who have a narrow face with close-set eyes, thin eyebrows, and high cheekbones. Traditionally, this facial structure is considered attractive, and some tales ascribe it to foxes in human form.[17] Variants on the theme have the kitsune retain other foxlike traits, such as a coating of fine hair, a fox-shaped shadow, or a reflection that shows its true form.[18]

In some stories, kitsune have difficulty hiding their tails when they take human form; looking for the tail, perhaps when the fox gets drunk or careless, is a common method of discerning the creature's true nature.[19] A particularly devout individual may in some cases even be able to see through a fox's disguise merely by perceiving them.[20] Kitsune may also be exposed while in human form by their fear and hatred of dogs, and some become so rattled by their presence that they revert to the form of a fox and flee.

One folk story illustrating these imperfections in the kitsune's human shape concerns Koan, a historical person credited with wisdom and magical powers of divination. According to the story, he was staying at the home of one of his devotees when he scalded his foot entering a bath because the water had been drawn too hot. Then, "in his pain, he ran out of the bathroom naked. When the people of the household saw him, they were astonished to see that Koan had fur covering much of his body, along with a fox's tail. Then Koan transformed in front of them, becoming an elderly fox and running away." [21]

Other supernatural abilities commonly attributed to the kitsune include possession, mouths or tails that generate fire or lightning (known as kitsune-bi; literally, fox-fire), willful manifestation in the dreams of others, flight, invisibility, and the creation of illusions so elaborate as to be almost indistinguishable from reality.[14][18] Some tales speak of kitsune with even greater powers, able to bend time and space, drive people mad, or take fantastic shapes such as a tree of incredible height or a second moon in the sky.[22][23] Other kitsune have characteristics reminiscent of vampires or succubi and feed on the life or spirit of human beings, generally through sexual contact.[24]

[edit] Kitsunetsuki

Kitsunetsuki (kitsunetsuki or kitsune-tsuki; also written kitsune-tsuki) literally means

the state of being possessed by a fox. The victim is always a young woman, whom the fox enters beneath her fingernails or through her breasts.[25] In some cases, the victims' facial expressions are said to change in such a way that they resemble those of a fox. Japanese tradition holds that fox possession can cause illiterate victims to temporarily gain the ability to read.[26] Though foxes in folklore can possess a person of their own will, Kitsunetsuki is often attributed to the malign intents of hereditary fox employers, or tsukimono-suji.[27]

Folklorist Lafcadio Hearn describes the condition in the first volume of his *Glimpses of Unfamiliar Japan*:

Strange is the madness of those into whom demon foxes enter. Sometimes they run naked shouting through the streets. Sometimes they lie down and froth at the mouth, and yelp as a fox yelps. And on some part of the body of the possessed a moving lump appears under the skin, which seems to have a life of its own. Prick it with a needle, and it glides instantly to another place. By no grasp can it be so tightly compressed by a strong hand that it will not slip from under the fingers. Possessed folk are also said to speak and write languages of which they were totally ignorant prior to possession. They eat only what foxes are believed to like—tôfu, aburagô, azukimeshi, etc.—and they eat a great deal, alleging that not they, but the possessing foxes, are hungry.[28]

He goes on to note that, once freed from the possession, the victim will never again be able to eat tofu, azukimeshi, or other foods favored by foxes:

Exorcism, often performed at an Inari shrine, may induce a fox to leave its host.[29] In the past, when such gentle measures failed or a priest was not available, victims of kitsunetsuki were beaten or badly burned in hopes of forcing the fox to leave. Entire families were ostracized by their communities after a member of the family was thought to be possessed.[28]

In Japan, kitsunetsuki was noted as a disease as early as the Heian period and remained a common diagnosis for mental illness until the early 20th century.[30][31] Possession was the explanation for the abnormal behavior displayed by the afflicted individuals. In the late 19th century, Dr. Shunichi Shimamura noted that physical diseases that caused fever were often considered kitsunetsuki.[32] The belief has lost favor, but stories of fox possession still occur, such as allegations that members of the Aum Shinrikyo cult had been possessed.[33]

In medicine, kitsunetsuki is a culture-bound syndrome unique to Japanese culture. Those who suffer from the condition believe they are possessed by a fox.[34] Symptoms include cravings for rice or sweet red beans, listlessness, restlessness, and aversion to eye contact. Kitsunetsuki is similar to but distinct from clinical lycanthropy.[35]

[edit] Hoshi no tama (星の玉) (hoshi = star, tama = ball)

Depictions of kitsune or their possessed victims may feature round or onion-shaped white balls known as hoshi no tama (star balls). Tales describe these as glowing with kitsune-bi, or fox-fire.[36] Some stories identify them as magical jewels or pearls.[37] When not in human form or possessing a human, a kitsune keeps the ball in its mouth or carries it on its tail.[11] Jewels are a common symbol of Inari, and representations of sacred Inari foxes without them are rare.[38]

One belief is that when a kitsune changes shape, its hoshi no tama holds a portion of its magical power. Another tradition is that the pearl represents the kitsune's soul; the kitsune will die if separated from it for long. Those who obtain the ball may be able to extract a promise from the kitsune to help them in exchange for its return.[39] For example, a 12th-century tale describes a man using a fox's hoshi no tama to secure a favor:

"Confound you!" snapped the fox. "Give me back my ball!" The man ignored its

pleas till finally it said tearfully, "All right, you've got the ball, but you don't know how to keep it. It won't be any good to you. For me, it's a terrible loss. I tell you, if you don't give it back, I'll be your enemy forever. If you do give it back though, I'll stick to you like a protector god."

The fox later saves his life by leading him past a band of armed robbers.[40]

[edit] Portrayal

[edit] Servants of Inari

Kitsune are associated with Inari, the Shinto deity of rice.[41] This association has reinforced the fox's supernatural significance.[42] Originally, kitsune were Inari's messengers, but the line between the two is now blurred so that Inari itself may be depicted as a fox. Likewise, entire shrines are dedicated to kitsune, where devotees can leave offerings.[9] Fox spirits are said to be particularly fond of a fried sliced tofu called aburage, which is accordingly found in the noodle-based dishes kitsune udon and kitsune soba. Similarly, Inari-zushi is a type of sushi named for Inari that consists of rice-filled pouches of fried tofu.[43] There is speculation among folklorists as to whether another Shinto fox deity existed in the past. Foxes have long been worshipped as kami.[44]

Inari's kitsune are white, a color of good omen.[9] They possess the power to ward off evil, and they sometimes serve as guardian spirits. In addition to protecting Inari shrines, they are petitioned to intervene on behalf of the locals and particularly to aid against troublesome nogitsune, those spirit foxes who do not serve Inari. Black foxes and nine-tailed foxes are likewise considered good omens.[19]

According to beliefs derived from fusui (feng shui), the fox's power over evil is such that a mere statue of a fox can dispel the evil kimon, or energy, that flows from the northeast. Many Inari shrines, such as the famous Fushimi Inari shrine in Kyoto, feature such statues, sometimes large numbers of them.

Kitsune are connected to the Buddhist religion through the Dakiniten, goddesses conflated with Inari's female aspect. Dakiniten is depicted as a female bodhisattva wielding a sword and riding a flying white fox.[45]

[edit] Tricksters

Kitsune are often presented as tricksters, with motives that vary from mischief to malevolence. Stories tell of kitsune playing tricks on overly proud samurai, greedy merchants, and boastful commoners, while the crueler ones abuse poor tradesmen and farmers or devout Buddhist monks. Their victims are usually men; women are possessed instead.[16] For example, kitsune are thought to employ their kitsune-bi or fox-fire to lead travelers astray in the manner of a will o' the wisp.[46][47] Another tactic is for the kitsune to confuse its target with illusions or visions.[16] Other common goals of trickster kitsune include seduction, theft of food, humiliation of the prideful, or vengeance for a perceived slight.

A traditional game called kitsune-ken (fox-fist) references the kitsune's powers over human beings. The game is similar to rock, paper, scissors, but the three hand positions signify a fox, a hunter, and a village headman. The headman beats the hunter, whom he outranks; the hunter beats the fox, whom he shoots; the fox beats the headman, whom he bewitches.[48][49]

This ambiguous portrayal, coupled with their reputation for vengefulness, leads people to try to discover a troublesome fox's motives. In one case, the 16th-century leader Toyotomi Hideyoshi wrote a letter to the kami Inari:

To Inari Daimyojin,

My lord, I have the honor to inform you that one of the foxes under your jurisdiction has bewitched one of my servants, causing her and others a great deal of trouble. I have to request that you make minute inquiries into the matter, and endeavor to find out the reason of your subject misbehaving in this way, and let me know the result.

If it turns out that the fox has no adequate reason to give for his behavior, you are to arrest and punish him at once. If you hesitate to take action in this matter I shall issue orders for the destruction of every fox in the land. Any other particulars that you may wish to be informed of in reference to what has occurred, you can learn from the high priest of Yoshida.[50]

Kitsune keep their promises and strive to repay any favor. Occasionally a kitsune attaches itself to a person or household, where they can cause all sorts of mischief. In one story from the 12th century, only the homeowner's threat to exterminate the foxes convinces them to behave. The kitsune patriarch appears in the man's dreams:

"My father lived here before me, sir, and by now I have many children and grandchildren. They get into a lot of mischief, I'm afraid, and I'm always after them to stop, but they never listen. And now, sir, you're understandably fed up with us. I gather that you're going to kill us all. But I just want you to know, sir, how sorry I am that this is our last night of life. Won't you pardon us, one more time? If we ever make trouble again, then of course you must act as you think best. But the young ones, sir ~ I'm sure they'll understand when I explain to them why you're so upset. We'll do everything we can to protect you from now on, if only you'll forgive us, and we'll be sure to let you know when anything good is going to happen!"[51]

Other kitsune use their magic for the benefit of their companion or hosts as long as the human beings treat them with respect. As y   kai, however, kitsune do not share human morality, and a kitsune who has adopted a house in this manner may, for example, bring its host money or items that it has stolen from the neighbors. Accordingly, common households thought to harbor kitsune are treated with suspicion.[52] Oddly, samurai families were often reputed to share similar arrangements with kitsune, but these foxes were considered zenko and the use of their magic a sign of prestige.[53] Abandoned homes were common haunts for kitsune.[16] One 12th-century story tells of a minister moving into an old mansion only to discover a family of foxes living there. They first try to scare him away, then claim that the house "has been ours for many years, and . . . we wish to register a vigorous protest." The man refuses, and the foxes resign themselves to moving to an abandoned lot nearby.[54]

Tales distinguish kitsune gifts from kitsune payments. If a kitsune offers a payment or reward that includes money or material wealth, part or all of the sum will consist of old paper, leaves, twigs, stones, or similar valueless items under a magical illusion.[55][56] True kitsune gifts are usually intangibles, such as protection, knowledge, or long life.[56]

[edit] Wives and lovers

Kitsune are commonly portrayed as lovers, usually in stories involving a young human male and a kitsune who takes the form of a human woman.[57] The kitsune may be a seductress, but these stories are more often romantic in nature.[58] Typically, the young man unknowingly marries the fox, who proves a devoted wife. The man eventually discovers the fox's true nature, and the fox-wife is forced to leave him. In some cases, the husband wakes as if from a dream, filthy, disoriented, and far from home. He must then return to confront his abandoned family in shame.

Many stories tell of fox-wives bearing children. When such progeny are human, they possess special physical or supernatural qualities that often pass to their own children.[19] The astrologer-magician Abe no Seimei was reputed to have inherited such extraordinary powers.[59]

Other stories tell of kitsune marrying one another. Rain falling from a clear sky ~ a sunshower ~ is called kitsune no yomeiri or the kitsune's wedding, in reference to a folktale describing a wedding ceremony between the creatures being held during such conditions.[60] The event is considered a good omen, but the kitsune will seek revenge on any uninvited guests,[61] as is depicted in Akira Kurosawa's film Dreams.[62]

Stephen Turnbull, in "Nagashino 1575", relates the tale of the Takeda clan's involvement with a fox-woman. The warlord Takeda Shingen, in 1544, defeated in battle a lesser local warlord named Suwa Yorishige and drove him to suicide after a "humiliating and spurious" peace conference, after which Shingen forced marriage on Suwa Yorishige's beautiful 14-year-old daughter Lady Koi~Shingen's own niece. Shingen, Turnbull writes, "was so obsessed with the girl that his superstitious followers became alarmed and believed her to be an incarnation of the white fox-spirit of the Suwa Shrine, who had bewitched him in order to gain revenge." When their son Takeda Katsuyori proved to be a disastrous leader and led the clan to their devastating defeat at the battle of Nagashino, Turnbull writes, "wise old heads nodded, remembering the unhappy circumstances of his birth and his magical mother".

[edit] In fiction

Embedded in Japanese folklore as they are, kitsune appear in numerous Japanese works. Noh, kyogen, bunraku, and kabuki plays derived from folk tales feature them,[63][64] as do contemporary works such as anime, manga and video games. In fact, Luigi's White Tannoki outfit is known as "White Kitsune Luigi." Such well-known fictional Kitsune include the fox demon Kurama from Yu Yu Hakusho and Naruto, and Miles "Tails" Prower from Sonic the Hedgehog series. The Pok mon characters Vulpix and Ninetales, Zorua and Zoroark, and Fennekin are based on the kitsune. Also, Crazy Redd from the Animal Crossing series is based off of the kitsune as well. Western authors of fiction have begun to make use of the kitsune legends.[65] In Å kami, there is is a group of demons called the Pot Foxes which are found inside the Water Dragon. These are based off of Kitsune. Also in Okami is the Demon Lord Ninetails, who possesses nine tails and is also a kitsune, being the lord of Ryoshima. Although these portrayals vary considerably, kitsune are generally depicted in accordance with folk stories, as wise, cunning, and powerful beings.

Kitsune appear in the novel series The Vampire Diaries the two most notable ones are Shinichi and Misao.

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 ^ Addiss, Stephen. *Japanese Ghosts & Demons: Art of the Supernatural*. New York: G. Braziller, 1985. 137
 ^ Hall. *Half Human*. 142
 ^ Nozaki. Kitsune. 230
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 ^ Hall. *Half Human*. 137; the Yoshida priest in question was Yoshida Kanemi (1535â ^1610), then head priest at the Yoshida Shrine in Kyoto.
 ^ Tyler 114â ^5.
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[edit] External links

Stanley Owen Green (22 February 1915 â ^ 4 December 1993), known as the Protein Man, was a human billboard who became a well-known figure in London, England, during the latter half of the 20thÃ© century.[1]

For 25 years Green patrolled Oxford Street in the West End, carrying a placard that advocated "Less Lust, By Less Protein: Meat Fish Bird; Egg Cheese; Peas Beans; Nuts. And Sitting," though the wording â ^ and punctuation â ^ changed slightly over the years. Arguing that protein made people lustful and aggressive, his solution was "protein wisdom," a low-protein diet for "better, kinder, happier people." For a few pence, passers-by could purchase his 14-page pamphlet, *Eight Passion Proteins with Care*, which reportedly sold 87,000 copies over 20 years, its front cover observing, "This booklet would benefit more, if it were read occasionally." [2]

Green became one of London's much-loved eccentrics, though his campaign to suppress desire, as one commentator put it, was not invariably popular, leading to two arrests for obstruction and the need to wear green overalls to protect himself from spit. He nevertheless took great delight in his local fame. The *Sunday Times* interviewed him in 1985, and his "less passion, less protein" slogan was used by Red or Dead, the London fashion house. When he died at the age of 78, The *Daily Telegraph*, The *Guardian* and The *Times* published his obituary, and his pamphlets, placards and letters were passed to the Museum of London. David McKie writes that in 2006 Green achieved what no other human billboard has, an entry in the *Oxford Dictionary of National Biography*. [1]

[edit] Early life

Green was born in Harringay, north London, the youngest of four sons of Richard Green, a clerk for a bottle stopper manufacturer, and his wife, May. He attended Wood Green School before joining the Royal Navy in 1938, and fought in the Second World War until he left the Navy in September 1945. [3]

Philip Carter writes in the *Oxford Dictionary of National Biography* that Green's time with the Navy affected him deeply. He was reportedly shocked by the sailors' obsession with sex, and by 1958 had come to believe that their libido had been dangerously heightened by the intake of too much protein. [3] "I was astonished when things were said quite openly â ^ what a husband would say to his wife when home on leave," he told The *Sunday Times* "A Life in the Day" column in 1985. "I've always been a moral sort of person." He began to protect himself against erotic excess with a daily diet of porridge, home-made bread,

steamed vegetables and pulses, and a pound of apples. "Passion can be a great torment," he told the newspaper.[4]

After the war he took a job with the Fine Art Society, and it was while working there in March 1946 that he failed the entrance exam for the University of London. He later worked for Selfridges and the civil service, and as a storeman for Ealing Borough Council.[3] He said that he had lost jobs because on two occasions he had refused to be dishonest.[5] In 1962 he worked for the post office, then became a self-employed gardener, and seems to have earned his living that way until he started his full-time anti-protein campaign in 1968. He lived with his parents until they died â ^ his father in 1966 and his mother in 1967 â ^ after which he was given a council flat in Haydock Green, Northolt, Middlesex.[3]

[edit] His mission

[edit] On the streets

He began his mission in June 1968, at the age of 53, initially in Harrow on Saturdays, becoming a full-time human billboard six months later on Oxford Street. He cycled there from Northolt with a sandwich board attached to the bicycle, a journey of 12 miles (19Â km) that could take up to two hours, until he was given a free bus pass when he turned 65.[4]

He rose early, and after porridge for breakfast made bread that would rise while he was out on patrol, ready for his evening meal. He then prepared his lunch on a Bunsen burner, eating at 2:30 in a "warm and secret place" near Oxford Street.[4] He walked up and down the street six days a week, reduced to four days from 1985 onwards, campaigning until 6:30 pm among the shoppers. Saturday evenings he would spend with the cinema crowds in Leicester Square.[3] He would go to bed at 12:30 am, after saying a prayer. "Quite a good prayer, unselfish too," he told The Sunday Times. "It is a sort of acknowledgment of God, just in case there happens to be one." [4]

Peter Ackroyd wrote in London: The Biography that Green was for the most part ignored, becoming "a poignant symbol of the city's incuriosity and forgetfulness." [6] His advice to young women that they should eat a low-protein diet â ^ because "you cannot deceive your groom that you are a virgin on your wedding night!" [7] â ^ was not always appreciated, and led to his being arrested twice for public obstruction, once in 1980 and again in 1985.[3] "The injustice of it upsets me," he told The Sunday Times, "because I'm doing such a good job." He took to wearing overalls to protect himself from spit, several times finding it on his hat after a day's work.[4]

[edit] In writing

Sundays were spent at home, not always quietly, with the printing press on which Eight Passion Proteins was produced. It was described by Waldemar Januszczak as worthy of the cartoonist Heath Robinson â ^ who became known for his drawings of ancient contraptions [8] â ^ and the racket it made on print days caused trouble between Green and his neighbours.[7]

Eight Passion Proteins went through 52 editions between 1973 and 1993, and was noted for its eccentric typography, including the apparently random capitalization of words.[9] Raising the price only slightly over the years, from 10 pence in 1980 to 12 pence 13 years later, Green sold 20 copies on weekdays and up to 50 on Saturdays, a total of 87,000 copies by February 1993.[3]

The booklet identified the eight "passion-proteins" as meat, fish, birds, cheese, eggs, peas, beans, and nuts, arguing that "those who do not have to work hard with their limbs, and those who are inclined to sit about," will "store up their protein for passion," making retirement, for example, a period of increased passion and, therefore, marital discord. "We should not let passion defeat us," his pamphlet advised, "either alone or with a sexual friend, for discipline in the single years prepares us for the discipline of marriage." He singled out the BBC for particular criticism, accusing it of spreading "indiscretion, indiscipline, and indecency." [10]

Green was unable to find a publisher for his only novel, Behind the Veil: More than Just a Tale, which Carter describes as a "colourful account of the danger

of passion and the possibility of redemption." Two other manuscripts remain unpublished, a 67-page text called *Passion and Protein*, and a 392-page version of *Eight Passion Proteins*, rejected by Oxford University Press in 1971. Carter writes that Green's efforts on Oxford Street were augmented by a letter-writing campaign to the great and the good, and over the years *Eight Passion Proteins* made its way to five British prime ministers, the Prince of Wales, the Archbishop of Canterbury, the director-general of the BBC, the editor of *The Times*, the British Medical Association, and Pope Paul VI.[3]

[edit] Posthumous recognition

Green became well-known as one of London's eccentrics, and enjoyed his local fame. The *Sunday Times* interviewed him in 1985 for its "A Life in the Day" feature, and his "less passion, less protein" slogan was used by the London fashion house Red or Dead.[11]

When he died in 1993 at the age of 78, *The Daily Telegraph*, *The Guardian* and *The Times* all published obituaries. His letters, diaries, pamphlets and placards were given to the Museum of London, and other artefacts went to the Gunnersbury Park Museum.[12] His printing press was featured in Cornelia Parker's 1995 exhibition, "The Maybe," at the Serpentine Gallery, alongside Robert Maxwell's shoelaces, one of Winston Churchill's cigars, and Tilda Swinton in a glass box.[8] In 2006 he was given an entry in the *Oxford Dictionary of National Biography*. [1]

Over a decade after his death he was still remembered by writers and bloggers, fondly for the most part, though not invariably so: artist Alun Rowlands' documentary fiction, *3 Communiqués* (2007), portrayed him as trawling the streets of London, "campaigning for the suppression of desire." [13]

[edit] See also

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- ^ Blanchard, Tamsin. "Culture clash of the catwalk Titans", *The Independent*, 23 October 1995.
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- ^ Rowlands, Alun. *3 Communiqués*, Book Works, 2007.

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Persondata

Name

Green, Stanley

Alternative names

Short description

Human billboard

Date of birth

22 February 1915

Place of birth

Harringay, London, England

Date of death

4 December 1993

Place of death

Triaenops menamena is a bat in the genus *Triaenops* found on Madagascar, mainly in the drier regions. It was known as *Triaenops rufus* until 2009, when it was discovered that that name had been incorrectly applied to the species.

Triaenops rufus is in fact a synonym of *Triaenops persicus*, a Middle Eastern species closely related to *T. menamena*—indeed, the Malagasy species had previously been placed as a subspecies of *T. persicus* by some authors.

Triaenops menamena is mostly found in forests, but also occurs in other habitats. It often roosts in large colonies and eats insects such as butterflies and moths. Because of its wide range, common occurrence, and tolerance of habitat degradation, it is not considered to be threatened.

With a forearm length of 50 to 56 mm (2.0 to 2.2 in) in males and 46 to 53 mm (1.8 to 2.1 in) in females, this is a medium-sized bat. Its fur color is variable, ranging from reddish-brown to gray, but it is generally darker than the species in the closely related genus *Paratriaenops* which also occur on Madagascar. The skull contains a pronounced swelling around the nose and the second upper premolar is displaced outside the toothrow. The maximum frequency of the echolocation call averages 94.2 kHz and the species can easily be recognized on the basis of its call.

[edit] Taxonomy

In 1881, Alphonse Milne-Edwards described two new species in the genus *Triaenops* on the basis of specimens supposedly collected by Léon Humblot on Madagascar: the reddish *Triaenops rufus* and the larger, gray *T. humbloti*. [2] Jean Dorst, who reviewed Madagascan *Triaenops* in 1947, retained both as separate species; however, in another review, published in 1982, John Edwards Hill considered the two to represent the same species. In 1994, Karl Koopman considered *rufus* itself to be part of the Middle Eastern and mainland African species *Triaenops persicus*, a possibility Hill had discussed, [3] but most authors regarded the two as distinct species. [4] In 2006, Julie Ranivo and Steven Goodman revised Madagascan *Triaenops* and found little variation among specimens of *T. rufus* from throughout the dry parts of the island. [5] Three years later, they published another paper which showed that the original material of *T. rufus* and *T. humbloti* was distinct from Madagascan specimens identified as "*Triaenops rufus*" and more similar to *T. persicus*. [6] On his journey to Madagascar, Humblot had stayed in Somalia and Yemen, and Goodman and Ranivo concluded that he had probably collected the *Triaenops* there, after which their provenance was incorrectly recorded. [7] Thus, *rufus* and *humbloti* cannot be used for the Madagascan species, and Goodman and Ranivo proposed the new name *Triaenops menamena* for the species formerly known as *T. rufus*. The

specific name *menamena* is Malagasy for "reddish", referring to the animal's coloration.[8] "Rufous Trident Bat" has been used as a common name for *Triaenops rufus*. [1]

Triaenops menamena is currently one of four living species in the genus *Triaenops*; a 2009 revision by Petr Benda and Peter Vallo split off the African *T. afer* and the Yemeni *T. parvus* from *T. persicus* and removed three other species, including two from Madagascar, to the separate genus *Paratriaenops*. [9] An extinct species, *Triaenops goodmani*, is known from northwestern Madagascar. [10] In 2007 and 2008, Amy Russell and colleagues used phylogenetic and coalescent methodologies to investigate the history of the *Triaenops* group. They found that *T. menamena* (as *T. rufus*) was closest to mainland African *Triaenops* (but did not study Middle Eastern bats) and concluded that *T. menamena* and the species of *Paratriaenops* (then still placed in *Triaenops*) independently reached Madagascar from Africa; the colonization of the island by *T. menamena* was dated to about 660,000 years ago. [11] Benda and Vallo also studied phylogenetic relationships in *Triaenops* and included Middle Eastern *T. persicus* and *T. parvus* in their analysis. They found little resolution of relationships within *Triaenops*, but some evidence suggested that *T. menamena* is more closely related to the Middle Eastern species than to *T. afer* in mainland Africa; therefore, *T. menamena* may have reached Madagascar from the Middle East or northeastern Africa. They also placed the split between *T. menamena* and the other species much further back, at around 4 million years ago. [12]

[edit] Description
Measurements [13]

Sex

n[Note 1]

Total length

Tail

Hindfoot

Ear

Forearm

Mass

Male

28[Note 2]

90â ^104

27â ^38

6â ^9

14â ^17

50â ^56

8.2â ^15.5

Female

67

86â ^98

28â ^39

6â ^9

12â ^17

46â ^53

6.6â ^11.5

Measurements are in millimeters (except weight in grams) and in the form "minimumâ ^maximum".

Triaenops menamena is a medium-sized species with variable fur coloration, ranging from reddish-brown to gray. It is larger and darker than *Paratriaenops auritus* and *P. furculus*. [14] Among living *Triaenops* species, it is smaller than *T. persicus* and *T. afer*, but somewhat larger than *T. parvus*. [15] The extinct *Triaenops goodmani*, which is known only from three mandibles (lower jaws), is also larger. [16] In the complexly shaped noseleaf (a group of fleshy structures around the nose and mouth), [17] *T. menamena* has the trident structure characteristic of *Triaenops* and *Paratriaenops*: three adjacent lancets (projecting structures) on the posterior leaf. In *T. menamena*, the two outer lancets are shorter than the middle one and curved, whereas the three lancets

are more equal in *Paratriaenops*.^[18] The anterior leaf contains a broad, flat, horizontal process and the intermediate leaf contains a pointed process.^[19] The ears are small and broad^[17] and contain notches on the inner side.^[14] The fur is silky and the hairs on the body are about 5 to 6 mm long. The wing membrane is dark and translucent and the end of the tail usually projects from the uropatagium (tail membrane).^[19] Males average slightly larger than females.^[20] Wingspan is 270 to 305 mm (10.6 to 12.0 in).^[21]

The skull is similar to that of Madagascan *Paratriaenops*, but the premaxilla is longer. The rostrum (front part of the skull) is well-developed and contains a pronounced nasal swelling, which is less pronounced than in *Paratriaenops*; the depression behind the swelling is relatively shallow.^[22] Compared to other species of *Triaenops*, the rostrum is relatively narrow and short, similar to *T. parvus*; *T. afer* and *T. persicus* have a broader rostrum.^[15] The front margin of the rostrum is cast back between the left and right corners. A transverse line passes over the roof of the rostrum.^[22] The infraorbital foramen, an opening in the skull, is oblong in shape. The zygomatic arches (cheekbones) are not broadened towards the sides, are connected to the maxillaries by broad bones, and contain clear crests on their upper sides. In *T. menamena*, these crests are rectangular in form and larger than in *Paratriaenops*.^[23] The braincase is lower than in other species of *Triaenops*.^[24] The sagittal crest, which is on the roof of the braincase, is poorly developed.^[23] In the mandible, the coronoid process is blunt and rounded, but the angular process (both processes at the back of the bone) is small.^[25]

The upper incisors have two cusps and the upper canine has three—a large central one, a small but well-developed one at the back, and a small cuspule at the front.^[25] The front upper premolar is projected outside the toothrow, so that the canine before it and back premolar behind it touch.^[14] The first lower incisor has two cusps and the second has three.^[25] On the second lower molar, the protoconid cusp is notably taller than the hypoconid; these cusps are about as high in *T. goodmani*.^[16]

The species can easily be identified from recordings of its echolocation call.^[26] The call consists of a component with constant frequency followed by a short one with changing frequency. The call takes 6.5 to 13.5 ms, averaging 10.1 ms, and the period between two calls is 22.7 to 86.3 ms, averaging 42.7 ms. The maximum frequency averages 94.2 kHz, the minimum frequency averages 82.0 kHz, and the call emits the most energy at a frequency of 93.2 kHz.^[27]

[edit] Distribution and ecology

Triaenops menamena mainly occurs in the dry regions of western Madagascar, but has also been recorded in humid areas in the far southeast and northeast,^[8] and is found up to 1300 m (4300 ft) above sea level.^[1] It mainly occurs in forests,^[28] but has also been recorded outside forest and is not dependent on it.^[1] An obligate cave dweller,^[29] it is known to roost in large colonies, with one cave colony estimated to contain over 40,000 bats; this cave also contained an estimated 10,000 *Paratriaenops furculus*.^[30] The effective population size of the species is estimated to be about 121,000.^[31] Lepidoptera (butterflies and moths) form the main component of its diet, but it also eats Coleoptera (beetles) and Hemiptera (bugs) and fewer members of some other insect orders.^[32] It is unclear how the ecological niches of *Triaenops* and the less frequently captured *Paratriaenops furculus* are separated, as both eat lepidopterans and occur in the same regions.^[33]

[edit] Conservation status

Under *Triaenops rufus*, the IUCN Red List lists this species as "Least Concern", citing its common occurrence over a wide distribution and tolerance of human modifications of its habitat, even though its forest habitat is being destroyed in places. It has been recorded in numerous protected areas.^[1] Bats, mainly the large *Hipposideros commersoni*, are sometimes hunted for food in southwestern Madagascar, and *T. menamena* is also taken incidentally.^[34]

[^] Number of specimens measured.

[^] 27 for total length.

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Fight Club is a 1999 American film based on the 1996 novel of the same name by Chuck Palahniuk. The film was directed by David Fincher and stars Edward Norton, Brad Pitt, and Helena Bonham Carter. Norton plays the unnamed protagonist, an "everyman" who is discontented with his white-collar job. He forms a "fight club" with soap maker Tyler Durden, played by Pitt, and becomes embroiled in a relationship with him and a dissolute woman, Marla Singer, played by Bonham Carter.

Palahniuk's novel was optioned by 20th Century Fox producer Laura Ziskin, who hired Jim Uhls to write the film adaptation. Fincher was one of four directors the producers considered and hired him because of his enthusiasm for the film. Fincher developed the script with Uhls and sought screenwriting advice from the cast and others in the film industry. The director and the cast compared the film to *Rebel Without a Cause* (1955) and *The Graduate* (1967). Fincher intended Fight Club's violence to serve as a metaphor for the conflict between a generation of young people and the value system of advertising. The director copied the homoerotic overtones from Palahniuk's novel to make audiences uncomfortable and keep them from anticipating the twist ending.[1]

Studio executives did not like the film and they restructured Fincher's intended marketing campaign to try to reduce anticipated losses. Fight Club failed to meet the studio's expectations at the box office and received

polarized reactions from critics. It was cited as one of the most controversial and talked-about films of 1999. However, the film later found commercial success with its DVD release, which established *Fight Club* as a cult film. Critical reception of *Fight Club* has since become more positive.

In 2008, *Fight Club* was named the 10th greatest movie of all time by *Empire* magazine in its issue of *The 500 Greatest Movies of All Time*.^[2]

The unnamed narrator (Norton) is a traveling automobile company employee who suffers from insomnia. His doctor refuses to give him medication and advises him to visit a support group to witness more severe suffering. The narrator attends a support group for testicular cancer victims and, after fooling them into thinking that he is a fellow victim, finds an emotional release that relieves his insomnia. He becomes addicted to attending support groups and pretending to be a victim, but the presence of another impostor, Marla Singer (Bonham Carter), disturbs him, so he negotiates with her to avoid their meeting at the same groups.

After a flight home from a business trip, the narrator finds his apartment destroyed by an explosion. He calls Tyler Durden (Pitt), a soap salesman whom he befriended on the flight, and they meet at a bar. A conversation about consumerism leads to Tyler inviting the narrator to stay at his place; outside the bar he requests that the narrator hit him. The two engage in a fistfight, and the narrator subsequently moves into Tyler's dilapidated house. They have further fights outside the bar, and these attract a crowd of men. The fighting moves to the bar's basement where the men form a "fight club".

Marla overdoses on pills and telephones the narrator for help; he ignores her, but Tyler answers the call and saves her. Tyler and Marla become sexually involved, and Tyler warns the narrator never to talk to Marla about him. More fight clubs form across the country, and under Tyler's leadership, they become the anti-materialist and anti-corporate organization called "Project Mayhem". The narrator complains to Tyler that he wants to be more involved in the organization, but Tyler suddenly disappears. When a member of Project Mayhem is killed by the police during a botched sabotage operation, the narrator tries to shut down the project, and follows evidence of Tyler's national travels to track him down. In one city, a Project member greets the narrator as Tyler Durden. The narrator calls Marla from his hotel room and discovers that Marla also believes him to be Tyler. He suddenly sees Tyler in his room, and Tyler explains that they are dissociated personalities in the same body. When the narrator has believed himself to be asleep, Tyler has in fact been controlling his body.

The narrator blacks out after the conversation. When he wakes, he discovers from his telephone log that Tyler made calls during his blackout. He uncovers Tyler's plans to erase debt by destroying buildings that contain credit card companies' records. The narrator tries to contact the police but finds that the officers are members of the Project. He attempts to disarm explosives in a building, but Tyler subdues him and moves to a safe building to watch the destruction. The narrator, held by Tyler at gunpoint, realizes that in sharing the same body with Tyler, he himself is actually holding the gun. He fires it into his mouth, shooting through the cheek without killing himself. Tyler collapses with an exit wound to the back of his head, and the narrator stops mentally projecting him. Afterward, Project Mayhem members bring a kidnapped Marla to him, believing him to be Tyler, and leave them alone. The explosives detonate, collapsing the buildings, and the narrator and Marla watch the scene, holding hands.

[edit] Themes

"We're designed to be hunters and we're in a society of shopping. There's nothing to kill anymore, there's nothing to fight, nothing to overcome, nothing to explore. In that societal emasculation this everyman [the narrator] is created."

Fincher said *Fight Club* was a coming of age film, like the 1967 film *The Graduate* but for people in their 30s. Fincher described the narrator as an "everyman";[3] the character is identified in the script as "Jack", but left unnamed in the film.[4] Fincher outlined the narrator's background: "He's tried to do everything he was taught to do, tried to fit into the world by becoming the thing he isn't." The narrator cannot find happiness, so he travels on a path to enlightenment in which he must "kill" his parents, his god, and his teacher. At the start of the film, he has killed his parents. With Tyler Durden, he kills his god by doing things they are not supposed to do. To complete the process of maturing, the narrator has to kill his teacher, Tyler Durden.[5]

The character is a 1990s inverse of *The Graduate* archetype: "a guy who does not have a world of possibilities in front of him, he has no possibilities, he literally cannot imagine a way to change his life". He is confused and enraged, so he responds to his environment by creating Tyler Durden, a Nietzschean *Übermensch*, in his mind. While Tyler is who the narrator would want to be, he is not empathetic and does not help the narrator face decisions in his life "that are complicated and have moral and ethical implications". Fincher explained, "[Tyler] can deal with the concepts of our lives in an idealistic fashion, but it doesn't have anything to do with the compromises of real life as modern man knows it. Which is: You're not really necessary to a lot of what's going on. It's built, it just needs to run now." [3] While studio executives worried that *Fight Club* was going to be "sinister and seditious", Fincher sought to make it "funny and seditious" by including humor to temper the sinister element.[6]

Uhls described the film as a "romantic comedy", explaining, "It has to do with the characters' attitudes toward a healthy relationship, which is a lot of behavior which seems unhealthy and harsh to each other, but in fact does work for themâ because both characters are out on the edge psychologically." [7] The narrator seeks intimacy, but he avoids it with Marla Singer, seeing too much of himself in her.[8] While Marla is a seductive and negativist prospect for the narrator, he instead embraces the novelty and excitement that comes with befriending Tyler Durden. The narrator is comfortable being personally connected to Tyler Durden, but he becomes jealous when Tyler becomes sexually involved with Marla. When the narrator argues with Tyler about their friendship, Tyler tells him that being friends is secondary to pursuing the philosophy they have been exploring.[9] Tyler also suggests doing something about Marla, implying that she is a risk to be removed. When Tyler says this, the narrator realizes that his desires should have been focused on Marla and begins to diverge from Tyler's path.[8]

"We decided early on that I would start to starve myself as the film went on, while [Brad Pitt] would lift and go to tanning beds; he would become more and more idealized as I wasted away."

The unreliable narrator is not immediately aware that Tyler Durden originated in him and is being mentally projected. He also mistakenly promotes the fight clubs as a way to feel powerful,[12] though the narrator's physical condition worsens while Tyler Durden's appearance improves. While Tyler desires "real experiences" of actual fights like the narrator at first,[13] he manifests a nihilistic attitude of rejecting and destroying institutions and value systems.[14] His impulsive nature, representing the id,[8] conveys an attitude that is seductive and liberating to the narrator and the members of Project

Mayhem. Tyler's initiatives and methods become dehumanizing;[14] he orders around the members of Project Mayhem with a megaphone similar to camp directors at Chinese re-education camps.[8] The narrator pulls back from Tyler and in the end, he arrives at a middle ground between his two conflicting selves.[9]

Edward Norton said, "I feel that *Fight Club* really, in a way... probed into the despair and paralysis that people feel in the face of having inherited this value system out of advertising." [13] Brad Pitt said, "*Fight Club* is a metaphor for the need to push through the walls we put around ourselves and just go for it, so for the first time we can experience the pain." [15] *Fight Club* also parallels the 1955 film *Rebel Without a Cause*; both probe the frustrations of the people that live in the system.[13] The characters, having undergone societal emasculation, are reduced to "a generation of spectators".[16] A culture of advertising defines society's "external signifiers of happiness", causing an unnecessary chase for material goods that replaces the more essential pursuit of spiritual happiness. The film references Calvin Klein, IKEA, and the Volkswagen New Beetle. Norton said of the Beetle, "We smash it... because it seemed like the classic example of a Baby Boomer generation marketing plan that sold culture back to us." [17] His character also walks through his apartment while visual effects identify his many IKEA possessions. Fincher described the narrator's immersion, "It was just the idea of living in this fraudulent idea of happiness." Pitt explained the dissonance, "I think there's a self-defense mechanism that keeps my generation from having any real honest connection or commitment with our true feelings. We're rooting for ball teams, but we're not getting in there to play. We're so concerned with failure and success... like these two things are all that's going to sum you up at the end." [15]

The violence of the fight clubs serves not to promote or glorify physical combat, but for participants to experience feeling in a society where they are otherwise numb.[19] The fights tangibly represent a resistance to the impulse to be "cocooned" in society.[16] Norton believed that the fighting between the men strips away the "fear of pain" and "the reliance on material signifiers of their self-worth", leaving them to experience something valuable.[13] When the fights evolve into revolutionary violence, the film only half-accepts the revolutionary dialectic by Tyler Durden; the narrator pulls back and rejects Durden's ideas.[9] *Fight Club* purposely shapes an ambiguous message, the interpretation of which is left to the audience.[14] Fincher elaborated, "I love this idea that you can have fascism without offering any direction or solution. Isn't the point of fascism to say, 'This is the way we should be going'? But this movie couldn't be further from offering any kind of solution." [6]

[edit] Production

[edit] Development

The novel *Fight Club* by Chuck Palahniuk was published in 1996. Before its publication, a 20th Century Fox book scout sent a galley proof of the novel to creative executive Kevin McCormick. The executive tasked a studio reader to review the proof as a candidate for a film adaptation, but the reader discouraged it. McCormick then forwarded the proof to producers Lawrence Bender and Art Linson, who also rejected it. Producers Josh Donen and Ross Bell saw potential and expressed interest. They arranged unpaid screen readings with actors to determine the script's length, and an initial reading lasted six hours. The producers cut out sections to reduce the running time, and they used the shorter script to record its dialogue. Bell sent the recording to Laura Ziskin, head of the division Fox 2000, who listened to the tape and purchased the rights to *Fight Club* from Palahniuk for \$10,000.[20]

Ziskin initially considered hiring Buck Henry to write the adaptation, finding *Fight Club* similar to the 1967 film *The Graduate*, which Henry had adapted. When a new screenwriter, Jim Uhls, lobbied Donen and Bell for the job, the producers chose him over Henry. Bell contacted four directors to direct the film. He considered Peter Jackson the best choice, but Jackson was too busy filming the 1996 film *The Frighteners* in New Zealand. Bryan Singer received the book but

did not read it. Danny Boyle met with Bell and read the book, but he pursued another film. David Fincher, who had read *Fight Club* and tried to buy the rights himself, talked with Ziskin about directing the film. He hesitated to accept the assignment with 20th Century Fox at first because he had an unpleasant experience directing the 1992 film *Alien 3* for the studio. To repair his relationship with the studio, he met with Ziskin and studio head Bill Mechanic.[20] In August 1997, 20th Century Fox announced that Fincher would direct the film adaptation of *Fight Club*. [21]

[edit] Casting

Actor

Role

Norton, EdwardEdward Norton

...

Narrator, TheThe Narrator

Pitt, BradBrad Pitt

...

Durden, TylerTyler Durden

Carter, Helena BonhamHelena Bonham Carter

...

Singer, MarlaMarla Singer

Leto, JaredJared Leto

...

Angel Face, Angel Face

Meat Loaf, Meat Loaf

...

Paulson, RobertRobert Paulson

Grenier, ZachZach Grenier

...

Chesler, RichardRichard Chesler

Producer Ross Bell met with actor Russell Crowe to discuss his candidacy for the role of Tyler Durden. Producer Art Linson, who joined the project late, met with another candidate, Brad Pitt. Linson was the senior producer of the two, so the studio sought to cast Pitt instead of Crowe.[20] Pitt was looking for a new film after the failure of his 1998 film *Meet Joe Black*, and the studio believed *Fight Club* would be more commercially successful with a major star. The studio signed Pitt and offered him a \$17.5 million salary.[22]

For the role of the unnamed narrator, the studio desired a "sexier marquee name" like Matt Damon to increase the film's commercial prospects; it also considered Sean Penn. Fincher instead considered Edward Norton a candidate for the role, based on the actor's performance in the 1996 film *The People vs. Larry Flynt*. [23] Other studios were approaching Norton for leading roles in developing films like *The Talented Mr. Ripley* and *Man on the Moon*. The actor was cast in *Runaway Jury*, but the film did not reach production. 20th Century Fox offered Norton a \$2.5 million salary to attract him to *Fight Club*. Norton could not accept the offer immediately since he still owed Paramount Pictures a film. He signed a contractual obligation with Paramount to appear in one of the studio's future films for a smaller salary (Norton satisfied the obligation with his role in the 2003 film *The Italian Job*). [22]

In January 1998, 20th Century Fox announced that Brad Pitt and Edward Norton were cast in the film.[24] The actors prepared for their roles by taking lessons in boxing, taekwondo, grappling,[25] and soapmaking.[26] Pitt voluntarily visited a dentist to have pieces of his front teeth chipped off so his character would not have perfect teeth. The pieces were restored after filming concluded.[27]

Fincher's first choice for the role of Marla Singer was Janeane Garofalo, who objected to the film's sexual content.[28] The filmmakers considered Courtney Love and Winona Ryder as candidates early on.[29] The studio wanted to cast Reese Witherspoon, but Fincher objected that she was too young for the role.[22] He chose to cast Helena Bonham Carter based on her performance in the 1997 film *The Wings of the Dove*. [30]

[edit] Writing

Screenwriter Jim Uhls started working on an early draft of the adapted screenplay, which excluded a voice-over because the industry perceived at the time that the technique was "hackneyed and trite". When Fincher joined the film, he thought that the film should have a voice-over, believing that the film's humor came from the narrator's voice.[22] The director described the film without a voice-over as seemingly "sad and pathetic".[31] Fincher and Uhls revised the script for six to seven months and by 1997 had a third draft that reordered the story and left out several major elements. When Pitt was cast, he was concerned that his character, Tyler Durden, was too one-dimensional. Fincher sought the advice of writer-director Cameron Crowe, who suggested giving the character more ambiguity. Fincher also hired screenwriter Andrew Kevin Walker for assistance. The director invited Pitt and Norton to help revise the script, and the group drafted five revisions in the course of a year.[22]

Chuck Palahniuk praised the faithful film adaptation of his novel and applauded how the film's plot was more streamlined than the book's. Palahniuk recalled how the writers debated if film audiences would believe the plot twist from the novel. Fincher supported including the twist, arguing, "If they accept everything up to this point, they'll accept the plot twist. If they're still in the theater, they'll stay with it." [32] Palahniuk's novel also contained homoerotic overtones, which the director included in the film to make audiences uncomfortable and accentuate the surprise of the film's twists.[1] The bathroom scene where Tyler Durden bathes next to the narrator is an example of the overtones; the line, "I'm wondering if another woman is really the answer we need," was meant to suggest personal responsibility rather than homosexuality.[8] Another example is the scene at the beginning of the film in which Tyler Durden puts a gun barrel down the narrator's mouth.[33]

The narrator finds redemption at the end of the film by rejecting Tyler Durden's dialectic, a path that diverged from the novel's ending in which the narrator is placed in a mental institution.[6] Norton drew parallels between redemption in the film and redemption in *The Graduate*, indicating that the protagonists of both films find a middle ground between two divisions of self.[9] Fincher considered the novel too infatuated with Tyler Durden and changed the ending to move away from him: "I wanted people to love Tyler, but I also wanted them to be OK with his vanquishing." [6]

[edit] Filming

Studio executives Mechanic and Ziskin planned an initial budget of \$23 million to finance the film,[20] but by the start of production, the budget was increased to \$50 million. Half was paid by New Regency, but during filming, the projected budget escalated to \$67 million. New Regency's head and *Fight Club* executive producer Arnon Milchan petitioned Fincher to reduce costs by at least \$5 million. The director refused, so Milchan threatened Mechanic that New Regency would withdraw financing. Mechanic sought to restore Milchan's support by sending him tapes of dailies from *Fight Club*. After seeing three weeks of filming, Milchan reinstated New Regency's financial backing.[34] The final production budget was \$63 million.[35]

The fight scenes were heavily choreographed, but the actors were required to "go full out" to capture realistic effects like having the wind knocked out of them.[15] Makeup artist Julie Pearce, who worked for the director on the 1997 film *The Game*, studied mixed martial arts and pay-per-view boxing to portray the fighters accurately. She designed an extra's ear to have cartilage missing, citing as inspiration the boxing match in which Mike Tyson bit off part of Evander Holyfield's ear.[36] Makeup artists devised two methods to create sweat on cue: spraying mineral water over a coat of Vaseline, and using the unadulterated water for "wet sweat". Meat Loaf, who plays a member of the fight club who has "bitch tits", wore a 90-pound (40 kg) fat harness that gave him large breasts for the role.[25] He also wore eight-inch (20 cm) lifts in his scenes with Norton to be taller than him.[8]

Filming lasted 138 days,[37] during which Fincher shot more than 1,500 rolls

of film, three times the average for a Hollywood film.[25] The locations were in and around Los Angeles and on sets built at the studio in Century City.[37] Production designer Alex McDowell constructed more than 70 sets.[25] The exterior of Tyler Durden's house was built in San Pedro, California, while the interior was built on a sound stage at the studio's location. The interior was given a decayed look to illustrate the deconstructed world of the characters.[37] Marla Singer's apartment was based on photographs of the Rosalind Apartments in downtown LA. Overall production included 300 scenes, 200 locations, and complex special effects. Fincher compared *Fight Club* to his succeeding and less complex film *Panic Room*, "I felt like I was spending all my time watching trucks being loaded and unloaded so I could shoot three lines of dialogue. There was far too much transportation going on." [38]

[edit] Cinematography

Fincher used the Super 35 format to film *Fight Club* since it gave him maximum flexibility in composing shots. He hired Jeff Cronenweth as cinematographer; Cronenweth's father Jordan Cronenweth was the cinematographer who worked for Fincher on the 1992 film *Alien 3* but left midway through its production due to Parkinson's disease. Fincher explored visual styles in his previous films *Seven* and *The Game*, and he and Cronenweth drew elements from these styles for *Fight Club*. [37]

They applied a lurid style, choosing to make people "sort of shiny". The appearance of the narrator's scenes without Tyler Durden were bland and realistic. The scenes with Tyler were described by Fincher as "more hyper-real in a torn-down, deconstructed senseâ ~a visual metaphor of what [the narrator is] heading into". The filmmakers used heavily desaturated colors in the costuming, makeup, and art direction.[37] Helena Bonham Carter wore opalescent makeup to portray her romantic nihilistic character with a "smack-fiend patina". Fincher and Cronenweth drew influences from the 1973 film *American Graffiti*, which applied a mundane look to nighttime exteriors while simultaneously including a variety of colors.

The crew took advantage of both natural and practical light at filming locations. The director sought various approaches to the lighting setups, for example choosing several urban locations for the city lights' effects on the shots' backgrounds. He and the crew also embraced fluorescent lighting at other practical locations to maintain an element of reality and to light the prostheses depicting the characters' injuries.[37] On the other hand, Fincher also ensured that scenes were not so strongly lit so the characters' eyes were less visible, citing cinematographer Gordon Willis's technique as the influence.[8]

Fight Club was filmed mostly at night and Fincher purposely filmed the daytime shots in shadowed locations. The crew equipped the bar's basement with inexpensive work lamps to create a background glow. Fincher avoided stylish camerawork when filming early fight scenes in the basement and instead placed the camera in a fixed position. In later fight scenes, Fincher moved the camera from the viewpoint of a distant observer to that of the fighter.[37]

The scenes with Tyler Durden were staged to conceal that the character was a mental projection of the unnamed narrator. The character was not filmed in two shots with a group of people, nor was he shown in any over the shoulder shots in scenes where Tyler gives the narrator specific ideas to manipulate him. In scenes before the narrator meets Tyler, the filmmakers inserted Tyler's presence in single frames for subliminal effect. Tyler appears in the background and out of focus, like a "little devil on the shoulder".[8] Fincher explained the subliminal frames: "Our hero is creating Tyler Durden in his own mind, so at this point he exists only on the periphery of the narrator's consciousness." [39]

While Cronenweth generally rated and exposed the Kodak film stock normally on *Fight Club*, several other techniques were applied to change its appearance. Flashing was implemented on much of the exterior night photography, the contrast was stretched to be purposely ugly, the print was adjusted to be underexposed, Technicolor's ENR silver retention was used on a select number of

prints to increase the density of the film's blacks, and high-contrast print stocks were chosen to create a "stepped-on" look on the print with a dirty patina.

[edit] Visual effects

Fincher hired visual effects supervisor Kevin Tod Haug, who worked for him on *The Game*, to create visual effects for *Fight Club*. Haug assigned the visual effects artists and experts to different facilities that each addressed different types of visual effects: CG modeling, animation, compositing, and scanning. Haug explained, "We selected the best people for each aspect of the effects work, then coordinated their efforts. In this way, we never had to play to a facility's weakness." Fincher visualized the narrator's perspective through a "mind's eye" view and structured a myopic framework for the film audiences. Fincher also used previsualized footage of challenging main-unit and visual effects shots as a problem-solving tool to avoid making mistakes during the actual filming.[39]

The film's title sequence is a 90-second visual effects composition that depicts the inside of the narrator's brain at a microscopic level; the camera pulls back to the outside, starting at his fear center and following the thought processes initiated by his fear impulse. The sequence, designed in part by Fincher, was budgeted separately from the rest of the film at first, but the sequence was awarded by the studio in January 1999.[39] Fincher hired Digital Domain and its visual effects supervisor Kevin Mack, who won an Academy Award for Visual Effects for the 1998 film *What Dreams May Come*, for the sequence. The company mapped the computer-generated brain using an L-system,[41] and the design was detailed using renderings by medical illustrator Katherine Jones. The pullback sequence from within the brain to the outside of the skull included neurons, action potentials, and a hair follicle. Haug explained the artistic license that Fincher took with the shot, "While he wanted to keep the brain passage looking like electron microscope photography, that look had to be coupled with the feel of a night dive—wet, scary, and with a low depth of field." The shallow depth of field was accomplished with the ray tracing process.[39]

Other visual effects include an early scene in which the camera flashes past city streets to survey Project Mayhem's destructive equipment lying in underground parking lots; the sequence was a three-dimensional composition of nearly 100 photographs of Los Angeles and Century City by photographer Michael Douglas Middleton. The final scene of the demolition of the credit card office buildings was designed by Richard Baily of Image Savant; Baily worked on the scene for over fourteen months.[39]

Midway through the film, Tyler Durden points out the cue mark—nicknamed "cigarette burn" in the film—to the audience. The scene represents a turning point that foreshadows the coming rupture and inversion of the "fairly subjective reality" that existed earlier in the film. The director explained, "Suddenly it's as though the projectionist missed the changeover, the viewers have to start looking at the movie in a whole new way." [39]

[edit] Musical score

Fincher was concerned that bands experienced in writing film scores would be unable to tie the movie's themes together, so he sought a band which had never recorded for film. He pursued Radiohead,[8] but ultimately chose the breakbeat producing duo Dust Brothers to score the film. The duo created a post-modern score that included drum loops, electronic scratches, and computerized samples. Dust Brothers performer Michael Simpson explained the setup: "Fincher wanted to break new ground with everything about the movie, and a nontraditional score helped achieve that." [42] The end credits feature the song "Where Is My Mind?" by the Pixies.[43]

[edit] Release

[edit] Marketing

Filming concluded in December 1998, and David Fincher edited the footage in early 1999 to prepare *Fight Club* for a screening with senior executives. They did not receive the film positively and were concerned that there would not be

an audience for the film.[44] Executive producer Art Linson, who supported the film, recalled the response: "So many incidences of Fight Club were alarming, no group of executives could narrow them down." [45] Nevertheless, Fight Club was originally slated to be released in July 1999[46] but was later changed to August 6, 1999. The studio further delayed the film's release, this time to autumn, citing a crowded summer schedule and a hurried post-production process.[47] Outsiders attributed the delays to the Columbine High School massacre earlier in the year.[48]

Marketing executives at 20th Century Fox faced difficulties in marketing Fight Club and at one point considered marketing it as an art film. They considered that the film was primarily geared toward male audiences because of its violence and believed that not even Brad Pitt would attract female filmgoers. Research testing showed that the film appealed to teenagers. Fincher refused to let the posters and trailers focus on Pitt and encouraged the studio to hire the advertising firm Wieden+Kennedy to devise a marketing plan. The firm proposed a bar of pink soap with the title "Fight Club" embossed on it as the film's main marketing image; the proposal was considered "a bad joke" by Fox executives. Fincher also released two early trailers in the form of fake public service announcements presented by Pitt and Norton; the studio did not think the trailers marketed the film appropriately. Instead, the studio financed a \$20 million large-scale campaign to provide a press junket, posters, billboards, and trailers for TV that highlighted the film's fight scenes. The studio advertised Fight Club on cable during World Wrestling Federation broadcasts, which Fincher protested, believing that the placement created the wrong context for the film.[44] Linson believed that the "ill-conceived one-dimensional" marketing by marketing executive Robert Harper largely contributed to Fight Club's lukewarm box office performance in the United States.[49]

[edit] Theatrical run

The studio held Fight Club's world premiere at the 56th Venice International Film Festival in September 1999.[50] For the American theatrical release, the studio hired the National Research Group to test screen the film; the group predicted the film would gross between \$13 million and \$15 million in its opening weekend.[51] Fight Club opened commercially in the United States and Canada on October 15, 1999 and earned \$11,035,485 in 1,963 theaters over the opening weekend.[35] The film ranked first at the weekend box office, defeating Double Jeopardy and The Story of Us, a fellow weekend opener.[52] The gender mix of audiences for Fight Club, argued to be "the ultimate anti-date flick", was 61% male and 39% female; 58% of audiences were below the age of 21. Despite the film's top placement, its opening gross fell short of the studio's expectations.[53] Over the second weekend, Fight Club dropped 42.6% in revenue, earning \$6,335,870.[54] The film, whose production budget was \$63 million, grossed \$37 million from its theatrical run in the United States and Canada and earned \$100.9 million in theaters worldwide.[35] The underwhelming North American performance of Fight Club soured the relationship between 20th Century Fox's studio head Bill Mechanic and media executive Rupert Murdoch, which contributed to Mechanic's resignation in June 2000.[55]

The British Board of Film Classification reviewed Fight Club for its November 12, 1999 release in the United Kingdom and removed two scenes involving "an indulgence in the excitement of beating a (defenseless) man's face into a pulp". The board assigned the film an 18 certificate, limiting the release to adult-only audiences in the UK. The BBFC did not censor any further, considering and dismissing claims that Fight Club contained "dangerously instructive information" and could "encourage anti-social (behavior)". The board decided, "The film as a whole is a quite clearly critical and sharply parodic of the amateur fascism which in part it portrays. Its central theme of male machismo (and the anti-social behaviour that flows from it) is emphatically rejected by the central character in the concluding reels." [56] The scenes were restored in a two-disc DVD edition released in the UK in March 2007.[57]

[edit] Home media

Fincher supervised the composition of the DVD packaging and was one of the first directors to participate in a film's transition to home media. The film was released in two DVD editions.[58] The single-disc edition included a commentary track,[59] while the two-disc special edition included the commentary track, behind-the-scenes clips, deleted scenes, trailers, fake public service announcements, the promotional music video "This is Your Life", Internet spots, still galleries, cast biographies, storyboards, and publicity materials.[60] The director worked on the DVD as a way to finish his vision for the film. Julie Markell, 20th Century Fox's senior vice president of creative development, said the DVD packaging complemented the director's vision: "The film is meant to make you question. The package, by extension, tries to reflect an experience that you must experience for yourself. The more you look at it, the more you'll get out of it." The studio developed the packaging for two months.[61] The two-disc special edition DVD was packaged to look covered in brown cardboard wrapper. The title "Fight Club" was labeled diagonally across the front, and packaging appeared tied with twine. Markell said, "We wanted the package to be simple on the outside, so that there would be a dichotomy between the simplicity of brown paper wrapping and the intensity and chaos of what's inside." [61] Deborah Mitchell, 20th Century Fox's vice president of marketing, described the design: "From a retail standpoint, [the DVD case] has incredible shelf-presence." [62]

Fight Club won the 2000 Online Film Critics Society Awards for Best DVD, Best DVD Commentary, and Best DVD Special Features.[63] Entertainment Weekly ranked the film's two-disc edition in first place on its 2001 list of "The 50 Essential DVDs", giving top ratings to the DVD's content and technical picture-and-audio quality.[64] When the two-disc edition went out of print, the studio re-released it in 2004 because of fans' requests.[65] The DVD was one of the largest-selling in the studio's history; [49] it also grossed \$55 million in video and DVD rentals.[66] With a weak box office performance in the United States and Canada, a better performance in other territories, and the highly successful DVD release, Fight Club generated a \$10 million profit for the studio.[49]

Fight Club was released in the Blu-ray Disc format in the United States on November 17, 2009.[67] Fox Creative chose Neuron Syndicate to design the art for the format's packaging, and Neuron commissioned five graffiti artists to create 30 pieces of art. The art encompasses urban aesthetics found on the East Coast and West Coast of the United States as well as influences from European street art.[68] The Blu-ray edition opens with a menu screen for the romantic comedy *Never Been Kissed* starring Drew Barrymore before leading into the actual Fight Club menu screen. David Fincher got permission from Barrymore to include the fake menu screen.[69]

[edit] Critical reception

When Fight Club premiered at the 56th Venice International Film Festival, the film was debated fiercely by critics. A newspaper reported, "Many loved and hated it in equal measures." Some critics expressed concern that the film would incite copycat behavior, such as that seen after *A Clockwork Orange* debuted in Britain nearly three decades previously.[70] Upon the film's theatrical release, *The Times* reported the reaction: "It touched a nerve in the male psyche that was debated in newspapers across the world." [71] Although the film's makers called Fight Club "an accurate portrayal of men in the 1990s", some critics called it "irresponsible and appalling". Another newspaper charged, "Fight Club is shaping up to be the most contentious mainstream Hollywood meditation on violence since Stanley Kubrick's *A Clockwork Orange*." [72]

Janet Maslin, reviewing for *The New York Times*, praised Fincher's direction and editing of the film. She wrote that Fight Club carried a message of "contemporary manhood", and that, if not watched closely, the film could be misconstrued as an endorsement of violence and nihilism.[73] Roger Ebert, reviewing for the *Chicago Sun-Times*, called Fight Club "visceral and

hard-edged", and "a thrill ride masquerading as philosophy" that most audiences would not appreciate.[74] Ebert later acknowledged that the film was "beloved by most, not by me".[75] Jay Carr of The Boston Globe opined that the film began with an "invigoratingly nervy and imaginative buzz", but that it eventually became "explosively silly".[76] Newsweek's David Ansen described Fight Club as "an outrageous mixture of brilliant technique, puerile philosophizing, trenchant satire and sensory overload" and thought that the ending was too pretentious.[77] Richard Schickel of Time described the director's *mise en scène* as dark and damp: "It enforces the contrast between the sterilities of his characters' aboveground life and their underground one. Water, even when it's polluted, is the source of life; blood, even when it's carelessly spilled, is the symbol of life being fully lived. To put his point simply: it's better to be wet than dry." Schickel applauded the performances of Brad Pitt and Edward Norton, but he criticized the film's "conventionally gimmicky" unfolding and the failure to make Helena Bonham Carter's character interesting.[78]

Cineaste's Gary Crowds reviewed the critical reception in retrospect: "Many critics praised Fight Club, hailing it as one of the most exciting, original, and thought-provoking films of the year." He wrote of the negative opinion, "While Fight Club had numerous critical champions, the film's critical attackers were far more vocal, a negative chorus which became hysterical about what they felt to be the excessively graphic scenes of fisticuffs... They felt such scenes served only as a mindless glamorization of brutality, a morally irresponsible portrayal, which they feared might encourage impressionable young male viewers to set up their own real-life fight clubs in order to beat each other senseless." [79]

[edit] Accolades

Fight Club was nominated for the 2000 Academy Award for Best Sound Editing, but it lost to The Matrix.[80] Helena Bonham Carter won the 2000 Empire Award for Best British Actress.[81] The Online Film Critics Society also nominated Fight Club for Best Film, Best Director, Best Actor (Edward Norton), Best Editing, and Best Adapted Screenplay (Jim Uhls).[82] Though the film won none of the awards, the organization listed Fight Club as one of the top ten films of 1999.[83] The soundtrack was nominated for a BRIT Award, losing to Notting Hill.[84]

[edit] Cultural impact

Fight Club was one of the most controversial and talked-about films of the 1990s.[15][85] Like other 1999 films *Magnolia*, *Being John Malkovich*, and *Three Kings*, Fight Club was recognized as an innovator in cinematic form and style since it exploited new developments in filmmaking technology.[86] After Fight Club's theatrical release, it became more popular via word of mouth,[87] and the positive reception of the DVD established it as a cult film that David Ansen of Newsweek conjectured would enjoy "perennial" fame.[88][89] The film's success also heightened the profile of the novel's author, Chuck Palahniuk, to global renown.[90]

Following Fight Club's release, several fight clubs were reported to have started in the United States. A "Gentleman's Fight Club" was started in Menlo Park, California in 2000 and had members mostly from the high tech industry.[91] Teens and preteens in Texas, New Jersey, Washington state, and Alaska also initiated fight clubs and posted videos of their fights online, leading authorities to break up the clubs. In 2006, an unwilling participant from a local high school was injured at a fight club in Arlington, Texas, and the DVD sales of the fight led to the arrest of six teenagers.[92] An unsanctioned fight club was also started at Princeton University, where matches were held on campus.[93] The film was suspected of influencing Luke Helder, a college student who planted pipe bombs in mailboxes in 2002. Helder's goal was to create a smiley pattern on the map of the United States, similar to the scene in Fight Club in which a building is vandalized to have a smiley on its exterior.[94] On July 16, 2009, a 17-year-old who had formed his own fight club in Manhattan was charged with detonating a homemade bomb outside a Starbucks

Coffee shop in the Upper East Side in May 2009; the New York City Police Department reported the suspect was trying to emulate "Project Mayhem".[95]

In 2003, *Fight Club* was listed as one of the "50 Best Guy Movies of All Time" by *Men's Journal*.^[96] In 2004 and 2006, *Fight Club* was voted by *Empire* readers as the ninth and eighth greatest film of all time, respectively.^{[97][98]} *Total Film* ranked *Fight Club* as "The Greatest Film of our Lifetime" in 2007 during the magazine's tenth anniversary.^[99] In 2007, *Premiere* selected Tyler Durden's line, "The first rule of fight club is you do not talk about fight club," as the 27th greatest movie line of all time.^[100] In 2008, readers of *Empire* ranked Tyler Durden first on a list of the 100 Greatest Movie Characters.^[101]

In 2010, two viral mash-up videos featuring *Fight Club* were released. *Ferris Club* was a mash-up of *Fight Club* and the film *Ferris Bueller's Day Off*. It portrayed Ferris as Tyler Durden and Cameron as the narrator, "claiming to see the real psychological truth behind the John Hughes classic".^[102] The second video *Jane Austen's Fight Club* also gained popularity online as a mash-up of *Fight Club's* fighting rules and the characters created by 19th century novelist Jane Austen.^[103]

American Film Institute recognition:

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[edit] References

[edit] External links

The 1998 Pacific hurricane season was a moderately active Pacific hurricane season with seven tropical cyclones directly affecting land. The season officially started on May 15 in the eastern Pacific, and on June 1 in the central Pacific, and ended on November 30; these dates conventionally delimit the period during which most tropical cyclones form in the northeastern Pacific Ocean. The first tropical cyclone developed on June 11, which was about ten days later than the normal start of the season.[1] The final storm of the year, Hurricane Madeline, dissipated on October 20. Storm activity in the Central Pacific Ocean was low, with just one tropical depression forming in the basin. Two tropical cyclones from the Eastern Pacific, Darby and Estelle, also entered the central Pacific, with the former entering as a hurricane.

The season produced 13 named storms, which was slightly below the average of 16 named storms per season. However, the total of nine hurricanes during the season was equal to the average, and the total of six major hurricanes surpassed the average.[2]

The most notable tropical cyclone of the year was Hurricane Isis which killed fourteen people when it made landfall on southern Baja California and coastal Sinaloa in Mexico. Isis caused moderate damage in the nation, destroying more than 700 homes and damaging dozens of cars.[3] It later produced light rainfall and caused dozens of traffic accidents in the southwestern United States. In addition to Isis, Tropical Storm Javier made landfall on Mexico; the nation experienced the effects of other offshore storms, with six tropical cyclones having some impact on the country. One tropical cyclone, Hurricane Lester, affected Central America, and caused two deaths in Guatemala. Three tropical cyclones produced light to moderate rainfall across the southwestern United States, and one hurricane produced rough surf along the coast of California. Hurricane Madeline contributed to a costly and deadly flood in southern Texas.

[edit] Storms

[edit] Tropical Storm Agatha

A poorly defined tropical wave crossed Central America into the eastern Pacific Ocean on June 8. As it tracked westward under the influence of a ridge to its north, a broad circulation developed. Gradually, the dominant center of circulation became better defined, with increasingly organized convection and developing banding features.[1] By early on June 11, the center became sufficiently associated with the convection for the National Hurricane Center (NHC) to classify the system as Tropical Depression One-E. This occurred while the area of unsettled weather was about 460 miles (765 km) south-southwest of Acapulco, Mexico.[4]

The center of the depression was not initially well defined, with restricted outflow in the eastern half of the circulation.[4] As such, the depression failed to attain any significant organization in the days subsequent to its formation. Later, an approaching tropical wave merged with the depression, resulting in a trend of intensification and increased organization. By June 13, the NHC upgraded the depression to tropical storm status, and gave it the name "Agatha". Agatha was about 650 miles (1050 km) south-southeast of Cabo San Lucas when it became a tropical storm.[1] As Agatha became a tropical storm, forecasters predicted that it would not strengthen further, due to its forecast track passing over cooler waters.[5] However, Agatha quickly strengthened, developing a curved band of convection wrapping around its center,[6] and early on June 11 it attained a peak intensity of 65 mph (100 km/h) while about 615 miles (985 km) southwest of the southern tip of Baja California. Agatha maintained peak winds for about 12 hours before moving over colder waters and gradually weakening. On June 15, it degenerated back into a tropical depression, and a day later, it dissipated over the open waters of the Pacific Ocean. The storm never affected land.[1]

[edit] Tropical Depression Two-E

A few days later, another westward-moving tropical disturbance paralleled the southern coast of Central America and Mexico. Convection in the area organized steadily, and late on June 19, the system developed into Tropical Depression Two-E about 260 miles (420 km) south-southwest of Manzanillo, Mexico. On becoming a tropical depression, the system maintained a large, elongated, low-level circulation with some banding features and restricted outflow due to wind shear. The National Hurricane Center first predicted that the depression would intensify, reaching winds of 50 mph (80 km/h), though two computer models projected it to quickly dissipate. Under the influence of a ridge over Mexico, the depression moved to the west-northwest,[7] and, under the influence of increasing wind shear, the depression failed to organize significantly. By June 20, the circulation center was partially exposed, and was located to the northeast of the primary convection's traits that signal a weak storm. Two-E approached tropical storm status,[8] though deep convection waned after the system moved over cooler waters. On June 21, the National Hurricane Center issued the last advisory on the depression, stating that the depression maintained a very well-defined, low-level circulation, but had no convection associated with the system.[9] Locally heavy rains fell across southwest Mexico in association with this system, peaking at 5.55 inches (141 mm) at Las Gaviotas/Compostela.[10]

[edit] Hurricane Blas

On June 8, a tropical wave emerged off the coast of Africa. The wave remained weak and nondescript as it crossed the Atlantic Ocean and entered the eastern Pacific Ocean on June 19. An area of convection developed and organized along the wave's axis, and the National Hurricane Center began to employ Dvorak classifications on June 20. Convective banding features increased as the broad circulation became better defined, and on June 22, the disturbance developed into Tropical Depression Three-E about 575 miles (925 km) south of the Gulf of Tehuantepec. Well-defined steering currents resulted in a general west-northwestward movement. Deep convection concentrated near the center, and about 12 hours after becoming a tropical depression, the system strengthened into Tropical Storm Blas about 400 miles (640 km) south of Puerto Angel,

Oaxaca.[11]

Tropical Storm Blas continued to organize as it moved parallel to the Mexican coast. Banding features increased, and on June 23 the storm attained hurricane status about 345 miles (555 km) southwest of Acapulco. The next day, an eye developed and became apparent on satellite imagery, while upper-level outflow became better defined. Blas quickly strengthened and reached its peak intensity on June 25, with maximum sustained winds of 140 mph (225 km/h), while about 575 miles (925 km) south-southeast of the southern tip of Baja California. Temperatures warmed in the convection around the eye, though the eye remained visible for several days as Blas turned west under the influence of a ridge to its north. On June 28, it degenerated into a tropical storm after entering an area of cooler water. Blas weakened to a tropical depression on June 30, and a day later was considered to have dissipated due to a lack of convection near the center. A remnant low-level cloud swirl persisted for several days, passing well to the south of Hawaii on July 5 before dissipating. The Associated Press attributed 4 deaths from a mudslide in Michoacán to Blas. However, as the primary convection remained offshore, the National Hurricane Center did not consider the deaths related to the hurricane.[11] The threat of Blas prompted officials in Acapulco to close the port to all navigation.[12]

[edit] Tropical Storm Celia

On July 1, another tropical wave emerged off the coast of Africa. It moved westward due to strong wind shear without further organization, and crossed Central America into the eastern Pacific Ocean on July 11. An area of organizing convection developed along the wave axis, and Dvorak classifications began on July 13, while the tropical wave was south of the Gulf of Tehuantepec. The cloud pattern soon became disorganized, and the area of disturbed weather continued west-northwestward. On July 16, convection increased and organized into banding features; early on July 17, the system developed into Tropical Depression Four-E about 150 miles (240 km) south of Manzanillo, Mexico. Soon after becoming a tropical depression, the storm rapidly organized and intensified into Tropical Storm Celia six hours after becoming a tropical depression. The tropical storm initially moved northwestward, and briefly threatened southern Baja California. As a result, the government of Mexico issued a tropical storm warning on July 18 for La Paz southward. Shortly thereafter, a mid- to upper-level anticyclone turned Celia to the west-northwest and forced it to pass about 150 miles (240 km) south-southwest of Cabo San Lucas. On July 19, Celia attained maximum sustained winds of 60 mph (95 km/h) before moving over cooler waters and diminishing in convection. The storm degenerated into a tropical depression on July 20, and Celia dissipated early on July 21, well away from the Mexican coastline.[13]

The precursor tropical disturbance produced locally heavy rainfall along the south coast of Mexico.[13] Authorities in Mexico closed the port at Acapulco to small fishing and recreational boats, and advised larger craft to use caution.[14] Damage from the storm, if any, is unknown.

[edit] Hurricane Darby

A tropical wave moved off the coast of Africa on July 4. It tracked westward across the Atlantic Ocean with little increase in convection, and crossed Central America into the Pacific Ocean on July 16. Three days later, convection began to increase along the wave axis while the wave was well to the south of Acapulco, Mexico. On July 21, Dvorak classifications began as the cloud pattern displayed curvature on satellite images. Convective banding features gradually developed, and it is estimated that the system organized into Tropical Depression Five-E early on July 23 about 720 miles (1160 km) south of the southern tip of the Baja California peninsula. Under the influence of a mid- to upper-level ridge to its north, the depression tracked west-northwestward. Convection became more concentrated as outflow organized further, and 18 hours after the depression first developed, it intensified into Tropical Storm Darby.[15]

Located in an area conducive to further development, Darby attained hurricane status on July 24, subsequent to the development of a 17 mile (27 km)-wide

eye.[15] The eye became more distinct while surrounded by an area of deep convection, and on July 25 the hurricane reached peak winds of 115Â mph (185Â km/h) about 850Â miles (1370Â km) southwest of Cabo San Lucas.[16] The eye soon disappeared on satellite imagery, believed to be from an eyewall replacement cycle, and Darby's winds weakened to about 105Â mph (170Â km/h). A 25Â mile (40Â km) eye next developed, and on July 26, the hurricane re-intensified to reach peak winds of 115Â mph (185Â km/h).[15] For a 30-hour period, Darby attained the characteristics of an annular hurricane, retaining a well-defined structure with few banding features for an extended period.[17] The hurricane began to weaken while entering an area of cooler water and increased wind shear, and after crossing into the jurisdiction of the Central Pacific Hurricane Center, Darby weakened to a tropical storm on July 29. The storm degenerated into a tropical depression on July 31, and early on August 1, Darby dissipated a moderate distance north of the Hawaiian Islands. It never affected land.[15]

[edit] Hurricane Estelle

On July 18, a tropical wave exited the western coast of Africa, and moved westward across the Atlantic Ocean with sporadic convection but no development. The wave moved across the Caribbean Sea and the southern Gulf of Mexico before crossing Central America into the eastern Pacific Ocean on July 28. Early on July 29, Dvorak classifications began on the system, and subsequent to the formation of banding features and a surface circulation, the system developed into Tropical Depression Six-E about 170Â miles (275Â km) southeast of Manzanillo, Mexico. The depression continued to organize, with increasing convection and distinct upper-level outflow, and early on July 30 the depression intensified into Tropical Storm Estelle.[18]

Tropical Storm Estelle gradually intensified as it tracked west-northwestward, a motion caused by a large anticyclone to its north. On July 31, the storm attained hurricane status about 550Â miles (885Â km) south-southeast of the southern tip of Baja California. Its intensification continued as a well-defined eye about 30Â miles (48Â km) in diameter became visible on satellite imagery, and on August 2 Estelle reached its peak intensity of 135Â mph (215Â km/h). The hurricane soon began to weaken as deep convection diminished and the eye disappeared on satellite imagery. Two days after peaking in intensity, Estelle weakened to tropical storm status. Late on August 4, the convection associated with the storm dissipated, and the next day the storm weakened to tropical depression status. Convection briefly re-developed on August 6, though increased wind shear and cooler water weakened the depression further. Two days later, Estelle dissipated about 400Â miles (645Â km) east-northeast of the Hawaiian Islands.[18] High surf from Estelle impacted southern California, resulting in a number of lifeguard rescues.[19] The storm disrupted the trade winds around Hawaii, resulting in light winds and rain showers on Kauai and Oahu.[20]

[edit] Tropical Storm Frank

On July 19, a tropical wave moved off the coast of Africa. A mid-level circulation developed to the south of Cape Verde on July 22, though the wave became less distinct as it continued westward. The wave axis crossed Central America into the eastern Pacific Ocean on July 31. Convection steadily increased, though it was not until August 4 that the convection began to organize. Dvorak classifications began on August 4, and subsequent to the formation of a low-level circulation the system developed into Tropical Depression Seven-E on August 6 about 550Â miles (885Â km) south of the southern tip of the Baja California Peninsula. The depression tracked generally northward, under the influence of a ridge over Mexico and a mid-level trough to its west.[21] The center of the depression was initially elongated, with northerly wind shear impacting the structure of the cyclone.[22] This at first prevented further strengthening,[21] though convection increased and organized into banding features as it moved through an area of warm water.[23] On August 8, the depression intensified into Tropical Storm Frank, and it soon turned to the north-northwest, brushing the western coastline of Baja California. On August 9, Frank reached peak winds of 45Â mph (75Â km/h) about 105Â miles (170Â km)

west-northwest of Ciudad Constituci3n. It turned to the northwest, with a portion of the circulation of the land, and steadily weakened after moving over cooler water. On August 10, Frank dissipated a short distance off Baja California.[21]

On August 8, the government of Mexico issued a tropical storm warning for portions of the southwestern Baja California Peninsula.[21] Officials ordered the evacuation of some residents near Cabo San Lucas, whose port was closed, due to the threat of mudslides.[24] Gusty winds and moderate rainfall were reported in a localized area of Baja California Sur,[21] with rainfall peaking at 9.61 inches (244 mm) at Santa Anita, near Los Cabos.[25] Moisture from Frank extended into the southwestern United States,[21] producing more than 2 inches (50 mm) of rain in southern California and Arizona.[26] One news agency attributed three deaths to the storm,[27] though elsewhere there were no reports of damage.[21]

[edit] Hurricane Georgette

A tropical wave was first observed in the eastern Pacific Ocean on August 4 in association with the Intertropical Convergence Zone. It tracked westward, and by August 9 a low-level circulation formed well to the south of Mexico. Banding features increased as the system detached from the Intertropical Convergence Zone, and on August 11, the system developed into Tropical Depression Eight-E about 730 miles (1170 km) southwest of Acapulco.[28] On becoming a tropical cyclone, the depression maintained an area of concentrated deep convection near the center. The National Hurricane Center initially predicted that the depression would slowly intensify and reach winds of 70 mph (115 km/h) within 72 hours. For much of the rest of the storm's duration, the National Hurricane Center underestimated the intensity of the cyclone.[29]

The depression tracked steadily northwestward, caused by its location along the western periphery of a subtropical ridge. It would retain that direction for most of its remaining duration. Late on August 11, it intensified into Tropical Storm Georgette, and two days later it attained hurricane status after developing a 40 mile (65 km) eye about 615 miles (990 km) south-southwest of Cabo San Lucas.[28] The eye became increasingly distinct while banding features became very well organized.[30] Georgette attained peak winds of 115 mph (185 km/h) while centered 690 miles (1110 km) west-southwest of the southern tip of Baja California.[28] The hurricane soon moved over cooler water,[30] and began to weaken as convection warmed and decreased. On August 16, it degenerated into a tropical storm, and Georgette dissipated on August 17 without ever affecting land.[28]

[edit] Tropical Depression One-C

An area of convection developed in association with a northward bulge of the near-equatorial convergence zone. It tracked west-northwestward under the influence of a ridge to its north, and organized into Tropical Depression One-C on August 19, about 1000 miles (1600 km) southeast of the Hawaiian Islands. The depression failed to organize significantly as it turned westward. High wind shear from an upper-level trough continually weakened the system, and on August 19, the Central Pacific Hurricane Center issued the final advisory on the tropical depression about 365 miles (585 km) south of Hilo on the island of Hawaii. It never affected land.[20]

[edit] Hurricane Howard

A tropical wave moved off the coast of Africa on August 7. As it moved across the Atlantic Ocean, it failed to organize. On reaching the eastern Pacific Ocean on August 17, however, an area of convection developed along the wave axis. Dvorak classifications began the next day, and a broad center of circulation gradually formed. Convection was intermittent at first, though it gradually organized and persisted near the center, and on August 20, the disturbance developed into Tropical Depression Nine-E about 345 miles (555 km) south of Puerto Angel, Mexico. It tracked generally west-northwestward, developing more pronounced banding features, and on August 21, the depression intensified into Tropical Storm Howard. The center of Howard became embedded within the deep convection, and the storm quickly strengthened to attain

hurricane status late on the 21st. An eye developed as outflow organized further, and Howard began to rapidly intensify to reach peak winds of 150Â mph (240Â km/h) about 600Â miles (965Â km) south-southeast of the southern tip of Baja California. At the time of its peak intensity, the eye was small and located within a very cold central dense overcast.[31]

Shortly after peaking in intensity, the eye of Hurricane Howard gradually became larger, resulting in a slight weakening trend. After weakening to winds of 125Â mph (200Â km/h),[31] the eye reached a diameter of about 30Â miles (50Â km), and the structure of the hurricane transitioned into that of an annular hurricane, similar to that of Darby earlier in the season.[17] Howard strengthened again into a Category 4 hurricane on August 25 before weakening slightly the following day.[31] The hurricane retained annular characteristics for about 48Â hours before moving over cooler water.[17] On August 28, it weakened to a tropical storm, and early on August 30, Howard was considered to have dissipated. A small, low-level swirl of clouds devoid of convection persisted for a few days before dissipating. Howard never affected land.[31]

[edit] Hurricane Isis

Isis developed on September 1 out of the interaction between a tropical wave and a large, low-level circulation to the southwest of Mexico. It moved northward, striking the extreme southeastern portion of the Baja California Peninsula before attaining hurricane status in the Gulf of California. Isis made landfall at Topolobampo in the state of Sinaloa on September 3 and quickly lost its low-level circulation.[32] The remnants persisted for several days before dissipating in the US state of Idaho.[33]

In Mexico, Isis destroyed more than 700Â houses and killed 14Â people,[32] primarily due to heavy rainfall of more than 20Â inches (500Â mm) in southern Baja California Sur.[33] The rainfall caused widespread damage to roads and railways, stranding thousands of people.[34] Moisture from the remnants of Isis extended into the southwestern United States, resulting in light rainfall, dozens of traffic accidents, and power outages for thousands of residents in San Diego County.[35]

[edit] Tropical Storm Javier

Javier is believed to have originated from a tropical wave that moved off the coast of Africa on August 22. A convective disturbance along the northern portion of the wave developed into Atlantic Hurricane Danielle on August 24, while the southern portion of the wave axis continued westward. The wave remained inactive and difficult to track as it crossed the Atlantic. On September 3, an area of convection began to develop near Acapulco, at the same time and location where the wave would have been based on extrapolation. The disturbance became better defined on September 5 as it tracked west-northwestward, and on September 6 the convection became sufficiently organized and persistent for the National Hurricane Center to classify it as Tropical Depression Eleven-E, while it was located about 200Â miles (330Â km) southwest of Manzanillo, Mexico.[36]

Easterly wind shear initially dislocated the circulation center to the eastern edge of the convection. The subtropical ridge to its north resulted in a general west-northwest motion,[37] and the depression slowly intensified into Tropical Storm Javier late on September 7. Banding features in the system did not organize significantly, and on September 8, Javier attained a peak intensity of 60Â mph (95Â km/h), which coincided with a sharp increase in convection over the center. Steering currents soon weakened, and the storm turned to the east while convection quickly decreased. By September 9, the center was exposed from the diminishing deep convection, and that night it degenerated into a tropical depression. On September 11, the National Hurricane Center issued its final advisory on Javier, though later analysis indicates that it remained a tropical cyclone as it turned southeastward. At times, it became difficult to distinguish Javier from the broader area of disturbed weather that persisted over the tropical eastern Pacific, though a brief increase in convection and a ship report of winds exceeding 40Â mph (65Â km/h) indicate that Javier strengthened again into a tropical storm late on September

12. It turned to the northeast, and reached winds of 50Â mph (80Â km/h) before weakening due to waning convection. Javier made landfall about 35Â miles (55Â km) east-southeast of Cabo Corrientes early on September 14, and dissipated within 12Â hours of moving ashore. The National Hurricane Center advised small craft along coastal areas of Mexico to monitor the progress of the storm.[36]

Javier produced moderate rainfall along coastal regions of Mexico, including a 24-hour peak of 7.36Â inches (187Â mm) in Colima, 6.69Â inches (170Â mm) in MichoacÃn, and 3.34Â inches (85Â mm) in Jalisco. Puerto Vallarta reported the highest total rainfall, at 17.33Â inches (440Â mm).[38] Damage, if any, is unknown.[39]

[edit] Tropical Depression Twelve-E

A tropical disturbance developed persistent convection in association with a low-level circulation, and organized into Tropical Depression Twelve-E late on October 1 about 350Â miles (565Â km) west-northwest of Manzanillo, Mexico. Within an environment of weak steering currents, the depression was initially forecast to track slowly west-northwestward and reach winds of 60Â mph (95Â km/h), but instead it drifted eastward before turning slowly to the west.[40][41] The depression failed to organize and gradually worsened in appearance. Early on October 2, two ships reported southwest winds much further to the north, with the National Hurricane Center indicating that either the center was exceedingly small, that no center existed at the time, or that the center was located far to the north of the thunderstorm activity. Operationally, the center was relocated further to the north,[42] then relocated about 115 miles (185Â km) to the south six hours later based on visible satellite images,[43] then again relocated to the north, coinciding with officials issuing the last advisory on the system. By early October 3, the depression possessed only intermittent convection,[44] and later that day it dissipated to the southwest of the Baja California peninsula.[41] Heavy rains from its eastern periphery fell across southwest Mexico, with a maximum total of 6.34 inches (161Â mm) at Las Gaviotas/Compostela.[45]

[edit] Hurricane Kay

A small, low-level circulation separated itself from the Intertropical Convergence Zone on October 10, several hundred miles southwest of Baja California. The circulation was well defined, though its convection was initially minimal and disorganized. On October 12, the convection increased greatly, and the system was sufficiently organized to be classified Tropical Depression Thirteen-E early on October 13, about 715Â miles (1150Â km) southwest of Cabo San Lucas. Dvorak classifications also indicated winds of about 35Â mph (55Â km/h). Operationally, the depression was forecast to intensify to reach peak winds of 45Â mph (70Â km/h) while tracking steadily west-northwestward.[46]

The storm center was at first ill-defined,[47] and post-season analysis estimates that it intensified into Tropical Storm Kay about 6Â hours after developing. After becoming a tropical storm, Kay rapidly organized as it tracked generally westward. A pinhole eye developed in the center of the convection, and Kay attained hurricane status late on October 13, about 18Â hours after developing. After remaining a hurricane for about 12Â hours, the eye disappeared and the convection weakened, and early on October 14 Kay degenerated into a tropical storm. Within an environment of weak steering currents, the storm turned to the southwest, then to the south, after weakening to a tropical depression on October 15. Convection sporadically redeveloped, but failed to persist. Kay turned to the southeast and later to the east, and the system dissipated on October 17, about 330Â miles (530Â km) south-southwest of its origin. Kay never affected land.[48]

[edit] Hurricane Lester

A tropical wave moved off the coast of Africa on September 29, and on October 5, an area of convection along the wave developed into Atlantic Hurricane Lisa. The wave axis continued westward, and after crossing Central America convection increased as it tracked northwestward, and the system organized into Tropical Depression Fourteen-E on October 15, about 200Â miles (320Â km) south of Guatemala. It moved northwestward and late on the 15th it intensified into

Tropical Storm Lester, about 115 miles (185 km/h) south of the border of Mexico and Guatemala, before attaining hurricane status on October 16. Lester continued westward and strengthened to reach a peak intensity of 115 mph (185 km/h) on October 22. Late on October 23, it degenerated into a tropical storm, and several days later, Lester dissipated on October 26.[49]

Early in its lifetime, Lester produced heavy rainfall across southwestern Guatemala. The rainfall destroyed some houses and killed livestock, and a mudslide from the heavy precipitation killed two children.[50] In Honduras, rainfall from the hurricane destroyed a bridge in Tegucigalpa, affecting about 1,000 people.[51] Moisture brought around the northeast periphery of the Sierra Madre Occidental led to a narrow band of heavy rainfall along the upslope side of the mountain range, with a local precipitation maximum exceeding 14 inches (360 mm).[52] Though no surface reports are available, it is estimated that tropical-storm-force winds occurred along coastal areas of southern Mexico.[49]

[edit] Hurricane Madeline

A tropical wave moved off the coast of Africa on September 25, and remained disorganized while crossing the Atlantic Ocean before crossing Central America into the Pacific Ocean. It continued westward, and on October 15 began to steadily organize until developing into Tropical Depression Fifteen-E on October 16, about 230 miles (370 km) west-southwest of Manzanillo, Mexico. At the western end of a mid-level ridge, the depression tracked north-northwestward. 12 hours after first developing, the depression intensified into Tropical Storm Madeline. Banding features gradually improved in organization, and late on October 17, Madeline attained hurricane status. On October 18, Madeline attained peak winds of 85 mph (140 km/h) about 95 miles (150 km) southwest of San Blas, Nayarit. Late on October 19, the hurricane degenerated into a tropical storm, and early on October 20, Madeline dissipated in the southern portion of the Gulf of California.[53]

Some of the rainbands from Madeline moved over portions of southwest Mexico, with close to 9 inches (560 mm) falling at Cabo Corrientes.[54] No damage or casualties were reported as a result of the storm in Mexico.[53] Moisture from Madeline contributed to heavy rainfall across southeastern Texas, reaching over 22 inches (560 mm) in some locations. Thirty-one people died due to the flooding, and damage totaled \$750 million (1998 USD).[55]

[edit] Accumulated Cyclone Energy (ACE) ranking

ACE (104 kt²) ^ Storm

1
29.27
Howard
8
2.69
Isis
2
23.74
Lester
9
2.15
Kay
3
19.65
Blas
10
2.20
Agatha
4
18.31
Darby
11
2.02
Celia

5
14.6
Estelle
12
1.91
Javier
6
11.18
Georgette
13
0.77
Frank
7
5.49
Madeline
Total: 133

The table on the right shows the Accumulated Cyclone Energy (ACE) for each storm in the 1998 season. The ACE is, broadly speaking, a measure of the power of a storm multiplied by its duration, so longer-lived hurricanes have higher ACEs. The total ACE for the season was $133.97 \times 10^4 \text{ kt}^2$. Because several storms in 1998 were long-lasting or intense, the season's ACE was near-normal.[56] Hurricane Howard had the highest ACE, measuring $29.27 \times 10^4 \text{ kt}^2$.

[edit] Storm names

The following names were used for named storms that formed in the eastern Pacific in 1998. Names that were not assigned are in gray. No names were retired, so the list was used again in the 2004 season.

Agatha
Blas
Celia
Darby
Estelle
Frank
Georgette
Howard
Roslyn (unused)
Seymour (unused)
Tina (unused)
Virgil (unused)
Winifred (unused)
Xavier (unused)
Yolanda (unused)
Zeke (unused)

For storms that form in the Central Pacific Hurricane Center's area of responsibility, encompassing the area between 140 degrees west and the International Date Line, all names are used in a series of four rotating lists. The next four names that were slated for use in 1998 are shown below, however none of them were used.

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[edit] External links

The Puerto Rican Amazon (*Amazona vittata*), also known as the Puerto Rican Parrot or Iguaca, is the only bird endemic to the archipelago of Puerto Rico belonging to the Neotropical genus *Amazona*. Measuring 28Â ~30Â cm (11.0Â ~11.8Â in), the bird is a predominantly green parrot with a red forehead and white rings around the eyes. Two subspecies have been described, although there are doubts regarding the distinctiveness of the form *gracilipes* from Culebra Island, extinct since 1912. Its closest relatives are believed to be the Cuban Amazon (*Amazona leucocephala*) and the Hispaniolan Amazon (*Amazona ventralis*).

The Puerto Rican Amazon reaches sexual maturity between three and four years of age. It reproduces once a year and is a cavity nester. Once the female lays eggs she will remain in the nest and continuously incubate them until hatching. The chicks are fed by both parents and will fledge 60 to 65 days after hatching. This parrot's diet is varied and consists of flowers, fruits, leaves, bark and nectar obtained from the forest canopy.

The species is the only remaining native parrot in Puerto Rico and has been listed as critically endangered by the World Conservation Union since 1994. Once widespread and abundant, the population declined drastically in the 19th and early 20th centuries with the removal of most of its native habitat; the species completely vanished from Vieques and Mona Island, nearby to the main island of Puerto Rico. Conservation efforts commenced in 1968 to save the bird from extinction. In 2006, the total estimated population was 34 to 40 individuals in the wild and 143 individuals in captivity.[2]

[edit] Taxonomy and evolution

The Puerto Rican Amazon was described by Dutch ornithologist Pieter Boddaert in 1783. It belongs to the large Neotropical genus *Amazona*, commonly known as amazons; these birds have also been given the generic epithet of 'parrot' by the American Ornithologists' Union, hence Puerto Rican Parrot is an alternative common name in North America.[3] The indigenous Taíno people called it the Iguaca, an onomatopoeic name that resembled the parrots' flight call.[4]

There are two recognized subspecies:

A. v. vittata is the nominate and only extant subspecies, inhabiting Puerto Rico and formerly nearby Vieques Island and Mona Island.[5]

A. v. gracilipes inhabited Culebra Island and is now extinct. It is unclear whether it was substantially different from the nominate subspecies.

[edit] Evolutionary history

A. albifrons

A. agilis

A. collaria

A. ventralis

A. leucocephala

A. vittata

Phylogeny of the Greater Antillean Amazona after Russello and Amato, 2004.

There is no evidence that the West Indies were connected to a continent in the past, and thus the various native bird species are assumed to be descended from those that immigrated to the Caribbean at some point. Some small species would have encountered problems traversing large bodies of water, but parrots have flight strength and various behavioral characteristics that would facilitate "over-water" dispersion.[6] Most Caribbean bird species originate from Central, North and South America.[7] The Amazona species found in the Caribbean are divided in two groups: five mid-sized species found in the Greater Antilles and seven large species in the Lesser Antilles.[8] All the Greater Antillean Amazons display characteristics leading to suppositions of relatedness, including predominantly green-toned color patterns and white rings around the eyes.[8] Russello and Amato conclude that all Greater Antillean Amazona descend from Amazona albifrons with Amazona vittata, Amazona leucocephala, and Amazona ventralis constituting a complex, a cluster of species so closely related that they intergrade.[9]

British ornithologist David Lack considered that the Puerto Rican Amazon had evolved from the Hispaniolan Amazon (*A. ventralis*) found in Hispaniola, but it has since been argued that he omitted some elements in his analysis, including the similarities found between the Black-billed Amazon (*A. agilis*) of Jamaica and the Puerto Rican Amazon.[10] Subsequent studies showed that size and color patterns were not sufficient to assess evolutionary relationships, and that patterns changed with relative ease even within members of the same species.[10] The research concluded that the Puerto Rican Amazon may share a common ancestor with the Jamaican *A. agilis*. [11] Recent phylogenetic studies show that the Puerto Rican Amazon is more closely related to the Hispaniolan Amazon and the Cuban Amazon than to the Black-billed Amazon.[12]

[edit] Description

The Puerto Rican Amazon measures 28âˆ³30Â cm (11.0âˆ³11.8Â in) and weighs 250âˆ³300Â g (8.8âˆ³10.6Â oz), or 275Â g (9.7Â oz) on average. Although small compared to Amazons in general, it is similar in size to other Greater Antilles Amazona species. Sexual dimorphism is not present. Both males and females have predominantly green plumage, though their feathers have blue edges. The primary flight feathers of the wings and the main covert feathers are dark blue. The color of the feathers on the underside varies depending on the body part: the feathers on the underside of the wings, which can be seen during flight, are bright blue; those in the tail have yellow-green tone. Their underparts are paler and yellow-tinged, their foreheads are red, and they have white ovals around the eyes. The iris is brown, the bill a horn color, and the legs yellow-tan.[13] Aside from DNA tests, males and females can only be distinguished by behavioral differences during the breeding season. Immature birds have plumage similar to adults.[13]

[edit] Population and distribution

The precise distribution of the Puerto Rican Amazon before the arrival of Spanish colonialists is uncertain, because of a lack of contemporary records and then the extermination of the indigenous Taíno people, but the species was apparently widespread and abundant.[14] There is also evidence the species may have inhabited other nearby islands, such as Antigua, Barbuda[15] and the

Virgin Islands.[16][17] Estimates of the parrot's early numbers vary greatly. Some authorities claim that there were once more than a million individuals,[18] while others suggest a more modest population of 100,000. During the first 150 years of Spanish rule the human population was small, and in 1650, when the population of the island was 880 people, the species was still abundant throughout the archipelago.[19] After 1650, human habitation increased exponentially, and by the 18th century the Puerto Rican Amazon population started to be affected. Heinrich Moritz Gaede, a German naturalist, declared that by 1836 the parrot population had noticeably declined.[20] Even so, as late as 1864, British ornithologist Edward Cavendish Taylor noted that the parrots were still common near the island's capital, San Juan.[20]

At first, human activity had not posed a significant threat to the Puerto Rican Amazon. The Taíno hunted the parrot but without much effect on its population.[21] In the past two hundred years, however, many factors have led to a drastic decrease in the birds' numbers: agricultural development, the construction of roads, hydroelectric development, and the adoption of young chicks as pets.[22] Especially during the latter half of the 19th century, most of Puerto Rico's virgin forests, a historical habitat of the species, were cleared for agricultural development, primarily for the production of sugar, cotton, corn and rice. The Amazon quickly came to rely on these crops as its main food source and so became seen as a pest; local farmers repelled or hunted the bird if possible.[23] As agriculture expanded, the Amazon's habitat disappeared further and its population declined.

The species was historically found in mature or old-growth forests in Puerto Rico at all elevations, and in holes, cliffs, and other diverse habitats at lower elevations. The species could be found at medium elevations in the Guajataca State Forest (until 1910) and the Rio Abajo State Forest (until the 1920s), and at high elevations in the Carite State Forest (until the 1930s).[24] Accounts from the early 1900s describe the parrots traveling away from the Luquillo forest and the Sierra de Cayey towards the main island's coast to find food.[14] At the same time, the species was extirpated from Puerto Rico's smaller islands—Culebra, Vieques and Mona—and became restricted to five locations: two in karst-limestone areas, two in high montane rainforests and one in mangrove forest at the foot of the El Yunque National Forest. One of these karst regions, located in the northwestern part of Puerto Rico, was identified as a haven for the species. In particular, a region named Valle de las Cotorras (Valley of the Parrots), located between San Sebastián and Morovis, was home to a sizable population. Some Amazons survived in small pockets of degraded forest but these proved insufficient to support large colonies. Eventually their natural habitat was reduced to the Cordillera Central and undisturbed forest areas, and by 1940 they were only to be found in primary forest at the Luquillo Mountains in El Yunque National Forest. The species is currently found at elevations between 396 and 823 m (1,299 and 2,700 ft). Since the species requires mature forests with open-cavity trees for reproduction, it does not occur in dwarf and secondary forests.

By the 1950s, there were only 200 parrots in the wild, and in 1975 the population reached an absolute low of 13 individuals. Numbers then recovered, and in August 1989 there were an estimated minimum of 47 individuals. But on September 18, 1989, Hurricane Hugo struck the northeast coast of Puerto Rico inflicting heavy casualties on the remaining birds. In the aftermath of the hurricane the population was estimated at 23 individuals. In 2004, the wild population was 30–35 individuals, and the long-term trend appears to be stable albeit with some fluctuations.[2][25] The current range of the species is 16 km² (6.2 sq mi), 0.2% of what it once was.[1]

[edit] Behavior

The Puerto Rican Amazon is diurnal, typically beginning its day half an hour after sunrise.[26] It is generally secretive when inside its nest, using its green plumage as camouflage. In contrast, it may be vocal and noisy when outside the nest. Upon taking flight, its color pattern provides some contrast to the forest. The flight mechanism of this species is similar to the one found

in other Amazons, and involves strokes below the body axis, unlike most birds whose wings flow above their bodies in flight. Amazons can fly moderately fast, reaching a top speed of approximately 30 km/h (19 mph), and are fairly agile when evading predators in mid-air.[27] When in search of food, the parrots group in pairs. Couples and their fledged young display a tendency to stay together.[28] The Amazon makes two flight calls, a take-off squawk which consist of a pattern of long squawks, and a loud "bugle", commonly used in flight and which may have several meanings depending on the circumstances when it is used.[29]

Like almost all Amazons, the Puerto Rican Amazon is a herbivore. Its diet consists of flowers, fruits, leaves, bark and nectar obtained from the forest's canopy. The species has been recorded to consume more than 60 different materials, although its diet was historically more varied due to its larger range. Among the items it consumes are the pericarp of the seeds of sierra palm (*Prestoea montana*), tabonuco (*Dacryodes excelsa*), and negra lora (*Matayba domingensis*); the fruits of bejuco de rana (*Marcgravia sintenisii*), camasey (*Miconia sintenisii*), cupey de altura (*Clusia gundlachii*), and palo de cruz (*Rheedia portoricensis*); the flowers of bejuco de rana, achiotillo (*Alchornea latifolia*), and *Piptocarpha tetrantha*; the leaves and twigs of cupeillo (*Clusia grisebachiana*), laurel sabino (*Magnolia splendens*), caimitillo verde (*Micropholis garciniaefolia*), and *Piptocarpha tetrantha*; the bark of bejuco de rana, cupeillo, and cachimbo cumun (*Psychotria berteriana*); and the buds of cuaba (*Inga vera*).[30] It normally selects the fruits positioned directly in front of its eyes, picking them one at a time with some rare exceptions.[31] When feeding, it uses a foot to pick up the food.[32] The Amazon feeds in a slow, paused manner taking 8 to 60 seconds to consume separate items.[33]

[edit] Breeding

The Puerto Rican Amazon usually mates for life, with pairs only changing mates if one bird perishes or abandons the nest.[34] A male may abandon the female if the latter is injured, re-mating with a more "physically perfect" subject.[34] The pairing process is unknown; however, new pairs tend to participate in mutual mating dances characterised by coordinated bows, partial extension of the wings and full tail expansion.[35]

The Puerto Rican Amazon is a secondary cavity nester, nesting in tree trunk cavities, both naturally occurring and excavated by other species. It prefers to nest in Palo colorado trees (*Cyrilla racemiflora*), but uses other trees, including the laurel sabino (*Magnolia splendens*) and tabonuco (*Dacryodes excelsa*), to a lesser extent. These trees are mature cavity-forming trees which provide protection against predators and the entry of water. Recently, the species has also nested in artificial wooden boxes designed as part of the recovery plan for the species. Nest height varies from 7 to 15 m (23 to 49 ft) above ground. The male usually leads the search for nest sites, although the final decision seems to be taken by the female.[36] Once a site is selected, the pair will spend some time inspecting and cleaning it. No lining material is added to the nest.

The Puerto Rican Amazon reaches sexual maturity at 4 years of age in the wild and at 3 years in captivity. The species usually reproduces once a year between the months of January and July (the dry season). Copulation between pairs seems to be closely related to food transfers, with this possibly serving as a trigger for intercourse.[37] Amazons have a copulation pattern similar to that found in other parrots throughout the Americas, with the male gripping a perch with one leg while passively placing the other in the female's back.[38] As the time for egg-laying approaches the pair spends more time in the nest, with the male providing food to the female via regurgitation.[39] The female lays 2 to 4 eggs that she exclusively incubates for a period of 24 to 28 days, while the male will be present in the vicinity of the nest when providing food.[40] Females only leave the nest on rare occasions involving repelling predators or if the male has not brought food in an extended time frame.[41] The chicks are fed by both parents until they leave the nest, usually 60 to 65 days after they hatch.[2] Nonetheless, they remain dependent on their parents and travel with

them until the next breeding season.[3]

Like other Amazons, the Puerto Rican Amazon is gregarious while performing daily activities, but territorial around its nest.[42] The size of the territory around the nest is usually around 50 meters (164 feet).[5] Pairs are extremely cautious near their nest, usually moving in a slow manner when leaving the nest to avoid the attention of predators.[43] Although territorial defense is mostly composed of loud vocalizations there are instances of actual physical combat.[44] Pairs will defend their nest sites against invading couples, sometimes focusing on the location's defense instead of egg-laying. Pairs nesting in areas uninhabited by other parrots will remain mostly silent unless other parrots enter the zone.[44] Some pairs may display moderate territoriality even when not apparently intending to nest, with these tendencies beginning in the latter half of the breeding season. One hypothesis is that this would occur in young pairs that had still not reached full maturity, serving as "practice territoriality".[45]

[edit] Threats and conservation

On March 11, 1967, the Puerto Rican Amazon entered the United States Fish and Wildlife Service list of endangered species.[46] At the time of inclusion the population was estimated at 70 individuals. In 1968, recovery efforts began to increase the population in the wild.[47] In 1972, when the estimated population was 16 individuals, the United States Fish and Wildlife Service (USFWS) at the Luquillo Aviary began efforts to breed parrots in captivity and yielded good results. In June 2006, it was reported by the USFWS that its birds in captivity had successfully hatched 39 chicks (the yearly average is around 16). In 2006, 22 birds were released in the Rio Abajo State Forest to initiate a second wild population, and a further 19 were released at the same site on 27 December 2008.[48]

The World Conservation Union (IUCN) lists the Puerto Rican Amazon as a critically endangered species since 1994.[1] The species is regulated under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),[49] rendering illegal international trade in specimens or parts.

[edit] Threats

Human activity is arguably the main reason for the population decline of the Puerto Rican Amazon.[18] Early settlers of Puerto Rico, such as the Taíno, hunted it for food consumption but managed to maintain a healthy ecological balance. Later, habitat destruction, capture of immature individuals for the pet industry, hunting and predation contributed to the sharp population decline. The clearing of mature forests for agricultural development is the main reason for the decline of population.

Natural predators of the Puerto Rican Amazon include the Red-tailed Hawk (*Buteo jamaicensis*), the Broad-winged Hawk (*Buteo platypterus*), the Peregrine Falcon (*Falco peregrinus*) and the Pearly-eyed Thrasher (*Margarops fuscatus*).[2][16] The thrasher invaded Puerto Rico in the mid-20th century and has been a problem for the parrot population since 1973; to combat this, specially designed deep nests were prepared for the parrots in subsequent years to prevent competition from the invaders.[50] Introduced honeybees (*Apis mellifera*), the related Hispaniolan Amazon (*Amazona ventralis*), Black rats (*Rattus rattus*) and Indian mongooses (*Herpestes javanicus*) may compete for nesting cavities, and the latter two may eat eggs and chicks.[25]

Natural disasters, such as hurricanes, were not a threat to the Puerto Rican Parrot population when it was more readily self-maintaining, but as a result of the fragmentation and reduction of the population these disasters are now a threat as well. Hurricane Hugo passed through the species' range in September 1989, and reduced the population from 47 to 23 individuals.[51]

[edit] Recovery plan

In response to the Puerto Rican Amazon's low population and endangered status, a recovery plan was drafted and implemented in 1968. Its main objective was to downlist the species to threatened status by the year 2020.[18] Other objectives included establishing two separate viable wild populations (each of

which would consist of 500 or more individuals for a period of at least five years), protecting habitat for those populations, and controlling predators, parasites and competitors. A third site was planned in 2011 by the Caribbean Islands National Wildlife Refuge Complex.[52]

As part of the conservation efforts, a captive population was established in the Luquillo Aviary in 1973.[18] Another was established in 1993 when some individuals were transferred from the Luquillo Aviary to the Rio Abajo State Forest under the administration of the Puerto Rican Department of Natural Resources (Departamento de Recursos Naturales y Ambientales).[53] In 2007, expanded facilities at the Iguaca Aviary at the El Yunque National Forest were inaugurated and dedicated to the late Priscilla Stubbe, who was a major fundraiser for the new facility.[54]

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 ^ Snyder et al., p. 68
 ^ Snyder et al., p. 70
 ^ Snyder et al., pp. 81â ^83
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 ^ Snyder et al., p. 82
 ^ a b Snyder et al., p. 131
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 ^ Snyder et al., p. 141
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 ^ Snyder et al., p. 148
 ^ Snyder et al., p. 155
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[edit] References

[edit] External links

Bryce Canyon National Park (pron.: /ˈbr̩ɪtʃˈæns/) is a national park located in southwestern Utah in the United States. The major feature of the park is Bryce Canyon, which despite its name, is not a canyon but a collection of giant natural amphitheaters along the eastern side of the Paunsaugunt Plateau. Bryce is distinctive due to geological structures called hoodoos, formed by frost weathering and stream erosion of the river and lake bed sedimentary rocks. The red, orange, and white colors of the rocks provide spectacular views for park visitors. Bryce sits at a much higher elevation than nearby Zion National Park.

The rim at Bryce varies from 8,000 to 9,000 feet (2,400 to 2,700 m).

The Bryce Canyon area was settled by Mormon pioneers in the 1850s and was named after Ebenezer Bryce, who homesteaded in the area in 1874.[3] The area around Bryce Canyon became a National Monument in 1923 and was designated as a National Park in 1928. The park covers 35,835 acres (55.99 sq mi; 145.02 km²)[1] and receives relatively few visitors compared to Zion National Park and the Grand Canyon, largely due to its remote location.

[edit] Geography and climate

Bryce Canyon National Park is located in southwestern Utah about 50 miles (80 km) northeast of and 1,000 feet (300 m) higher than Zion National Park.[4][5] The weather in Bryce Canyon is therefore cooler, and the park receives more precipitation: a total of 15 to 18 inches (38 to 46 cm) per year.[6][7] Yearly temperatures vary from an average minimum of 9 °F (−13 °C) in January to an average maximum of 83 °F (28 °C) in July, but extreme temperatures can range from −30 °F to 97 °F (−34 °C to 36 °C).[7] The record high temperature in the park was 98 °F (37 °C) on July 14, 2002. The record low temperature was −28 °F (−33 °C) on December 10, 1972.[8]

The national park lies within the Colorado Plateau geographic province of North America and straddles the southeastern edge of the Paunsagunt Plateau west of the Paunsagunt Fault (Paunsagunt is Paiute for "home of the beaver").[9] Park visitors arrive from the plateau part of the park and look over the plateau's edge toward a valley containing the fault and the Paria River just beyond it (Paria is Paiute for "muddy or elk water"). The edge of the Kaiparowits Plateau bounds the opposite side of the valley.

Bryce Canyon was not formed from erosion initiated from a central stream, meaning it technically is not a canyon. Instead headward erosion has excavated large amphitheater-shaped features in the Cenozoic-aged rocks of the Paunsagunt Plateau.[9] This erosion exposed delicate and colorful pinnacles called hoodoos that are up to 200 feet (61 m) high. A series of amphitheaters extends more than 20 miles (32 km) north-to-south within the park.[9] The largest is Bryce Amphitheater, which is 12 miles (19 km) long, 3 miles (4.8 km) wide and 800 feet (240 m) deep.[9] A nearby example of amphitheaters with hoodoos in the same formation but at a higher elevation, is in Cedar Breaks National Monument, which is 25 miles (40 km) to the west on the Markagunt Plateau.[5]

Rainbow Point, the highest part of the park at 9,105 feet (2,775 m),[10] is at the end of the 18-mile (29 km) scenic drive.[9] From there, Aquarius Plateau, Bryce Amphitheater, the Henry Mountains, the Vermilion Cliffs and the White Cliffs can be seen. Yellow Creek, where it exits the park in the north-east section, is the lowest part of the park at 6,620 feet (2,020 m).[7]

[edit] Human history

[edit] Native American habitation

Little is known about early human habitation in the Bryce Canyon area. Archaeological surveys of Bryce Canyon National Park and the Paunsagunt Plateau show that people have been in the area for at least 10,000 years. Basketmaker Anasazi artifacts several thousand years old have been found south of the park. Other artifacts from the Pueblo-period Anasazi and the Fremont culture (up to the mid-12th century) have also been found.[11]

The Paiute Indians moved into the surrounding valleys and plateaus in the area around the same time that the other cultures left.[11] These Native Americans hunted and gathered for most of their food, but also supplemented their diet with some cultivated products. The Paiute in the area developed a mythology surrounding the hoodoos (pinnacles) in Bryce Canyon. They believed that hoodoos were the Legend People whom the trickster Coyote turned to stone.[12] At least one older Paiute said his culture called the hoodoos Anka-ku-was-a-wits, which is Paiute for "red painted faces".[11]

[edit] European American exploration and settlement

It was not until the late 18th and the early 19th century that the first European Americans explored the remote and hard-to-reach area.[11] Mormon scouts visited the area in the 1850s to gauge its potential for agricultural development, use for grazing, and settlement.[11]

The first major scientific expedition to the area was led by U.S. Army Major John Wesley Powell in 1872.[11] Powell, along with a team of mapmakers and geologists, surveyed the Sevier and Virgin River area as part of a larger survey of the Colorado Plateaus. His mapmakers kept many of the Paiute place names.[9]

Small groups of Mormon pioneers followed and attempted to settle east of Bryce Canyon along the Paria River. In 1873, the Kanarra Cattle Company started to use the area for cattle grazing.[11]

The Church of Jesus Christ of Latter-day Saints sent Scottish immigrant Ebenezer Bryce and his wife Mary to settle land in the Paria Valley because they thought his carpentry skills would be useful in the area. The Bryce family chose to live right below Bryce Canyon Amphitheater. Bryce grazed his cattle inside what are now park borders, and reputedly thought that the amphitheaters were a "helluva place to lose a cow." [3] He also built a road to the plateau to retrieve firewood and timber, and a canal to irrigate his crops and water his animals. Other settlers soon started to call the unusual place "Bryce's canyon", which was later formalized into Bryce Canyon.

A combination of drought, overgrazing and flooding eventually drove the remaining Paiutes from the area and prompted the settlers to attempt construction of a water diversion channel from the Sevier River drainage. When that effort failed, most of the settlers, including the Bryce family, left the area.[9] Bryce moved his family to Arizona in 1880.[7] The remaining settlers dug a 10 miles (16 km) ditch from the Sevier's east fork into Tropic Valley.[9]

[edit] Creation of the park

These scenic areas were first described for the public in magazine articles published by Union Pacific and Santa Fe railroads in 1916.[3] People like Forest Supervisor J. W. Humphrey promoted the scenic wonders of Bryce Canyon's amphitheaters, and by 1918 nationally distributed articles also helped to spark interest.[11] However, poor access to the remote area and the lack of accommodations kept visitation to a bare minimum.

Ruby Syrett, Harold Bowman and the Perry brothers later built modest lodging, and set up "touring services" in the area.[11] Syrett later served as the first postmaster of Bryce Canyon. Visitation steadily increased, and by the early 1920s the Union Pacific Railroad became interested in expanding rail service into southwestern Utah to accommodate more tourists.[11]

At the same time, conservationists became alarmed by the damage overgrazing and logging on the plateau, along with unregulated visitation, were having on the fragile features of Bryce Canyon. A movement to have the area protected was soon started, and National Park Service Director Stephen Mather responded by proposing that Bryce Canyon be made into a state park. The governor of Utah and the Utah Legislature, however, lobbied for national protection of the area. Mather relented and sent his recommendation to President Warren G. Harding, who on June 8, 1923 declared Bryce Canyon National Monument into existence.[11]

A road was built the same year on the plateau to provide easy access to outlooks over the amphitheaters. From 1924 to 1925, Bryce Canyon Lodge was built from local timber and stone.[13]

Members of U.S. Congress started work in 1924 on upgrading Bryce Canyon's protection status from a U.S. National Monument to a National Park in order to establish Utah National Park.[13] A process led by the Utah Parks Company for transferring ownership of private and state-held land in the monument to the federal government started in 1923.[11] The last of the land in the proposed park's borders was sold to the federal government four years later, and on February 25, 1928, the renamed Bryce Canyon National Park was established.[14]

In 1931, President Herbert Hoover annexed an adjoining area south of the park, and in 1942 an additional 635 acres (2.57 km²) was added.[11] This brought the park's total area to the current figure of 35,835 acres (145.02 km²).[14] Rim Road, the scenic drive that is still used today, was completed in 1934 by the Civilian Conservation Corps. Administration of the park was conducted from neighboring Zion Canyon National Park until 1956, when Bryce Canyon's first superintendent started work.[11]

[edit] More recent history

The USS Bryce Canyon was named for the park and served as a supply and repair ship in the U.S. Pacific Fleet from September 15, 1950, to June 30, 1981.[15]

Bryce Canyon Natural History Association (BCNHA) was established in 1961.[16] It runs the bookstore inside the park visitor center and is a non-profit organization created to aid the interpretive, educational and scientific activities of the National Park Service at Bryce Canyon National Park. A portion of the profits from all bookstore sales are donated to public land units.

Responding to increased visitation and traffic congestion, the National Park Service implemented a voluntary, summer-only, in-park shuttle system in June 2000. In 2004, reconstruction began on the aging and inadequate road system in the park.

[edit] Geology

The Bryce Canyon area shows a record of deposition that spans from the last part of the Cretaceous period and the first half of the Cenozoic era. The ancient depositional environment of the region around what is now the park varied. The Dakota Sandstone and the Tropic Shale were deposited in the warm, shallow waters of the advancing and retreating Cretaceous Seaway (outcrops of these rocks are found just outside park borders).[17] The colorful Claron Formation, from which the park's delicate hoodoos are carved, was laid down as sediments in a system of cool streams and lakes that existed from 63 to about 40 million years ago (from the Paleocene to the Eocene epochs). Different sediment types were laid down as the lakes deepened and became shallow and as the shoreline and river deltas migrated.

Several other formations were also created but were mostly eroded away following two major periods of uplift. The Laramide orogeny affected the entire western part of what would become North America starting about 70 million to 50 million years ago.[14] This event helped to build the Rocky Mountains and in the process closed the Cretaceous Seaway. The Straight Cliffs, Wahweap, and Kaiparowits formations were victims of this uplift. The Colorado Plateaus were uplifted 16 million years ago and were segmented into different plateaus, each separated from its neighbors by faults and each having its own uplift rate.[10] The Boat Mesa Conglomerate and the Sevier River Formation were removed by erosion following this uplift.

Vertical joints were created by this uplift, which were eventually (and still are) preferentially eroded. The easily eroded Pink Cliffs of the Claron Formation responded by forming freestanding pinnacles in badlands called hoodoos, while the more resistant White Cliffs formed monoliths.[9] The brown, pink and red colors are from hematite (iron oxide; Fe_2O_3); the yellows from limonite ($\text{FeO}(\text{OH}) \cdot n\text{H}_2\text{O}$); and the purples are from pyrolusite (MnO_2).[18] Also created were arches, natural bridges, walls, and windows. Hoodoos are composed of soft sedimentary rock and are topped by a piece of harder, less easily eroded stone that protects the column from the elements. Bryce Canyon has one of the highest concentrations of hoodoos of any place on Earth.

The formations exposed in the area of the park are part of the Grand Staircase. The oldest members of this supersequence of rock units are exposed in the Grand Canyon, the intermediate ones in Zion National Park, and its youngest parts are laid bare in Bryce Canyon area. A small amount of overlap occurs in and around each park.

[edit] Biology

More than 400 native plant species live in the park. There are three life zones in the park based on elevation:[13] The lowest areas of the park are dominated by dwarf forests of pinyon pine and juniper with manzanita, serviceberry, and antelope bitterbrush in between. Aspen, cottonwood, Water Birch, and Willow grow along streams. Ponderosa Pine forests cover the mid-elevations with Blue Spruce and Douglas-fir in water-rich areas and manzanita and bitterbrush as underbrush. Douglas-fir and White Fir, along with Aspen and Engelmann Spruce, make up the forests on the Paunsaugunt Plateau. The harshest areas have Limber Pine and ancient Great Basin Bristlecone Pine, some

more than 1,600 years old, holding on.[12]

The forests and meadows of Bryce Canyon provide the habitat to support diverse animal life, from birds and small mammals to foxes and occasional bobcats, mountain lions, and black bears.[12] Mule deer are the most common large mammals in the park.[12] Elk and pronghorn, which have been reintroduced nearby, sometimes venture into the park.[12]

Bryce Canyon National Park forms part of the habitat of three wildlife species that are listed under the Endangered Species Act: the Utah Prairie Dog, the California Condor, and the Southwestern Willow Flycatcher.[19] The Utah Prairie Dog is a threatened species that was reintroduced to the park for conservation, and the largest protected population is found within the park's boundaries.[20]

About 170 species of birds visit the park each year, including swifts and swallows.[7] Most species migrate to warmer regions in winter, although jays, ravens, nuthatches, eagles, and owls stay.[12] In winter, the mule deer, mountain lion, and coyotes migrate to lower elevations.[12] Ground squirrels and marmots pass the winter in hibernation.[12]

Eleven species of reptiles and four species of amphibians have been found at in the park.[21] Reptiles include the Great Basin Rattlesnake, Short-horned Lizard, Side-blotched Lizard, Striped Whipsnake, and the Tiger Salamander.[21]

Also in the park are the black, lumpy, very slow-growing colonies of cryptobiotic soil, which are a mix of lichens, algae, fungi, and cyanobacteria. Together these organisms slow erosion, add nitrogen to soil, and help it to retain moisture.

While humans have greatly reduced the amount of habitat that is available to wildlife in most parts of the United States, the relative scarcity of water in southern Utah restricts human development and helps account for the region's greatly enhanced diversity of wildlife.

[edit] Activities

Most park visitors sightsee using the scenic drive, which provides access to 13 viewpoints over the amphitheaters. Bryce Canyon has eight marked and maintained hiking trails that can be hiked in less than a day (round trip time, trailhead):[22] Mossy Cave (one hour, State Route 12 northwest of Tropic), Rim Trail (5 to 6 hours, anywhere on rim), Bristlecone Loop (one hour, Rainbow Point), and Queens Garden (1 to 2 hours, Sunrise Point) are easy to moderate hikes. Navajo Loop (1 to 2 hours, Sunset Point) and Tower Bridge (2 to 3 hours, north of Sunrise Point) are moderate hikes. Fairyland Loop (4 to 5 hours, Fairyland Point) and Peekaboo Loop (3 to 4 hours, Bryce Point) are strenuous hikes. Several of these trails intersect, allowing hikers to combine routes for more challenging hikes.

The park also has two trails designated for overnight hiking: the 9-mile (14 km) Riggs Spring Loop Trail and the 23-mile (37 km) Under-the-Rim Trail.[23] Both require a backcountry camping permit. In total there are 50 miles (80 km) of trails in the park.

More than 10 miles (16 km) of marked but ungroomed skiing trails are available off of Fairyland, Paria, and Rim trails in the park. Twenty miles (32 km) of connecting groomed ski trails are in nearby Dixie National Forest and Ruby's Inn.

The air in the area is so clear that on most days from Yovimpa and Rainbow points, Navajo Mountain and the Kaibab Plateau can be seen 90 miles (140 km) away in Arizona.[24] On extremely clear days, the Black Mesas of eastern Arizona and western New Mexico can be seen some 160 miles (260 km) away.[24]

The park also has a 7.4 magnitude night sky, making it one of the darkest in North America.[25] Stargazers can therefore see 7,500 stars with the naked eye, while in most places fewer than 2,000 can be seen due to light pollution (in many large cities only a few dozen can be seen). Park rangers host public stargazing events and evening programs on astronomy, nocturnal animals, and night sky protection. The Bryce Canyon Astronomy Festival, typically held in June, attracts thousands of visitors. In honor of this astronomy festival, Asteroid 49272 was named after the national park.[26]

There are two campgrounds in the park, North Campground and Sunset Campground.[27] Loop A in North Campground is open year-round. Additional loops

and Sunset Campground are open from late spring to early autumn. The 114-room Bryce Canyon Lodge is another way to overnight in the park.[28]

A favorite activity of most visitors is landscape photography. With Bryce Canyon's high altitude and clean air, the sunrise and sunset photographs can be spectacular.

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[edit] External links

Suillus spraguei is a species of fungus in the Suillaceae family. It is known by a variety of common names, including the painted slipperycap, the painted suillus or the red and yellow suillus. *Suillus spraguei* has had a complex taxonomical history, and is also frequently referred to *Suillus pictus* in the literature. The readily identifiable fruit bodies have caps that are dark red when fresh, dry to the touch, and covered with mats of hairs and scales that are separated by yellow cracks. On the underside of the cap are small, yellow, angular pores that become brownish as the mushroom ages. The stalk bears a grayish cottony ring, and is typically covered with soft hairs or scales.

Suillus spraguei grows in a mycorrhizal association with several pine species, particularly eastern white pine, and the fruit bodies grow on the ground, appearing from early summer to autumn. It has a disjunct distribution, and is found in eastern Asia, northeastern North America, and Mexico throughout the range of the host tree. The mushroom is edible, although opinions about its quality vary. The mushroom bears a resemblance to several other *Suillus* species, including the closely related *S. decipiens*, although the species can be differentiated by variations in color and size.

[edit] Taxonomy, phylogeny, and naming

Suillus spraguei has had a complex taxonomic history. Although the first specimen was originally collected in New England in 1856 by Charles James Sprague, a formal scientific description was not published until 1872 when Miles Joseph Berkeley and Moses Ashley Curtis called it *Boletus spraguei*. In a publication that appeared the following year, American mycologist Charles Horton Peck named the species *Boletus pictus*. Berkeley and Curtis had also described what they believed to be a new species ~*Boletus murrainii*~ although this was later considered by Rolf Singer to be merely a younger version of their *Boletus spraguei*. [6] Although Peck's description appeared in print in 1873, the date stamp on the original publication revealed that he had sent his documents to the printer before the appearance of the 1872 Berkeley and Curtis publication, thus establishing nomenclatural priority under the rules of fungal naming. [7] However, in 1945 Singer reported that the name *Boletus pictus* was illegitimate because it was a homonym, already being used for a polypore mushroom described by Carl Friedrich Schultz in 1806. [6] [nb 1] The name was officially switched to *Suillus spraguei* in 1986 (Otto Kuntze had previously transferred the taxon to *Suillus* in 1898). [5] [nb 2]

A 1996 molecular analysis of 38 *Suillus* species used the sequences of their internal transcribed spacers to infer phylogenetic relationships and clarify the taxonomy of the genus. The results indicate that *S. spraguei* is most closely related to *S. decipiens*. The species *S. granulatus* and *S. placidus* lie

on a branch sister to that containing *S. spraguei*. [12] These results were corroborated and extended in later publications that assessed the relationships between Asian and eastern North American isolates of various *Suillus*, including *S. spraguei*. The analysis supported the hypothesis that Chinese and U.S. *S. spraguei* and *S. decipiens* were each others' closest relatives, and the clade that contained them could be divided into four distinct subgroups: *S. decipiens*, U.S. *S. spraguei*, China (Yunnan) *S. spraguei*, and China (Jilin) *S. spraguei*. [13][14]

The specific epithet *spraguei* is an homage to the collector Sprague, while *pictus* means "painted" or "colored". [15] *Suillus spraguei* is commonly known as the "painted slipperycap", [16] the "painted *suillus*", or the "red and yellow *suillus*". [17] It is also called the "eastern painted *Suillus*" to contrast with the "western painted *Suillus*" (*Suillus lakei*). [18]

[edit] Description

The cap of the fruit body is 3 to 12 cm (1.2 to 4.7 in) in diameter, and depending on its age, is either conic to convex, to somewhat flattened at maturity. The cap margin is initially rolled downward before straightening out, often with hanging remnants of partial veil (appendiculate). [19] The cap surface is covered with densely matted filaments that are rough and scale-like. The scales are pink to brownish red, fading to a pale brown-gray or dull yellow in maturity. Under the scales, the cap surface is yellow to pale yellow-orange. While many other *Suillus* species have a sticky or slimy cap, *S. spraguei* is dry. The flesh is yellow. [20]

The cap surface has scales or mats of reddish hairs; in this older specimen the scales have separated somewhat, exposing more yellow flesh underneath.

The partial veil is beginning to tear, exposing the pore surface.

The pores on the underside of the cap are yellowish and angular, measuring 0.5 to 5 mm (0.02 to 0.20 in) wide, and formed by tubes that extend 4 to 8 mm (0.2 to 0.3 in) deep. [19] These pores have a slightly decurrent attachment to the stem (extending down its length). Young specimens have a whitish fibrous partial veil that protects the developing pores; as the cap expands it rips the veil, which remains as a grayish ring on the stem. The stem is 4 to 12 cm (1.6 to 4.7 in) long, and 1 to 2.5 cm (0.4 to 1.0 in) thick, roughly cylindrical in shape, or sometimes with a bulbous bottom so as to be somewhat club-shaped. [19][20] The stem surface is tomentose, with scales at the top, and a ring on the upper half of the stem. Below the ring the stem is fibrillose, covered with a mat of soft hairs. Its color at the top is yellow, but with wine-red to reddish-brown scales below, underlaid with a pale yellow to grayish color. [20] The stem is usually solid, rarely hollow. [16] The tissue of all parts of the fruit body—cap, pores, and stem—will turn brownish shortly after being bruised or injured. [17][20]

In deposit, such as with a spore print, the spores of *S. spraguei* appear olive-brown in color, [21] although this changes to clay or tawny-olive after drying. [22] Microscopically, the spores have smooth surfaces, measuring 9–11 by 3–4.5 μm ; in side profile they have asymmetrical sides and a suprahilar depression (a surface indentation formed where the spore attaches to the basidia), while in face view they appear oblong. The spores are not amyloid, meaning that they do not absorb iodine when stained with Melzer's reagent. [23] The basidia (the spore-bearing cells in the hymenium) are thin-walled, four-spored, and have dimensions of 17–19 by 5–7.8 μm . In the presence of potassium hydroxide, they appear hyaline (translucent), and they become pale yellow to nearly hyaline in Melzer's reagent. [5]

Various parts of the mushroom display characteristic color reactions to chemical tests commonly used in mushroom identification. The cap cuticle will turn a blackish color with the application of a drop of potassium hydroxide (KOH), iron sulfate (FeSO₄) solution, or ammonia solution. The mushroom flesh turns grayish-green to greenish black with a drop of FeSO₄, and olive to greenish black with KOH or NH₄OH.[19]

[edit] Edibility

Suillus spraguei is an edible mushroom.[23] Its taste is not distinctive, although the odor has been described as "slightly fruity".[20] Although it turns a blackish color when cooked,[21] some consider it choice,[15] and "among the better edibles in the genus *Suillus*." [21] In contrast, another source on mushrooms of QuÃ©bec described the mushroom as a poor edible ("comestible mÃ©diocre"), and warned of a slightly acidic taste and disagreeable flavor.[24] Michael Kuo's 2007 book 100 Edible Mushrooms rates the taste as mediocre, suggesting "its sluglike consistency has all the palatability of unflavored gelatin." The book recommends frying the thinly-sliced mushroom in butter or oil until it acquires a crispy texture.[18]

[edit] Similar species

S. spraguei is a popular edible among novice mushroom hunters as it is readily identifiable due to both its appearance and its association with White Pine. Although this distinctiveness renders it unlikely to be confused with other species,[17] it does share similar characteristics with several other *Suillus* species. *S. spraguei* bears some resemblance to the rosy larch bolete (*S. ochraceoroseus*),[25] but the latter species has a darker spore print, a thicker stem, and grows in association with larch.[26] *S. cavipes*, another associate of larch trees, is more brownish and has a hollow stalk.[27] *S. lakei* is less brightly colored than *S. spraguei*, has a shorter stalk, and usually grows with Douglas fir.[28] *S. decipiens* has a less intensely red cap when young, but the color of older specimens fade and can resemble *S. spraguei*. *S. decipiens* generally has a smaller stature, with a cap ranging from 4 to 7 cm (1.6 to 2.8 in) in diameter, and stem that is typically 4 to 7 cm (1.6 to 2.8 in) long by 0.7 to 1.6 cm (0.3 to 0.6 in) thick. Further, its pores are irregular in shape, measuring 0.5 to 1 mm in diameter at maturity, and stain a shade of hazel rather than reddish to brownish. It is found in the southeastern United States, from New Jersey south to Florida and west to Texas.[29]

[edit] Ecology, habitat and distribution

In nature, *Suillus spraguei* forms ectomycorrhizal relationships with five-needled pine species.[30] This is a mutually beneficial relationship where the hyphae of the fungus grow around the roots of the trees, enabling the fungus to receive moisture, protection and nutritive byproducts of the tree, and affording the tree greater access to soil nutrients. *S. spraguei* produces tuberculate ectomycorrhizae (covered with wart-like projections) that are described as aggregates of ectomycorrhizal roots encased in a fungal rind, and rhizomorphs that are tubular fungal cords with a hard outer sheath.[30] The fungus has ecological host specificity, and in natural soils can only associate with white pine, a grouping of trees classified in subgenus *Strobus* of the genus *Pinus*. [31] However, under controlled pure culture conditions in the laboratory, *S. spraguei* has also been shown to form associations with Red Pine, Pitch Pine, and Loblolly Pine.[32] Asian populations have been associated with Korean Pine, Chinese White Pine,[13] Siberian Dwarf Pine and Japanese White Pine.[33] In North America, fruit bodies appear earlier than most other boletes, as early as June (bolete fruit bodies generally begin to appear in July to September),[34] although they may be found as late as October.[17] Mushrooms can be parasitized by the fungus *Hypomyces completus*. In the asexual stage of *H. completus*, it appears initially as patches of whitish mold on the surface of the cap or stem that rapidly spread to cover the entire mushroom surface and produce conidia (asexual spores). In the sexual stage, the mold changes color, progressing from yellow-brown to brown, greenish-brown and eventually black as it makes perithecia, asci-containing sexual structures that produce ascospores. The perithecia are pimply and give the surface a roughened

texture.[35]

A Japanese field study found that *S. spraguei* was the dominant fungus in a 21-year-old stand of Korean Pine, both in terms of ectomycorrhizae (measured as percentage of biomass present in soil samples) and by fruit body production (comprising over 90% of dry weight of total fruit bodies collected of all species). The production of *S. spraguei* fruit bodies averaged about one per square meter, without much variance during the four-year study period. The mushrooms appeared mostly from August to November, tended to grow in clumps, and the spatial distribution of clumps was random ~the location of the clumps was not correlatable with appearances in previous years. The density of mushrooms along a forest road was higher than average, suggesting a preference for disturbed habitat.[36] The results also suggested that *S. spraguei* prefers to produce fruit bodies in areas with low litter accumulation, a finding corroborated in a later publication. This study also determined that the fungus propagates mainly by vegetative growth (extension of underground mycelia), rather than by colonization of spores.[37]

Suillus spraguei has a disjunct distribution[38] and is known from several localities in Asia, including China,[39] Japan,[40] Korea,[41] and Taiwan.[42] In North America, its range extends from eastern Canada (Nova Scotia)[20] south to the Carolinas, and west to Minnesota.[19] It has also been collected in Mexico (Coahuila and Durango).[38] Furthermore, the species has been introduced to Europe (Germany, Lower Saxony).[43]

^ According to Streinz (1862), *Boletus pictus* Schultz is probably the same species as *Polyporus perennis* (L.) Fr.,[5] currently known as *Coltricia perennis*. [8]

^ Although Palm and Stewart consider Kuntze responsible for the transfer to *Suillus*, other authorities, including the taxonomic databases Index Fungorum[9] and MycoBank,[10] instead cite Smith and Thiers' 1964 monograph on North American species of *Suillus*. [11]

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The 2009 World Series was the 105th[1] edition of Major League Baseball's (MLB) championship series. The best-of-seven playoff was contested between the Philadelphia Phillies, champions of the National League (NL) and defending World Series champions, and the New York Yankees, champions of the American League (AL). The Yankees defeated the Phillies, four games to two, to win the franchise's 27th World Series championship. The series was played between October 28 and November 4, broadcast on Fox, and watched by an average of roughly 19Â million viewers.

Home field advantage for the Series went to the AL for the eighth straight year as a result of its 4â ^3 win in the All-Star Game. The Phillies earned their berth into the playoffs by winning the National League East. The Yankees won the American League East to earn their berth, posting the best record in the Major Leagues. The Phillies reached the World Series by defeating the Colorado Rockies in the best-of-five National League Division Series, and the Los Angeles Dodgers in the best-of-seven Championship Series (NLCS). The Yankees defeated the Minnesota Twins in the American League Division Series and the Los Angeles Angels of Anaheim in the Championship Series (ALCS) to advance to their first World Series since 2003.

Cliff Lee brought the Phillies victory in Game 1, allowing only one unearned run during his complete game win. Solo home runs by Mark Teixeira and Hideki Matsui helped the Yankees win Game 2 by a score of 3-1. After a rain delayed start, Game 3 featured more offense, with a combined six home runs and thirteen total runs en route to a Yankee victory. The Yankees won Game 4 after scoring the decisive three runs in the ninth inning, helped by Johnny Damon's baserunning. The Phillies avoided elimination by winning Game 5 on the back of Utley's second two-home run game of the series. The Yankees secured their World Series victory by winning Game 6 aided by Matsui's third home run of the series. He was named Most Valuable Player of the series, making him the first Japanese-born player and the first full-time designated hitter to win the award. He won the award despite the fact that he was only a starter for the three games that were played at Yankee Stadium, since the designated hitter position is not used in National League ballparks.

Several records were tied, extended, or broken during this World Series, including team championships (Yankees with 27), career postseason wins (Andy Pettitte with 18), career saves in the World Series (Mariano Rivera with 11), home runs in a World Series (Chase Utley with 5), strikeouts by a hitter in a World Series (Ryan Howard with 13), and RBI in a single World Series game (Hideki Matsui with 6).

[edit] Route to the series

[edit] Philadelphia Phillies

During the off-season the Phillies named Ruben Amaro, Jr. general manager, replacing Pat Gillick who retired at the end of a three-year contract.[2] Their most notable offseason player change was in left field, as Pat Burrell departed due to free agency and was replaced by free agent Rafael Ibáñez.[3] Another notable acquisition was free agent pitcher Chan Ho Park.[4] Park was originally signed as a backup option for the bullpen, as reliever J. C. Romero was assigned a 50-game suspension after violating the Major League Baseball drug policy, but Park won the fifth starter's job in Spring Training.[5][6]

During the regular season, the Phillies led the National League East for most of the year, taking first place for good on May 30.[7] The Phillies made one large acquisition at the trade deadline, trading four minor league players to the Cleveland Indians for pitcher Cliff Lee and outfielder Ben Francisco.[8] Lee won seven of his twelve regular season starts for Philadelphia in 2009.[9] Ibáñez had started the year strongly, batting well over .300 with 17 home runs and 46 runs batted in (RBI) in the first two months of the season, which led the New York Post to call him an "early MVP candidate".[10][11] He was placed on the disabled list in mid-June for a groin injury, however, and though he returned he did not bat above .260 for any other month that season.[10][12] Although Ibáñez did not receive MVP votes his teammates Ryan Howard and Chase Utley had successful years, finishing 3rd and 8th in the balloting respectively.[13] The Phillies finished the season with a record of 93-69 (.574), six games above the second-place Florida Marlins in their division.[7]

The Phillies defeated the wild card-winning Colorado Rockies in the National League Division Series (NLDS), three games to one, advancing to the National League Championship Series (NLCS).[7] Facing the Los Angeles Dodgers, the Phillies won the NLCS, four games to one,[7] becoming the first team to repeat as National League champions since the 1995-96 Atlanta Braves.[14] Ryan Howard won the NLCS MVP for his strong offensive performance during the series.[15] Howard tied Lou Gehrig's postseason record by having at least one RBI in eight straight games across the NLDS and NLCS.[15] They became the first World Series champion to return to the World Series the following year since the 2000-01 New York Yankees.[1]

[edit] New York Yankees

The Yankees' offseason began in November 2008 with control over their organization shifting from long-time owner George Steinbrenner to his son Hal Steinbrenner.[16] Notable player departures included Mike Mussina who announced his retirement on November 20, 2008[17] as well as Bobby Abreu,[18] Jason Giambi,[19] and Carl Pavano,[20] who all left as free agents. Notable free

agent acquisitions included starting pitchers CC Sabathia and A. J. Burnett, and first baseman Mark Teixeira. Another major addition was outfielder Nick Swisher, acquired in a trade with the Chicago White Sox.[21]

The Yankees played the 2009 season in Yankee Stadium, their first year in that park after playing for 84 years in "Old" Yankee Stadium.[22] They won the American League East with an eight-game lead over their rivals, the Boston Red Sox, compiling a record of 103-59.[23] Sabathia won 19 games and position players Alex Rodriguez and Teixeira both had strong seasons offensively, Rodriguez with 30 home runs and 100 RBI and Teixeira with 39 and 122 respectively.[23] Closing pitcher Mariano Rivera earned his 500th save against the Yankees' cross-town rival New York Mets, becoming the second pitcher in history to do so.[24] On September 11, 2009, shortstop Derek Jeter recorded his 2,722nd career hit, passing Lou Gehrig to become the all-time leader in career hits recorded as a Yankee.[25]

The Yankees defeated the Minnesota Twins in three games in the American League Division Series and the Los Angeles Angels of Anaheim in six games in the American League Championship Series (ALCS)[23] to win their first American League pennant since 2003.[14] Sabathia was named MVP of the ALCS with two wins in the series.[26] The Yankees' victory in the ALCS earned them their 40th World Series appearance in franchise history, and their first since losing to the Florida Marlins in 2003.[27]

[edit] Series preview

How great would that be? A World Series here, us against the Yankees? We've proved we can put on a pretty good show.

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â "

Jimmy Rollins, discussing the potential of a Yankees-Phillies World Series on May 24, 2009.[28]

The two teams had met for a three-game interleague series at Yankee Stadium in May 2009, with the Phillies winning two of the three games.[29] The series included two blown saves by Phillies' closer Brad Lidge in games 2 and 3, although the Phillies came back to win the final game in extra innings.[29]

The Yankees had home field advantage for the Series as the American League had won that year's All-Star Game.[30] The team match-up was heavily discussed and analyzed in the media prior to the beginning of the series. Both teams' offensive lineups were heavily touted,[31][32][33][34] with the Yankees and Phillies leading their respective leagues in runs scored per game.[35] Yankees third baseman Alex Rodriguez drew particular focus in the media for his success in earlier rounds of the 2009 playoffs in contrast to past postseason performances.[36][37][38] The two lineups featured twenty former All-Stars and three former MVP award winners.[32] Only one regular starter between both teams, Phillies catcher Carlos Ruiz, did not have at least ten home runs during the 2009 regular season.[32] The two teams combined for 468 home runs during the season, more than any pair of opponents in World Series history.[32]

The pitching staffs were also the subject of significant discussion prior to the series.[33] The starting pitchers for Game 1, CC Sabathia and Cliff Lee, were described as "aces"[34] who "dominated" the 2009 postseason with a 0.96 earned run average (ERA) between them.[39] This matchup was of particular note, as Sabathia and Lee were former teammates from the Cleveland Indians and each had won a Cy Young Award with that franchise.[39][40][41] Yankees manager Joe Girardi had been using a three-man starting rotation during the playoffs, in contrast to the four-pitcher rotation used by the Phillies.[42][43] This difference led USA Today to give the Phillies' starting rotation the "edge" in the series, as the World Series had one fewer day off than previous rounds of

the playoffs, making it more conducive to the Phillies' strategy.[43] Gene Wojciechowski of ESPN criticized Girardi's strategy, arguing that Chad Gaudin should have pitched in Game 5 or 6, instead of A. J. Burnett or Andy Pettitte on reduced, three days rest.[44] Wojciechowski argued that while Sabathia had proven his ability to pitch on shorter rest, Burnett and Pettitte should have been given their regular time between starts.[44] Burnett had drawn some criticism, as he performed poorly in his last appearance before the World Series,[39] a start in Game 5 of the ALCS in which he allowed six runs over six innings.[45] Some believed Girardi settled on a three-man rotation because he had limited options for a fourth starting pitcher, either Gaudin or Joba Chamberlain, who had been "erratic" as a starter in the regular season and had been shifted into the bullpen for the postseason.[44][46][47]

The matchup of closers, Mariano Rivera and Brad Lidge, also drew attention. Rivera and Lidge were the only closers who had not blown a save during the 2009 postseason, whereas closers on other postseason teams blew 11 saves in the 24 postseason games before the World Series in 2009.[48] Both had performed well during the postseason, but Lidge had posted a 7.21 ERA during the 2009 regular season, in contrast to Rivera's 1.76.[48][49] As a result, USA Today gave the Yankees the edge, noting that Lidge had blown two saves against the Yankees during their regular season series earlier that year.[43]

[edit] Series summary

The Series started on October 28, 2009, which was the latest start in World Series history.[50] Game 4 was played on Sunday, November 1 and the series-winning Game 6 took place on November 4. The Series was only the third to end in a month other than October. The first came in 1918, which was played entirely in September after the regular season was cut short due to World War I.[51] The other such series was in 2001 when the September 11 attacks caused a delay in the baseball season that eventually forced the end of the World Series into November.[52]

Earlier in the season Commissioner Bud Selig expressed interest in scheduling a World Series game during daylight hours instead of the evening.[53] The starting times were ultimately moved before 8 p.m. ET for the first time in 30 years, but no day games were played.[54][55] The Philadelphia Eagles and New York Giants of the National Football League (NFL) played across the street from Citizens Bank Park at Lincoln Financial Field on the day of Game 4. The NFL moved that game's kickoff time to 1 p.m. to avoid it ending too close to the start of Game 4.[56] Similarly, Game 5 was played at Citizens Bank Park on the same day as the Philadelphia Flyers hosted the Tampa Bay Lightning of the National Hockey League (NHL) at the Wachovia Center. The opening faceoff of the hockey game was scheduled for 7 p.m. but the NHL moved it to 5 p.m. to avoid conflict.[57]

The umpires for the series were Joe West, Dana DeMuth, Gerry Davis, Brian Gorman, Jeff Nelson, and Mike Everitt.[58] The World Series crew had included at least 1 umpire who had never worked the World Series in 24 of the past 25 series; however, following several mistakes by umpires in earlier rounds of the playoffs, this crew did not.[59][60][61]

The Phillies had won the previous season's World Series against the Tampa Bay Rays for the franchise's second championship. The Yankees lost their previous World Series appearance to the Florida Marlins in 2003 and had not won since 2000 against the New York Mets. This was the fifth Series played between teams from New York and Philadelphia, and was the first Yankees–Phillies matchup since 1950.[62] The series was also the fourth consecutive time that the Phillies faced a team from the current AL East in the World Series, while the Yankees had faced a NL East opponent in three of their four most recent World Series appearances.[1] This Series was nicknamed the "Turnpike Series", for the New Jersey Turnpike, which connects New York to Philadelphia through the state of New Jersey.[31] Major League Baseball nicknamed it the "Liberty Series", based on the Liberty Bell in Philadelphia and the Statue of Liberty in New York.[63]

[edit] Game 1

Line score for Wednesday, October 28, 2009, 7:57Â p.m. (ET) at Yankee Stadium in The Bronx, New York

Prior to the game, First Lady Michelle Obama and Second Lady Jill Biden escorted former Yankees catcher and World War II veteran Yogi Berra to the mound, where the ceremonial first pitch was thrown by a veteran of the Iraq War.[64] The Phillies' Ryan Howard got the first hit of the 2009 World Series by doubling in the first inning.[65] Howard was stranded in the first and the game was scoreless after two innings.[65] The Phillies scored first with a two-out solo home run by Chase Utley in the top of the third inning.[65] Through the first five innings, Philadelphia starting pitcher Cliff Lee allowed no runs and three hits, striking out seven Yankees batters.[65] In the top of the sixth, Utley hit another solo home run to give the Phillies a 2â ^0 lead.[65] The starting pitchers Lee and CC Sabathia continued to pitch until the top of the eighth when Sabathia was replaced by Phil Hughes.[65] Hughes walked the first two batters and was replaced by DÃ;maso MartÃ©.[65] MartÃ© got two quick outs and was relieved by David Robertson, who walked Jayson Werth and gave up a two-run single to RaÃºl IbÃ¡Ã±ez.[65] The Phillies added two more runs in the ninth with an RBI single by Shane Victorino and an RBI double by Howard.[65] Lee finished with a complete game allowing one unearned run on six hits and striking out ten batters, not walking any of the hitters he faced.[65]

Lee's pitching performance made history in several ways:[66]

This was the fourth postseason start of Lee's career. In all four starts, he went at least seven innings and gave up no more than one earned run. The only other starting pitcher ever to begin his postseason career with four such starts was Christy Mathewson.

He was also the first left-handed starter to beat the Yankees in The Bronx to open a World Series since Sandy Koufax in 1963.

He was the first starting pitcher to throw a complete game without giving up an earned run against the Yankees in GameÂ 1 of a postseason series.

Lee was the first pitcher ever to strike out at least ten, walk no one, and give up no earned runs in a World Series start.

[edit] Game 2

Line score for Thursday, October 29, 2009, 7:57Â p.m. (ET) at Yankee Stadium in The Bronx, New York

Prior to the game, Jay-Z and Alicia Keys performed the song "Empire State of Mind" for the Yankee Stadium crowd.[67] This game marked the first postseason appearance of Pedro MartÃ­nez against the Yankees since the 2004 American League Championship Series, when he was with the Boston Red Sox and a part of the two teams' long standing rivalry.[68] The Phillies scored first for the second game in a row, with RaÃºl IbÃ¡Ã±ez hitting a ground rule double and then scoring on a Matt Stairs RBI single off A. J. Burnett in the second inning.[69]

Mark Teixeira tied the game with a solo home run in the fourth inning, and Hideki Matsui broke the tie in the sixth with another solo homer.[69] MartÃ­nez departed the game after giving up consecutive hits to Jerry Hairston, Jr. and Melky Cabrera to start the seventh inning, and reliever Chan Ho Park gave up an RBI single to Jorge Posada.[70] With Cabrera at second base and Posada at first, Johnny Damon hit a low line drive at Phillies first baseman Ryan Howard. Howard grabbed the ball and threw to second where Posada was tagged and called out while standing on the base. First-base umpire Brian Gorman ruled that Howard had caught the ball in the air and thus the result was an inning-ending double play. This was the first of two calls by Gorman in this game which were later shown to have been wrong by video replays.[71][72][73][74]

Burnett left after seven innings and was replaced by Mariano Rivera in the eighth.[69] The Phillies put two runners on with a walk to Jimmy Rollins and a single by Shane Victorino with one out in the eighth.[69] However, Chase Utley grounded into an inning-ending double play[69] ending on a close play at first base, the second close call made by the first base umpire Brian Gorman. Gorman himself later admitted he missed this call, saying "on a freeze frame, it looks like thereâ s a little bit of a ball outside his glove when he hits the bag." [74] Ultimately, Rivera threw 39 pitches and got six outs for his 38th

postseason save, his tenth in World Series play.[75]

[edit] Game 3

Line score for Saturday, October 31, 2009, 9:17Â p.m. (following 1:20 rain delay) (ET) at Citizens Bank Park in Philadelphia, Pennsylvania

The start of the game was postponed 80 minutes due to a rain delay, pushing the start time to 9:17Â p.m.[76] The cast of the television series Glee performed the national anthem prior to the game as part of a ceremony featuring a large American flag and several members of the armed services.[77][78] The Phillies scored first with Jayson Werth's lead-off solo home run, which was followed by a bases-loaded walk and a sacrifice fly to make the score 3â ^0 in the bottom of the second inning.[79] Following Mark Teixeira's walk in the top of the fourth inning, Alex Rodriguez hit a deep ball down the right field line. It was originally ruled a double and Teixeira held at third base. The play was reviewed using MLB instant replay, which revealed that the ball had struck a camera sticking over the top of the wall, and the ball was ruled a two-run home run,[80] giving Rodriguez his first World Series hit.[81] This was the first home run reviewed by instant replay in postseason play.[80] Specifically, the ball hit a camera owned by Fox and MLB which extended slightly over the right field wall.[80] The camera was moved back for GameÂ 4 such that its lens was in line with the wall.[80] Coincidentally, Alex Rodriguez also had the first regular season home run reviewed by replay.[82]

Nick Swisher opened the top of the fifth inning with a double and scored on a single to center field by Andy Pettitte.[79] This was Pettitte's first career postseason RBI and the first RBI by a Yankees pitcher in a World Series since Jim Bouton in 1964.[83] Derek Jeter followed Pettitte with another single, and both runners scored on a two-run double by Johnny Damon.[79] Cole Hamels then walked Teixeira and was relieved by J.Â A. Happ. Happ closed out the fifth without allowing further scoring, but Nick Swisher added to the Yankees lead with a solo home run off of him in the sixth.[79] Werth hit his second solo home run of the game leading off the bottom of the sixth to close the Yankees lead to 6â ^4,[79] becoming the second Phillies player to hit multiple home runs in this World Series.

Chad Durbin relieved Happ in the top of the seventh. He walked Johnny Damon, who then stole second base. Rodriguez was then hit by a pitch, and Damon scored on a single by Jorge Posada.[79] Joba Chamberlain relieved Pettitte in the bottom of the seventh and retired the side in order. Brett Myers retired the first two batters in the top of the eighth, but Hideki Matsui then hit a solo home run pinch hitting for Chamberlain.[84] Phil Hughes pitched a third of an inning in the bottom of the ninth and allowed a solo home run to Carlos Ruiz before being relieved by Mariano Rivera.[79] Rivera closed out the game, throwing just five pitches to record the final two outs.[79] This game was Pettitte's 17th career postseason win, extending his MLB record.[83]

[edit] Game 4

Line score for Sunday, November 1, 2009, 8:20Â p.m. (ET) at Citizens Bank Park in Philadelphia, Pennsylvania

Prior to the start of the game, Derek Jeter and Albert Pujols were named winners of the Hank Aaron Award for their offensive performances in 2009.[85] This was the first game to test manager Joe Girardi's decision to use a three-man starting rotation, as CC Sabathia started the game on three days rest, a shorter period than he normally got during the regular season.[86] Jeter led the game off with a single and advanced to third base on a double by Johnny Damon.[87] Jeter scored via a Mark Teixeira ground out and Alex Rodriguez was hit by a pitch.[87] Rodriguez was hit twice the night before and the umpires issued warnings to both benches.[88] Jorge Posada then added to the Yankees lead that inning with a sacrifice fly.[87] The Phillies answered quickly, scoring a run on successive doubles by Shane Victorino and Chase Utley in the bottom of the first.[87] Sabathia intentionally walked Jayson Werth, but escaped the inning without further scoring.[87] The Phillies tied the game in the bottom of the fourth as Ryan Howard singled, stole second, and scored on a single by Pedro Feliz.[87] Although the run counted, instant replay of Howard's

slide later showed that he did not touch home plate.[89][90]

Nick Swisher walked to lead off the fifth inning and advanced to second on a Melky Cabrera single.[87] Swisher restored the Yankees' lead, scoring on a single by Jeter, and Cabrera added to it by scoring a run on a Damon single.[87] Brett Gardner replaced Cabrera in center field as a defensive substitution in the bottom of the sixth inning after Cabrera left the game due to a hamstring injury.[91] Chan Ho Park relieved Phillies starter Joe Blanton in the seventh and held the Yankees scoreless in that inning.[87] Chase Utley hit his third solo home run of the series in the bottom of the seventh with two outs, bringing the game to 4-3. Daisuke Matsuzaka relieved Sabathia and got the final out of the seventh without further scoring.[87]

Ryan Madson relieved Park in the eighth and allowed a walk and a single but held the Yankees scoreless.[87] Joba Chamberlain replaced Marte in the bottom of the inning. He struck out the first two batters he faced but allowed a game-tying home run to Feliz before closing the inning.[87] Brad Lidge came into the game in the ninth and gave up a two-out single to Damon - after a nine-pitch at bat.[87] Then, with Teixeira batting, Damon stole second and, on the same play, advanced to third as the base was uncovered due to a defensive shift against Teixeira.[92] Several news outlets referred to this as a "mad dash", [93][94] which Mike Vaccaro of the New York Post compared to Enos Slaughter's "Mad Dash" in the 1946 World Series.[95] Some believed that Damon's play caused Lidge to avoid throwing his best pitch - a slider with sharp downward movement - for the rest of the inning, as it risked a wild pitch that would have allowed Damon to score from third base.[96][97] Teixeira was then hit by a pitch and Rodriguez put the Yankees ahead with a double, scoring Damon.[87] Posada added to that lead with a single that scored Teixeira and Rodriguez.[87] Mariano Rivera entered in the bottom of the ninth and saved the game for the Yankees on eight pitches for his second save of the series.[87]

[edit] Game 5

Line score for Monday, November 2, 2009, 7:57 p.m. (ET) at Citizens Bank Park in Philadelphia, Pennsylvania

The Yankees replaced Melky Cabrera on their postseason roster with Ramiro Pe a due to his injury in Game 4, while Brett Gardner took Cabrera's place in center field.[98] A. J. Burnett, the Yankees' Game 2 starter, started Game 5 on three days rest, one less than the Phillies' Cliff Lee.[99] The Yankees scored first in the first inning, with Johnny Damon reaching base with a single and then scoring on a two-out double by Alex Rodriguez.[100] The Phillies responded in the bottom of the inning with a single by Jimmy Rollins, Shane Victorino reaching after being hit by a pitch, and finally a three-run home run by Chase Utley to take the lead.[100] The Phillies added to their lead in the third inning with Utley and Ryan Howard drawing walks followed by RBI singles by Jayson Werth and Ryan Howard.[100] With no outs in the inning, Burnett was relieved by David Robertson, who allowed another run to score on a Carlos Ruiz ground out.[100]

Robertson held the Phillies scoreless for a second inning in the fourth.[100] Jorge Posada entered as a pinch hitter in the fifth inning for Jos  Molina and grounded out.[100] Eric Hinske then pinch hit for Robertson and walked, advanced to third on a Derek Jeter single, and scored on a ground out by Damon.[100] Alfredo Aceves entered as the new Yankee pitcher in the bottom of the fifth.[100] The first batter he faced, Jayson Werth, hit a deep drive to center field but it was caught for an out by Gardner, who collided into the outfield wall to complete the play.[100] Aceves completed the inning without a run scoring, inducing ground outs from Ryan Howard and Ruiz.[100] Phil Coke relieved Aceves in the seventh inning and allowed two Phillies players tie World Series records.[100] First, Utley tied Reggie Jackson's record for most home runs in a World Series with a solo home run, his fifth of the series.[101] Coke then struck out Howard, Howard's 12th strikeout in the series, tying Willie Wilson's record for most strikeouts in a World Series.[102] Finally, Coke was driven from the game after allowing another solo home run, this time to Ryan Howard, and was relieved by Phil Hughes.[100]

Victorino was replaced defensively in the eighth inning by Ben Francisco.[100] Lee was driven from the game after allowing a single to Damon, followed by a double by Mark Teixeira, and then a double by Rodriguez that scored both runners.[100] Chan Ho Park relieved Lee and induced a ground out from Nick Swisher, which advanced Rodriguez to third base. Rodriguez scored on a sacrifice fly by Robinson Canó.³[100] Ryan Madson entered in the ninth to close the game, allowing a double to Posada and a single to Hideki Matsui without recording an out.[100] Batting with men on first and third base, Jeter grounded into a double play, allowing Posada to score but emptying the bases.[100] Damon singled to bring Teixeira to bat as the potential tying run, but Madson struck him out to record his first World Series save.[100] Members of the news media, such as Gene Wojciechowski, were critical of the three-man starting rotation strategy following Game 3,[44] and contended that Burnett's poor performance was caused by insufficient rest in between starts.[103] However, Burnett had been successful up to this point in such situations, going 4⁰ with a 2.33 ERA in four career starts on short rest (less than the normal four days between starts) before this game.[104]

[edit] Game 6

Line score for Wednesday, November 4, 2009, 7:57^Â p.m. (ET) at Yankee Stadium in The Bronx, New York

This game was the first Game 6 in a World Series since the 2003 World Series six years earlier, the longest such period in the history of the World Series.[105] Prior to the game, Mary J. Blige, a Bronx native, performed "The Star-Spangled Banner".[106] Andy Pettitte started on three days rest, the third straight game in which the Yankees fielded a pitcher on short rest.[107] The Yankees scored first with an Alex Rodriguez walk opening the bottom of the second inning followed by a two-run home run by designated hitter Hideki Matsui.[108] The Phillies quickly responded with a triple by Carlos Ruiz who then scored on a sacrifice fly from Jimmy Rollins in the top of the third.[108] Matsui answered back, adding to the Yankees lead again with a single with the bases loaded in the bottom of the third, scoring Derek Jeter and Johnny Damon.[108] Damon, injured running the bases while scoring, was replaced defensively in the top of the fourth by Jerry Hairston, Jr.[108]

Phillies starter Pedro Martínez was removed after just four innings, relieved in the fifth by Chad Durbin.[108] Durbin allowed a ground rule double to Jeter, who advanced to third on a sacrifice bunt by Hairston and scored on a single by Mark Teixeira.[108] Durbin then hit Rodriguez with a pitch and was relieved by J. A. Happ after recording just one out.[108] Happ allowed a two-run double to Matsui, his fifth and sixth RBI of the game, which tied a World Series record for most RBI in a single game set by Bobby Richardson in the 1960 World Series.[109]

The Phillies made the game closer in the top of the sixth inning, as Chase Utley drew a walk and Ryan Howard followed him with a two-run home run, bringing the score to 7^Â 3.[108] After Raúl Ibáñez hit a double into right field, Joba Chamberlain relieved Andy Pettitte and closed the sixth without scoring.[108] Chan Ho Park came in for Happ, ending any Yankees threat that inning.[108] Chamberlain was relieved by Dámaso Martínez in the top of the seventh after allowing two baserunners, but Martínez struck out Utley to end the inning scoreless.[108] After Park allowed a single to Rodriguez, Scott Eyre replaced him. Eyre allowed Rodriguez to steal second and intentionally walked Jorge Posada but escaped the inning without allowing a run.[108]

Martínez recorded one out, a strikeout of Howard, in the top of the eighth inning.[108] With it Howard set a new World Series record for most strikeouts by a hitter in a single series with a total of 13.[110] After the out, Martínez was relieved by the Yankees closer Mariano Rivera in a non-save situation.[108] Rivera allowed a double to Ibáñez, but no runs, in the eighth.[108] After retiring the first two batters in the eighth, Eyre gave way to Ryan Madson, who allowed a single to Jeter before ending the bottom of the eighth inning.[108] Matt Stairs led off the ninth as a pinch hitter, but lined out. Ruiz worked a walk from Rivera, but successive outs by Rollins and Victorino ended the game

7â ^3 to clinch the World Series for the Yankees.[108] Pettitte added to his own record for most playoff wins, bringing his career total to 18.[111]

[edit] Statistics

AL New York Yankees (4) vs. NL Philadelphia Phillies (2)

Game

Date

Score

Location

Time

Attendance

1

October 28

Philadelphia Phillies @ ^ 6, New York Yankees @ ^ 1

Yankee Stadium

3:27

50,207[112]

2

October 29

Philadelphia Phillies @ ^ 1, New York Yankees @ ^ 3

Yankee Stadium

3:25

50,181[113]Â

3

October 31

New York Yankees @ ^ 8, Philadelphia Phillies @ ^ 5

Citizens Bank Park

3:25

46,061[114]Â

4

November 1

New York Yankees @ ^ 7, Philadelphia Phillies @ ^ 4

Citizens Bank Park

3:25

46,145[115]Â

5

November 2

New York Yankees @ ^ 6, Philadelphia Phillies @ ^ 8

Citizens Bank Park

3:26

46,178[116]Â

6

November 4

Philadelphia Phillies @ ^ 3, New York Yankees @ ^ 7

Yankee Stadium

3:52

50,315[117]

[edit] Cumulative line score

Team

1

2

3

4

5

6

7

8

9

R

H

E

Philadelphia Phillies

4
4
5
1
0
4
3
3
3
27
44
2

New York Yankees

3
2
2
2
3
9
2
2
4
5
32
49
2

Total attendance: 289,087 Average attendance: 48,181
Winning player's share: \$350,029.99[118][119] Losing player's share: \$265,357.50[120]

[edit] Broadcasting

For the tenth consecutive year in the United States, Fox Sports televised the Series. Joe Buck called play-by-play and Tim McCarver provided analysis. The Series was also broadcast on ESPN Radio, with Jon Miller and Joe Morgan calling the action. Game 1 was watched by 19.5 million viewers, second only to the opening of the 2004 World Series in viewership for a series opener since 2000.[121] The viewership for the opening game resulted in a ratings percentage of 11.9% of households in the United States.[122] Game 4 produced the highest ratings of the series with 22.8 million viewers, the highest for any World Series game since 2004 and the highest for a "non-decisive Game 4" since 2003.[123] Fox Sports en Espaol also broadcast the Series for the US Spanish-speaking audience.[124] The flagship radio stations of the respective teams broadcast all Series games with their local announcers. In Philadelphia, WPHT carried the Phillies' English-language broadcasts, with Scott Franzke, Larry Andersen, Tom McCarthy, Gary Matthews, and Chris Wheeler announcing, while WUBA aired the team's Spanish broadcasts.[125] In New York, WCBS-AM carried the Yankees' English broadcasts with John Sterling and Suzyn Waldman announcing.[126] This broadcast made Waldman the first woman to announce a World Series game on radio.[127] XM Satellite Radio offered multiple feeds of each game to its subscribers.[128]

[edit] Impact and aftermath

Many players with both teams won awards for their performances during the 2009 season. Teixeira and Jeter each won a Gold Glove and Silver Slugger Award; Jimmy Rollins and Shane Victorino won Gold Gloves, as well; and Chase Utley won a Silver Slugger Award.[133] Rivera was named the 2009 DHL Delivery Man of the Year,[134] as well as Sporting News' Pro Athlete of the Year.[135] Along with the Hank Aaron Award announced before Game 4, Jeter won the Roberto Clemente Award and was named Sports Illustrated's Sportsman of the Year for 2009.[136][137] Matsui won the World Series MVP for his play, becoming the first Japanese player and first full-time designated hitter to win the award.[109][138] Several items related to the series were sent to the National Baseball Hall of Fame and Museum including bats from Jeter and Matsui; caps

from Rivera, Lee, and Pettitte; and Johnny Damon's cleats.[139]

[edit] Yankees

The series win brought the Yankees' franchise championship total to 27,[111][140] more than any other North American professional sports franchise. This championship came in the Yankees' first year in their new stadium. They had also won the 1923 World Series, the opening year of the previous Yankee Stadium.[141] The victory was noted by some sportswriters as a personal success for Alex Rodriguez, winning his first championship and succeeding in the playoffs where some had previously claimed he was a "choker and a loser".[142][143][144] Prior to this series, Rodriguez had appeared in 2,166 regular season games without a World Series appearance, then the second-most among active players to Ken Griffey, Jr.[142][144]

On November 6, a victory parade took place for the Yankees in the "Canyon of Heroes" in Manhattan, New York City.[145] The Yankees sent a group of players, coach Tony Peña, and team Senior Vice President Felix Lopez with the Commissioner's Trophy to the Dominican Republic in early January 2010 to meet with President Leonel Fernández.[146][147] Most of the 2009 Yankees received their championship rings on Opening Day the next season.[148] Matsui was on the Angels in 2010 and when the Angels played their first series of the season in the Bronx, the Yankees home opener, they presented him with his ring.[149] They also visited U.S. President Barack Obama in the White House in April 2010, presenting him with a signed jersey.[150]

The Yankees' victory was credited to a number of different sources.[151] Many players drew praise for their performances, including Series MVP Hideki Matsui;[109] free agents signed the previous offseason including Mark Teixeira, CC Sabathia, and A. J. Burnett;[152] and the so-called "Core Four" of Derek Jeter, Mariano Rivera, Andy Pettitte, and Jorge Posada, who had all played a large role in the Yankees' past success in the 1990s.[153][154][155] Manager Joe Girardi was also credited for his management of the team,[156] particularly in his decision to use only three starting pitchers in the Yankees postseason starting rotation.[157] The Yankees were the first team to use only three starters in a World Series since the San Diego Padres in the 1998 Series.[46] Several members of the Yankees franchise dedicated the World Series in part to team owner George Steinbrenner, who had recently stepped back from his once prominent position with the team.[158] Steinbrenner died on the day of the All-Star Game the following season at the age of 80.[159] The Yankees returned to the playoffs the following season and ultimately lost to the Texas Rangers in the 2010 ALCS.[160]

[edit] Phillies

Following Game 4, after the Yankees took a 3-1 series lead, The Philadelphia Inquirer accidentally printed a three-quarters-page Macy's advertisement congratulating the Phillies for winning the World Series, along with a picture of a Phillies championship T-shirt. The newspaper subsequently apologized for the mistake.[161] Lee Jenkins of Sports Illustrated attributed Philadelphia's loss to a lack of pitching depth, noting that three different Yankees starters managed to win games in the series, while only Cliff Lee won games for the Phillies.[162] Jorge Arangure Jr. of ESPN partially attributed the Phillies' loss to their lack of offensive production, citing the team's .227 batting average in the World Series.[163] The Phillies also returned to the playoffs in 2010 and lost to the eventual champions the San Francisco Giants in the NLCS.[164] The Phillies again returned to the playoffs in 2011 losing out to the eventual champions again (St. Louis Cardinals) in the first round NL divisional series.

[edit] David Paterson ticket scandal

Among those in attendance during Game 1 was New York Governor David Paterson, whose party had five tickets behind home plate. On March 3, 2010, the New York Commission on Public Integrity found that Paterson had violated state laws concerning gifts to public officials, and that he lied under oath to the commission about his intent to pay for the tickets.[165] The commission further found that Paterson used his position to solicit and receive the five

ticketsâ ~valued at US\$425 eachâ ~free of charge from the Yankees,[166] that he had never intended to pay for the tickets despite testimony to the contrary, and that he or a person acting on his behalf wrote a backdated check to pay for them only after scrutiny in the case arose.[165][166] The Commission ultimately fined Paterson \$62,125 for his actions.[167]

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[edit] External links

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Links to related articles

Pearl Jam

Pearl Jam performing in Hamilton, Ontario, Canada, in 2011.

Background information

Also known as

Mookie Blaylock

Origin

Seattle, Washington, United States

Genres

Alternative rock, grunge, hard rock

Years active

1990 (1990)–present

Labels

Monkeywrench, Universal Music Group, J, Epic

Associated acts

Green River, Soundgarden, Mother Love Bone, Temple of the Dog, Skin Yard, Brad, Hovercraft, Three Fish, Wellwater Conspiracy, Mad Season, Neil Young, RNDM

Website

www.pearljam.com,

Members

Jeff AmentMatt CameronStone GossardMike McCreadyEddie Vedder

Past members

Dave AbbruzzeseMatt ChamberlainJack IronsDave Krusen

Pearl Jam is an American rock band that formed in Seattle, Washington, in 1990. Since its inception, the band's line-up has included Eddie Vedder (vocals), Stone Gossard (guitar), Jeff Ament (bass), and Mike McCready (guitar). The band's current drummer is Matt Cameron, also of Soundgarden, who has been with the band since 1998.

Formed after the demise of Gossard and Ament's previous band, Mother Love Bone, Pearl Jam broke into the mainstream with its debut album, *Ten*. One of the key bands of the grunge movement in the early 1990s, Pearl Jam was criticized early on as being a corporate cash-in on the alternative rock explosion. However, over the course of the band's career, its members became noted for their refusal to adhere to traditional music industry practices, including refusing to make music videos and engaging in a much-publicized boycott of Ticketmaster. In 2006, *Rolling Stone* described the band as having "spent much of the past decade deliberately tearing apart their own fame."^[1]

To date, the band has sold over 31.5 million records in the U.S.,^[2] and an estimated 60 million worldwide.^{[3][4]} Pearl Jam has outlasted many of its contemporaries from the alternative rock breakthrough of the early 1990s, and is considered one of the most influential bands of the decade.^[5] Stephen Thomas Erlewine of *Allmusic* referred to Pearl Jam as "the most popular American rock & roll band of the '90s."^[6]

[edit] History

[edit] Formation: 1984–1990

Stone Gossard and Jeff Ament were members of pioneering grunge band Green

River during the mid-1980s. Green River toured and recorded to moderate success but disbanded in 1987 due to a stylistic division between the pair and bandmates Mark Arm and Steve Turner.[7] In late 1987, Gossard and Ament began playing with Malfunkshun vocalist Andrew Wood, eventually organizing the band Mother Love Bone. In 1988 and 1989, the band recorded and toured to increasing interest and found the support of the PolyGram record label, which signed the band in early 1989. Mother Love Bone's debut album, *Apple*, was released in July 1990, four months after Wood died of a heroin overdose.[8]

Ament and Gossard were devastated by the death of Wood and the resulting demise of Mother Love Bone. Gossard spent his time afterwards writing material that was harder-edged than what he had been doing previously.[9] After a few months, Gossard started practicing with fellow Seattle guitarist Mike McCready, whose band, Shadow, had broken up; McCready in turn encouraged Gossard to reconnect with Ament.[1] After practicing for a while, the trio sent out a five-song demo tape in order to find a singer and a drummer. They gave former Red Hot Chili Peppers drummer Jack Irons the demo to see if he would be interested in joining the band and to distribute the demo to anyone he felt might fit the lead vocal position.[9]

Irons passed on the invitation but gave the demo to his basketball buddy, San Diego, California singer Eddie Vedder.[10] Vedder was the lead vocalist for a San Diego band, Bad Radio, and worked part-time at a gas station. He listened to the tape shortly before going surfing, where lyrics came to him.[9] He then recorded the vocals to three of the songs ("Alive", "Once", and "Footsteps") in what he later described as a "mini-opera" entitled *Momma-Son*. [11] Vedder sent the tape with his vocals back to the three Seattle musicians, who were impressed enough to fly Vedder up to Seattle for an audition. Within a week, Vedder had joined the band.[9]

With the addition of Dave Krusen on drums, the band took the name Mookie Blaylock, in reference to the then-active All-Star basketball player. The band played its first official show at the Off Ramp Caf   in Seattle on October 22, 1990,[12] and soon signed to Epic Records. However, concerns about trademark issues necessitated a name change; the band's name became "Pearl Jam".[6] In an early promotional interview, Vedder said that the name "Pearl Jam" was a reference to his great-grandmother Pearl, who was married to a Native American and had a special recipe for peyote-laced jam.[13] In a 2006 Rolling Stone cover story however, Vedder admitted that this story was "total bullshit", even though he indeed had a great-grandma named Pearl. Ament and McCready explained that Ament came up with "pearl", and that the band later settled on "Pearl Jam" after attending a concert by Neil Young, in which he extended his songs as improvisations of 15  20 minutes in length.[1]

[edit] Ten and the grunge explosion: 1991  1992

Pearl Jam entered Seattle's London Bridge Studios in March 1991 to record its debut album, *Ten*[14] McCready said that "Ten was mostly Stone and Jeff; me and Eddie were along for the ride at that time." [15] Krusen left the band in May 1991 after checking himself into rehabilitation; [16] he was replaced by Matt Chamberlain, who had previously played with Edie Brickell & New Bohemians. After playing only a handful of shows, one of which was filmed for the "Alive" video, Chamberlain left to join the Saturday Night Live band.[17] Chamberlain suggested Dave Abbruzzese as his replacement. Abbruzzese joined the group and played the rest of Pearl Jam's live shows supporting Ten.

Released on August 27, 1991, *Ten* (named after Mookie Blaylock's jersey number)[13] contained eleven tracks dealing with dark subjects like depression, suicide, loneliness, and murder. Ten's musical style, influenced by classic rock, combined an "expansive harmonic vocabulary" with an anthemic sound.[18] The album was slow to sell, but by the second half of 1992 it became a breakthrough success, being certified gold and reaching number two on the Billboard charts.[14] Ten produced the hit singles "Alive", "Even Flow", and "Jeremy". Originally interpreted as an anthem by many,[9] Vedder later revealed that "Alive" tells the semi-biographical tale of a son discovering that his father is actually his stepfather, while his mother's grief turns her to

sexually embrace her son, who strongly resembles the biological father.[9] The song "Jeremy" (Â sampleÂ (helpÂ·info)) and its accompanying video were inspired by a true story in which a high school student shot himself in front of his classmates.[19] Ten stayed on the Billboard charts for more than two years, and has gone on to become one of the highest-selling rock records ever, going 13x platinum.[20]

With the success of Ten, Pearl Jam became a key member of the Seattle grunge explosion, along with Alice in Chains, Nirvana, and Soundgarden. The band was criticized in the music press; British music magazine NME said that Pearl Jam was "trying to steal money from young alternative kids' pockets." [21] Nirvana's Kurt Cobain angrily attacked Pearl Jam, claiming the band were commercial sellouts,[22] and argued Ten was not a true alternative album because it had so many prominent guitar leads.[14] Cobain later reconciled with Vedder, and they reportedly were on amicable terms before Cobain's death in 1994.[1]

Pearl Jam toured relentlessly in support of Ten. Ament stated that "essentially Ten was just an excuse to tour," adding, "We told the record company, 'We know we can be a great band, so let's just get the opportunity to get out and play.'" [23] The band's manager, Kelly Curtis, stated, "Once people came and saw them live, this lightbulb would go on. Doing their first tour, you kind of knew it was happening and there was no stopping it." [15] Early on in Pearl Jam's career, the band became known for its intense live performances. Looking back at this time, Vedder said that "playing music and then getting a shot at making a record and at having an audience and stuff, it's just like an untamed force...But it didn't come from jock mentality. It came from just being let out of the gates." [24] In 1992, Pearl Jam made television appearances on Saturday Night Live and MTV Unplugged and took a slot on that summer's Lollapalooza tour with the Red Hot Chili Peppers, Soundgarden, and Ministry, among others. The band contributed two songs to the soundtrack of the 1992 Cameron Crowe film Singles: "State of Love and Trust" and "Breath". Ament, Gossard and Vedder appeared in Singles under the name "Citizen Dick"; their parts were filmed when Pearl Jam was known as Mookie Blaylock.

[edit] Dealing with success: 1993â ^1995

The band members grew uncomfortable with their success, with much of the burden of Pearl Jam's popularity falling on frontman Vedder.[9] While Pearl Jam received four awards at the 1993 MTV Video Music Awards for its video for "Jeremy", including Video of the Year and Best Group Video, the band refused to make a video for "Black" in spite of pressure by the label. This action began a trend of the band refusing to make videos for its songs, despite it being common knowledge that music videos were one of the most vital sales tools any band had in its arsenal. However, Vedder felt that the concept of music videos robbed the listener from creating their own interpretation of the song stating that "Before music videos first came out, youâ d listen to a song with headphones on, sitting in a beanbag chair with your eyes closed, and youâ d come up with your own visions, these things that came from within. Then all of a sudden, sometimes even the very first time you heard a song, it was with these visual images attached, and it robbed you of any form of self-expression." [25] "Ten years from now," Ament said, "I don't want people to remember our songs as videos." [9]

Pearl Jam headed into the studio in early 1993 facing the challenge of following up the commercial success of its debut. McCready said, "The band was blown up pretty big and everything was pretty crazy." [26] Released on October 19, 1993, Pearl Jam's second album, Vs., sold 950,378 copies in its first week of release and outperformed all other entries in the Billboard top ten that week combined.[27] The album set the record for most copies of an album sold in its first week of release, which it held until broken by Garth Brooks' 1998 album, Double Live.[28] Vs. included the singles "Go", "Daughter", "Animal", and "Dissident". Paul Evans of Rolling Stone said, "Few American bands have arrived more clearly talented than this one did with Ten; and Vs. tops even that debut." He added, "Like Jim Morrison and Pete Townshend, Vedder makes a forte of his psychological-mythic explorations... As guitarists Stone Gossard and

Mike McCready paint dense and slashing backdrops, he invites us into a drama of experiment and strife." [29] The band decided, beginning with the release of Vs., to scale back its commercial efforts. [30] The members declined to produce any more music videos after the massive success of "Jeremy" and opted for fewer interviews and television appearances. Industry insiders compared Pearl Jam's tour that year to the touring habits of Led Zeppelin, in that the band "ignored the press and took its music directly to the fans." [31] During the Vs. Tour, the band set a cap on ticket prices in an attempt to thwart scalpers. [32]

By 1994, Pearl Jam was "fighting on all fronts", as its manager described the band at the time. [33] Pearl Jam was outraged when, after it played a pair of shows in Chicago, Illinois, it discovered that ticket vendor Ticketmaster had added a service charge to the tickets. Pearl Jam was committed to keeping their concert ticket prices down but Fred Rosen of Ticketmaster, refused to waive the service charge. Since Ticketmaster controlled most major venues, the band was forced to create from scratch its own outdoor stadiums in rural areas in order to perform. Pearl Jam's efforts to organize a tour without the ticket giant collapsed which Pearl Jam said was evidence of Ticketmaster's monopoly. An analysis of journalist Chuck Philips investigative series [34][35][36][37][38][39] in a well known legal monograph [40] concluded that it was hard to imagine a legitimate reason for Ticketmaster's exclusive contracts with venues and contracts which covered such a lengthy period of time. The authors said, "The pervasiveness of Ticketmaster's exclusive agreements, coupled with their excessive duration and the manner in which they are procured, supported a finding that Ticketmaster had engaged in anticompetitive conduct under section 2 of the Sherman Act." The United States Department of Justice was investigating the company's practices at the time and asked the band to create a memorandum of its experiences with the company. Band members Gossard and Ament testified at a subcommittee investigation on June 30, 1994 in Washington, D.C. [41] Pearl Jam alleged that Ticketmaster used anti-competitive and monopolistic practices to gouge fans. After Pearl Jam's testimony before Congress, Congressman Dingell (D-Mich.) wrote a bill requiring full disclosure to prevent Ticketmaster from burying escalating service fees. Pearl Jam's manager said he was gratified that that Congress recognized the problem as a national issue. [42] The band eventually canceled its 1994 summer tour in protest. [43] After the Justice Department dropped the case, Pearl Jam continued to boycott Ticketmaster, refusing to play venues that had contracts with the company. [44] Music critic Jim DeRogatis noted that along with the Ticketmaster debacle, "the band has refused to release singles or make videos; it has demanded that its albums be released on vinyl; and it wants to be more like its '60s heroes, The Who, releasing two or three albums a year." He also stated that sources said that most of the band's third album Vitalogy was completed by early 1994, but that either a forced delay by Epic or the battle with Ticketmaster were to blame for the delay. [33]

Pearl Jam wrote and recorded while touring behind Vs. and the majority of the tracks for its next album, Vitalogy, were recorded during breaks on the tour. Tensions within the band had dramatically increased by this time. Producer Brendan O'Brien said, "Vitalogy was a little strained. I'm being polite" there was some imploding going on." [15] After Pearl Jam finished the recording of Vitalogy, drummer Dave Abbruzzese was fired. The band cited political differences between Abbruzzese and the other members; for example, Abbruzzese disagreed with the Ticketmaster boycott. [15] He was replaced by Jack Irons, a close friend of Vedder and the former and original drummer of the Red Hot Chili Peppers. Irons made his debut with the band at Neil Young's 1994 Bridge School Benefit, but he was not officially announced as the band's new drummer until its 1995 Self-Pollution satellite radio broadcast, a four-and-a-half-hour long pirate broadcast out of Seattle which was available to any radio stations that wanted to carry it. [45]

Vitalogy was released first on November 22, 1994 on vinyl and then two weeks later on December 6, 1994 on CD and cassette. The CD became the second-fastest-selling in history, with more than 877,000 units sold in its

first week.[12] Stephen Thomas Erlewine of Allmusic said that "thanks to its stripped-down, lean production, Vitalogy stands as Pearl Jam's most original and uncompromising album." [46] Many of the songs on the album appear to be based around the pressures of fame.[47] The song "Spin the Black Circle", an homage to vinyl records, won a Grammy Award in 1996 for Best Hard Rock Performance. Vitalogy also included the songs "Not for You", "Corduroy", "Better Man", and "Immortality". "Better Man" (sample (info)), a song originally written and performed by Vedder while in Bad Radio, reached number one on the Billboard Mainstream Rock chart, spending a total of eight weeks there. Considered a "blatantly great pop song" by producer Brendan O'Brien, Pearl Jam was reluctant to record it and had initially rejected it from Vs. due to its accessibility.[15]

The band continued its boycott against Ticketmaster during its 1995 tour for Vitalogy, but was surprised that virtually no other bands joined in.[48] Pearl Jam's initiative to play only at non-Ticketmaster venues effectively, with a few exceptions, prevented it from playing shows in the United States for the next three years.[49] Ament later said, "We were so hardheaded about the 1995 tour. Had to prove we could tour on our own, and it pretty much killed us, killed our career." [15] In the same year Pearl Jam backed Neil Young, whom the band had noted as an influence, on his album Mirror Ball. Contractual obligations prevented the use of the band's name anywhere on the album, but the members were all credited individually in the album's liner notes.[6] Two songs from the sessions were left off Mirror Ball: "I Got Id" and "Long Road". These two tracks were released separately by Pearl Jam in the form of the 1995 EP, Merkin Ball.

[edit] No Code and Yield: 1996â ^1999

Following the round of touring for Vitalogy, the band went into the studio to record its follow-up, No Code. Vedder said, "Making No Code was all about gaining perspective." [50] Released in 1996, No Code was seen as a deliberate break from the band's sound since Ten,[51] favoring experimental ballads and noisy garage rockers. David Browne of Entertainment Weekly stated that "No Code displays a wider range of moods and instrumentation than on any previous Pearl Jam album." [52] The lyrical themes on the album deal with issues of self-examination,[53] with Ament stating, "In some ways, it's like the band's story. It's about growing up." [53] Although the album debuted at number one on the Billboard charts, it quickly fell down the charts. No Code included the singles "Who You Are" (Â sampleÂ (helpÂ·info)), "Hail, Hail", and "Off He Goes". As with Vitalogy, very little touring was done to promote No Code because of the band's refusal to play in Ticketmaster's venue areas. A European tour took place in the fall of 1996. Gossard stated that there was "a lot of stress associated with trying to tour at that time" and that "it was growing more and more difficult to be excited about being part of the band." [15]

Following the short tour for No Code, the band went into the studio in 1997 to record its follow-up. The sessions for the band's fifth album represented more of a team effort between all members of the group, with Ament stating that "everybody really got a little bit of their say on the record...because of that, everybody feels like they're an integral part of the band." [54] On February 3, 1998, Pearl Jam released its fifth album, Yield. The album was cited as a return to the band's early, straightforward rock sound.[55] Tom Sinclair of Entertainment Weekly stated that the band has "turned in an intermittently affecting album that veers between fiery garage rock and rootsy, acoustic-based ruminations. Perhaps mindful of their position as the last alt-rock ambassadors with any degree of clout, they've come up with their most cohesive album since their 1991 debut, Ten." [56] Lyrically, Yield continued with the more contemplative type of writing found on No Code,[57] with Vedder saying, "What was rage in the past has become reflection." [58] Yield debuted at number two on the Billboard charts, but like No Code soon began dropping down the charts.[59] It included the singles "Given to Fly" and "Wishlist". The band hired comic book artist Todd McFarlane to create an animated video for the song "Do the Evolution" from the album, its first music video since 1992.[60] A

documentary detailing the making of *Yield*, *Single Video Theory*, was released on VHS and DVD later that year.

In April 1998, Pearl Jam once again changed drummers. Jack Irons left the band due to dissatisfaction with touring and was replaced with former Soundgarden drummer Matt Cameron on an initially temporary basis,[61] but he soon became a permanent replacement for Irons. Pearl Jam's 1998 *Yield* Tour in North America marked the band's return to full-scale touring. The band's anti-trust lawsuit against Ticketmaster had proven to be unsuccessful and hindered live tours. Many fans had complained about the difficulty in obtaining tickets and the use of non-Ticketmaster venues, which were judged to be out-of-the-way and impersonal. For this tour and future tours, Pearl Jam once again began using Ticketmaster in order to "better accommodate concertgoers." [62] The 1998 summer tour was a big success,[63] and after it was completed the band released *Live on Two Legs*, a live album which featured select performances from the tour.

In 1998, Pearl Jam recorded "Last Kiss", a cover of a 1960s ballad made famous by J. Frank Wilson and the Cavaliers. It was recorded during a soundcheck and released on the band's 1998 fan club Christmas single. The following year, the cover was put into heavy rotation across the country. By popular demand, the cover was released to the public as a single in 1999, with all of the proceeds going to the aid of refugees of the Kosovo War.[12] The band also decided to include the song on the 1999 charity compilation album, *No Boundaries: A Benefit for the Kosovar Refugees*. "Last Kiss" peaked at number two on the *Billboard* charts and became the band's highest-charting single.

[edit] Binaural and the Roskilde tragedy: 2000â ^2001

Following its full-scale tour in support of *Yield*, the band took a short break, but then reconvened toward the end of 1999 and commenced work on a new album. On May 16, 2000, Pearl Jam released its sixth studio album, *Binaural*. It was drummer Matt Cameron's studio recording debut with the band. The title is a reference to the binaural recording techniques that were utilized on several tracks by producer Tchad Blake, known for his use of the technique.[64] *Binaural* was the first album since the band's debut not produced by Brendan O'Brien, although O'Brien was called in later to remix several tracks. Gossard stated that the band members "were ready for a change." [26] Jon Pareles of *Rolling Stone* said, "Apparently as tired of grunge as everyone except Creed fans, Pearl Jam delve elsewhere." He added, "The album reflects both Pearl Jam's longstanding curse of self-importance and a renewed willingness to be experimental or just plain odd." [65] The album is lyrically darker than the band's previous album *Yield*, with Gossard describing the lyrics as "pretty sombre." [57] *Binaural* included the singles "Nothing as It Seems" (Â sampleÂ (helpÂ·info)), one of the songs featuring binaural recording, and "Light Years". The album sold just over 700,000 copies and became the first Pearl Jam studio album to fail to reach platinum status.[66]

Pearl Jam decided to record every show on its 2000 *Binaural* Tour professionally, after noting the desire of fans to own a copy of the shows they attended and the popularity of bootleg recordings. The band had been open in the past about allowing fans to make amateur recordings,[67] and these "official bootlegs" were an attempt to provide a more affordable and better quality product for fans.[68] Pearl Jam originally intended to release them to only fan club members, but the band's record contract prevented it from doing so. Pearl Jam released all of the albums in record stores as well as through its fan club. The band released 72 live albums in 2000 and 2001, and set a record for most albums to debut in the *Billboard* 200 at the same time.[69]

Pearl Jam's 2000 European tour ended in tragedy on June 30, with an accident at the Roskilde Festival in Denmark. Nine fans were crushed underfoot and suffocated to death as the crowd rushed to the front. After numerous requests for the crowd to step back, the band stopped playing and tried to calm the crowd when the musicians realized what was happening, but it was already too late. The two remaining dates of the tour were canceled and members of the band contemplated retiring after this event.[70] Pearl Jam was initially blamed for the accident, but was later cleared of responsibility.[71]

A month after the European tour concluded, the band embarked on its two-leg 2000 North American tour. On performing after the Roskilde tragedy, Vedder said that "playing, facing crowds, being togetherâ ~it enabled us to start processing it." [15] On October 22, 2000, the band played the MGM Grand in Las Vegas, celebrating the tenth anniversary of its first live performance as a band. Vedder took the opportunity to thank the many people who had helped the band come together and make it to ten years. He noted that "I would never do this accepting a Grammy or something." [72] After concluding the Binaural Tour, the band released *Touring Band 2000* the following year. The DVD featured select performances from the North American legs of the tour.

Following the events of the September 11, 2001 terrorist attacks, Vedder and McCready were joined by Neil Young to perform the song "Long Road" from the Merkin Ball EP at the America: A Tribute to Heroes benefit concert. The concert, which aired on September 21, 2001, raised money for the victims and their families.

[edit] Riot Act: 2002â ~2005

Pearl Jam commenced work on a new album following a year-long break after its full-scale tour in support of *Binaural*. McCready described the recording environment as "a pretty positive one" and "very intense and spiritual." [73] Regarding the time period when the lyrics were being written, Vedder said, "There's been a lot of mortality...It's a weird time to be writing. Roskilde changed the shape of us as people, and our filter for seeing the world changed." [74] Pearl Jam released its seventh album, *Riot Act*, on November 12, 2002. It included the singles "I Am Mine" and "Save You". The album featured a much more folk-based and experimental sound, evident in the presence of B3 organist Boom Gaspar on songs such as "Love Boat Captain". Stephen Thomas Erlewine of Allmusic said "*Riot Act* is the album that Pearl Jam has been wanting to make since *Vitalogy*â ~a muscular art rock record, one that still hits hard but that is filled with ragged edges and odd detours." [75] The track entitled "Arc" was recorded as a vocal tribute to the nine people who died at the Roskilde Festival in June 2000. Vedder only performed this song nine times on the 2003 tour, and the band left the track off all released bootlegs. [76]

In 2003, the band embarked on its *Riot Act Tour*, which included tours in Australia and North America. The band continued its official bootleg program, making every concert from the tour available in CD form through its official website. A total of six bootlegs were made available in record stores: Perth, Tokyo, State College, Pennsylvania, two shows from Madison Square Garden, and Mansfield, Massachusetts. At many shows during the 2003 North American tour, Vedder performed *Riot Act*'s "Bu\$hleaguer", a commentary on President George W. Bush, with a rubber mask of Bush, wearing it at the beginning of the song and then hanging it on a mic stand to allow him to sing. The band made news when it was reported that several fans left after Vedder had "impaled" the Bush mask on his mic stand at the band's Denver, Colorado show. [77]

In June 2003, Pearl Jam announced it was officially leaving Epic Records following the end of its contract with the label. The band stated it had "no interest" in signing with another label. [78] The band's first release without a label was the single for "Man of the Hour", in partnership with Amazon.com. [79] Director Tim Burton approached Pearl Jam to request an original song for the soundtrack of his new film, *Big Fish*. After screening an early print of the film, Pearl Jam recorded the song for him. "Man of the Hour", which was later nominated for a Golden Globe Award, can be heard in the closing credits of *Big Fish*.

The band released *Lost Dogs*, a two-disc collection of rarities and B-sides, and *Live at the Garden*, a DVD featuring the band's July 8, 2003 concert at Madison Square Garden through Epic Records in November 2003. In 2004, Pearl Jam released the live album, *Live at Benaroya Hall*, through a one-album deal with BMG. [80] 2004 marked the first time that Pearl Jam licensed a song for usage in a television show; a snippet of the song "Yellow Ledbetter" was used in the final episode of the television series *Friends*. [81] Later that year, Epic released *rearviewmirror* (*Greatest Hits 1991â ~2003*), a Pearl Jam greatest hits

collection spanning 1991 to 2003. This release marked the end of Pearl Jam's contractual agreement with Epic Records.[82]

Pearl Jam played a show at Easy Street Records in Seattle in April 2005; recordings from the show were compiled for the Live at Easy Street album and released exclusively to independent record stores in June 2006. The band embarked on a Canadian cross-country tour in September 2005, kicking off the tour with a fundraising concert in Missoula, Montana for Democratic politician Jon Tester, then playing the Gorge Amphitheater before crossing into Canada. After touring Canada, Pearl Jam proceeded to open a Rolling Stones concert in Pittsburgh, then played two shows at the Borgata casino in Atlantic City, New Jersey, before closing the tour with a concert in Philadelphia, Pennsylvania. The official bootlegs for the band's 2005 shows were distributed via Pearl Jam's official website in MP3 form. Pearl Jam also played a benefit concert to raise money for Hurricane Katrina relief on October 5, 2005, at the House of Blues in Chicago, Illinois. On November 22, 2005, Pearl Jam began its first Latin American tour.[83]

[edit] Move to J Records and Pearl Jam: 2006â ^2008

The work for Pearl Jam's follow-up to Riot Act began after its appearance on the 2004 Vote for Change tour. The time period between the two albums was the longest gap between Pearl Jam's studio albums to date and the new album was its first release for a new label. Clive Davis announced in February 2006 that Pearl Jam had signed with his label, J Records, which like Epic, is part of Sony Music Entertainment (then known as Sony BMG).[84] The band's eighth studio album, Pearl Jam, was released on May 2, 2006. A number of critics cited Pearl Jam as a return to the band's early sound,[85][86] and McCready compared the new material to Vs. in a 2005 interview.[87] Ament said, "The band playing in a roomâ ~that came across. Thereâ s a kind of immediacy to the record, and thatâ s what we were going for." [88] Chris Willman of Entertainment Weekly said that "in a world full of boys sent to do a man's job of rocking, Pearl Jam can still pull off gravitas." [89] Current socio-political issues in the United States are addressed on the album. "World Wide Suicide", a song criticizing the Iraq War and U.S. foreign policy, was released as a single and topped the Billboard Modern Rock chart; it was Pearl Jam's first number one on that chart since "Who You Are" in 1996, and first number one on any chart in the United States since 1998 when "Given to Fly" reached number one on the Mainstream Rock chart. Pearl Jam also included the singles "Life Wasted" and "Gone".

To support Pearl Jam, the band embarked on its 2006 world tour. It toured North America, Australia and notably Europe; Pearl Jam had not toured the continent for six years. The North American tour included three two-night stands opening for Tom Petty and the Heartbreakers.[90] The band served as the headliners for the Leeds and Reading festivals, despite having vowed to never play at a festival again after Roskilde. Vedder started both concerts with an emotional plea to the crowd to look after each other. He commented during the Leeds set that the band's decision to play a festival for the first time after Roskilde had nothing to do with "guts" but with trust in the audience.[91]

In 2007, Pearl Jam recorded a cover of The Who's "Love, Reign o'er Me" for the Mike Binder film, Reign Over Me; it was later made available as a music download on the iTunes Music Store.[92] The band embarked on a 13-date European tour, and headlined Lollapalooza in Grant Park, on August 5, 2007.[93] The band released a CD box set in June 2007, entitled Live at the Gorge 05/06, that documents its shows at The Gorge Amphitheatre,[94] and in September 2007 a concert DVD, entitled Immagine in Cornice, which documents the band's Italian shows from its 2006 tour was released.[95]

In June 2008, Pearl Jam performed as the headline act at the Bonnaroo Music Festival.[96] The Bonnaroo appearance took place amidst a twelve-date tour in the Eastern United States.[97] In July 2008, the band performed at the VH1 tribute to The Who alongside Foo Fighters, Incubus and The Flaming Lips.[98] In the days prior to Election Day 2008, Pearl Jam digitally released through its official website a free documentary film, entitled Vote for Change? 2004, which follows the band's time spent on the 2004 Vote for Change tour.[99]

[edit] Reissues and Backspacer: 2009â ^present

In March 2009, Ten was reissued in four editions, featuring such extras as a remastering and remix of the entire album by Brendan O'Brien, a DVD of the band's 1992 appearance on MTV Unplugged, and an LP of its September 20, 1992 concert at Magnuson Park in Seattle.[100] It was the first reissue in a planned re-release of Pearl Jam's entire catalog that led up to the band's 20th anniversary in 2011.[100] A Pearl Jam retrospective film directed by Cameron Crowe titled Pearl Jam Twenty[101] was also planned to coincide with the anniversary.[102] In 2011, Vs. and Vitalogy were reissued in the spring time in deluxe form.[101]

Pearl Jam began work for the follow-up to Pearl Jam in early 2008.[103] In 2009, the band began to build on instrumental and demo tracks written during 2008.[104] The band's ninth studio album, Backspacer, its first to be produced by Brendan O'Brien since Yield.[103] Backspacer debuted at No. 1 on the Billboard music charts, the band's first album to do so since No Code in 1996.[citation needed] The music on the record features a sound influenced by pop and New Wave.[105] Stephen Thomas Erlewine of Allmusic said that "prior to Backspacer, Pearl Jam wouldn't or couldn't have made music this unfettered, unapologetically assured, casual, and, yes, fun." [106] Regarding the lyrics, Vedder said, "I've tried, over the years, to be hopeful in the lyrics, and I think that's going to be easier now." [107] "The Fixer" was chosen as the album's first single.[108] Pearl Jam did not re-sign its record deal with J Records, and the band released the album through its own label Monkeywrench Records in the United States and through Universal Music Group internationally. Pearl Jam reached a deal with Target to be the exclusive big-box store retailer for the album in the United States. The album also saw release through the band's official website, independent record stores, online retailers, and iTunes.[109][110] In an interview McCready revealed that Pearl Jam may finish the Backspacer outtakes in the next six months,[111] and told San Diego radio station KBZT that the band may release an EP in 2010 consisting of those songs, while Vedder instead suggested that the songs may be used for the band's next studio album.[112]

In August 2009, Pearl Jam headlined the Virgin Festival,[113] the Outside Lands Music and Arts Festival,[114] and played five shows in Europe and three in North America.[115][116][117] In October 2009, Pearl Jam headlined the Austin City Limits Music Festival.[118] Later in October on Halloween night, the band played in what was the last performance at the Philadelphia Spectrum. An additional leg consisting of a tour of Oceania took place afterwards.[110] In May 2010, the band embarked on a month long tour starting with the New Orleans Jazz & Heritage Festival. The tour headed to the East Coast and ended May 21, 2010 at Madison Square Garden in New York.[119] A European tour took place in June and July 2010, where the band performed in Northern Ireland for the first time at the Odyssey Arena in Belfast.[120] In late October 2010, Pearl Jam performed at the 24th Annual Bridge School Benefit Concert at the Shoreline Amphitheater in Mountain View, California.[121] A live album, titled Live on Ten Legs, was released on January 17, 2011.[122] It is compilation of live tracks from their 2003 to 2010 world tours, and is a follow-up to Live on Two Legs, which consisted of songs recorded during their 1998 North American tour.[123]

In March 2011, bassist Jeff Ament told Billboard that the band has 25 songs and they'd be heading into the studio in April to begin recording the follow-up to Backspacer.[124] On May 16, 2011, the band confirmed that they would play the Labor Day weekend at the Alpine Valley Music Theatre, East Troy, Wisconsin, followed by ten shows in Canada.[125]

On September 8, 2011, the band released a new song titled "Oliã".[126] On November 18, the band released Toronto 9.11.11â ~a free live album available through the launch of Google Music.

On November 21, 2011, as part of their PJ20 World Tour, Pearl Jam visited Costa Rica for the first time to a 30,000 crowd of fans at the New National Stadium.[127] The following month, the band announced a tour of Europe, which

started in June 2012.[128]

[edit] Musical style and influences

Compared with the other grunge bands of the early 1990s, Pearl Jam's style is noticeably less heavy and harkens back to the classic rock music of the 1970s.[129] Pearl Jam has cited many punk rock and classic rock bands as influences, including The Who, Neil Young, and the Ramones.[130] Pearl Jam's success has been attributed to its sound, which fuses "the riff-heavy stadium rock of the '70s with the grit and anger of '80s post-punk, without ever neglecting hooks and choruses." [6] Gossard's rhythm guitar style is known for its sense of beat and groove,[131] while McCready's lead guitar style, influenced by artists such as Jimi Hendrix,[132] has been described as "feel-oriented" and "rootsy." [133]

Pearl Jam has broadened its musical range with subsequent releases. As he had more influence on the band's sound, Vedder sought to make the band's musical output less catchy. He said, "I felt that with more popularity, we were going to be crushed, our heads were going to pop like grapes." [1] By 1994's *Vitalogy*, the band began to incorporate more punk influences into its music.[134] The band's 1996 album, *No Code*, was a deliberate break from the musical style of *Ten*. The songs on the album featured elements of garage rock, worldbeat, and experimentalism.[6] After 1998's *Yield*, which was somewhat of a return to the straightforward rock approach of the band's early work,[55] the band dabbled with experimental art rock on 2000's *Binaural* and folk rock elements on 2002's *Riot Act*. The band's 2006 album, *Pearl Jam*, was cited as a return to the band's early sound.[85][86] The band's 2009 album, *Backspacer*, contains elements of pop and New Wave.[105]

Critic Jim DeRogatis describes Vedder's vocals as a "Jim Morrison-like vocal growl." [135] Greg Prato of *Allmusic* said, "With his hard-hitting and often confessional lyrical style and Jim Morrison-esque baritone, Vedder also became one of the most copied lead singers in all of rock." [136] Vedder's lyrical topics range from personal ("Alive", "Better Man") to social and political concerns ("Even Flow", "World Wide Suicide"). His lyrics have often invoked the use of storytelling and have included themes of freedom, individualism, and sympathy for troubled individuals.[137] When the band started, Gossard and McCready were clearly designated as rhythm and lead guitarists, respectively. The dynamic began to change when Vedder started to play more rhythm guitar during the *Vitalogy* era. McCready said in 2006, "Even though there are three guitars, I think there's maybe more room now. Stone will pull back and play a two-note line and Ed will do a power chord thing, and I fit into all that." [138]

[edit] Legacy

While Nirvana had brought grunge to the mainstream in the early 1990s, Pearl Jam quickly outsold them,[139] and became "the most popular American rock & roll band of the '90s" according to *Allmusic*. [6] Pearl Jam has been described as "modern rock radio's most influential stylists" ^ the workmanlike midtempo chug of songs like "Alive" and "Even Flow" just melodic enough to get moshers singing along." [140] The band inspired and influenced a number of bands, ranging from Silverchair to Puddle of Mudd and The Strokes.[141][142] Pearl Jam has outlasted many of its contemporaries in the grunge scene such as Nirvana, Alice in Chains, and Soundgarden.[1]

Pearl Jam has been praised for its rejection of rock star excess and its insistence on backing causes it believes in. Music critic Jim DeRogatis said in the aftermath of the band's battle with Ticketmaster that it "proved that a rock band which isn't comprised of greed heads can play stadiums and not milk the audience for every last dime... it indicated that idealism in rock 'n' roll is not the sole province of those '60s bands enshrined in the Rock and Roll Hall of Fame." [143] Eric Weisbard of *Spin* said in 2001, "The group that was once accused of being synthetic grunge now seem as organic and principled a rock band as exists." [15] In a 2005 *USA Today* reader's poll, Pearl Jam was voted the greatest American rock band of all time.[144] In April 2006, Pearl Jam was awarded the prize for "Best Live Act" in *Esquire's* Esqy Music Awards.

The blurb called Pearl Jam "the rare superstars who still play as though each show could be their last." [145] Pearl Jam's fanbase following has been compared to that of the Grateful Dead's, with Rolling Stone magazine stating that Pearl Jam "toured incessantly and became one of rock's great arena acts, attracting a fanatical, Grateful Dead-like cult following with marathon, true-believer shows in the vanishing spirit of Bruce Springsteen, the Who and U2." [1]

When asked about Pearl Jam's legacy in a 2000 interview, Vedder said, "I think at some point along the way we began feeling we wanted to give people something to believe in because we all had bands that gave that to us when we needed something to believe in. That was the big challenge for us after the first record and the response to it. The goal immediately became how do we continue to be musicians and grow and survive in view of all this... The answers weren't always easy, but I think we found a way." [146] The band have also been credited for inspiring the indie rock scene of 90s-era urban Pakistan, that has since evolved into a rich rock music culture in the country. [147]

[edit] Campaigning and activism

Throughout its career, Pearl Jam has promoted wider social and political issues, from pro-choice sentiments to opposition to George W. Bush's presidency. Vedder acts as the band's spokesman on these issues. The band has promoted an array of causes, including awareness of Crohn's disease, which Mike McCready suffers from, Ticketmaster venue monopolization and the environment and wildlife protection, among others. [148] [149] Guitarist Stone Gossard has been active in environmental pursuits, and has been an advocate of Pearl Jam's carbon neutral policy, offsetting the band's environmental impact. [150] Vedder has advocated for the release of the West Memphis 3 for years and Damien Echols, a member of the three, shares a writing credit for the song "Army Reserve" (from Pearl Jam). [151]

The band, and especially frontman Eddie Vedder, have been vocal supporters of the pro-choice movement. In 1992, Spin printed an article by Vedder, entitled "Reclamation", which detailed his views on abortion. [152] In an MTV Unplugged concert the same year, Vedder stood on a stool and wrote "PRO-CHOICE!" on his arm in protest when the band performed the song "Porch". [15] The band are members of a number of pro-choice organizations, including Choice USA and Voters for Choice. [149]

As members of Rock the Vote and Vote for Change, the band has encouraged voter registration and participation in United States elections. Vedder was outspoken in support of Green Party presidential candidate Ralph Nader in 2000, [153] and Pearl Jam played a series of concerts on the Vote for Change tour in October 2004, supporting the candidacy of John Kerry for U.S. President. In a Rolling Stone feature showcasing the Vote for Change tour's performers, Vedder told the magazine, "I supported Ralph Nader in 2000, but it's a time of crisis. We have to get a new administration in." [154]

Vedder sometimes comments on politics between songs, often to criticize U.S. foreign policy, and a number of his songs, including "Bu\$hleaguer" and "World Wide Suicide", are openly critical of the Bush administration. At Lollapalooza 2007, Vedder spoke out against BP Amoco dumping effluent in Lake Michigan, [155] and at the end of "Daughter", he sang the lyrics "George Bush leave this world alone/George Bush find yourself another home". In the beginning of the second encore Vedder invited Iraq war veteran Tomas Young, the subject of the documentary Body of War, onto the stage to urge an end to the war. Young in turn introduced Ben Harper, who contributed vocals to "No More" and "Rockin' in the Free World". [156] The band has since discovered that some of the Bush-related lyrics were excised from the AT&T webcast of the event, and are questioning whether that constitutes censorship. [157] AT&T later apologized and blamed the censorship on contractor Davie Brown Entertainment. [158]

Pearl Jam has performed numerous benefit concerts in aid of charities. For example, the band headlined a Seattle concert in 2001 to support the United Nations' efforts to combat world hunger. [159] The band added a date at the Chicago House of Blues to its 2005 tour to help the victims of Hurricane

Katrina; the concert proceeds were donated to Habitat for Humanity, the American Red Cross and the Jazz Foundation of America.[160]

In 2011, Pearl Jam was named 2011 Planet Defenders by Rock The Earth for their environmental activism and their large-scale efforts to decrease their own carbon emissions.[161]

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The atom is a basic unit of matter that consists of a dense central nucleus surrounded by a cloud of negatively charged electrons. The atomic nucleus contains a mix of positively charged protons and electrically neutral neutrons (except in the case of hydrogen-1, which is the only stable nuclide with no neutrons). The electrons of an atom are bound to the nucleus by the electromagnetic force. Likewise, a group of atoms can remain bound to each other by chemical bonds based on the same force, forming a molecule. An atom containing an equal number of protons and electrons is electrically neutral, otherwise it is positively or negatively charged and is known as an ion. An atom is classified according to the number of protons and neutrons in its

nucleus: the number of protons determines the chemical element, and the number of neutrons determines the isotope of the element.[1]

Chemical atoms, which in science now carry the simple name of "atom," are minuscule objects with diameters of a few tenths of a nanometer and tiny masses proportional to the volume implied by these dimensions. Atoms can only be observed individually using special instruments such as the scanning tunneling microscope. Over 99.94% of an atom's mass is concentrated in the nucleus,[note 1] with protons and neutrons having roughly equal mass. Each element has at least one isotope with an unstable nucleus that can undergo radioactive decay. This can result in a transmutation that changes the number of protons or neutrons in a nucleus.[2] Electrons that are bound to atoms possess a set of stable energy levels, or orbitals, and can undergo transitions between them by absorbing or emitting photons that match the energy differences between the levels. The electrons determine the chemical properties of an element, and strongly influence an atom's magnetic properties. The principles of quantum mechanics have been successfully used to model the observed properties of the atom.

Etymology

The name atom comes from the Greek ἄτομος (*atomos*, "indivisible") from ἀ- (*a-*, "not") and τέμνω (*temnō*, "I cut"),[3] which means uncuttable, or indivisible, something that cannot be divided further.[4] The concept of an atom as an indivisible component of matter was first proposed by early Indian and Greek philosophers. In the 18th and 19th centuries, chemists provided a physical basis for this idea by showing that certain substances could not be further broken down by chemical methods, and they applied the ancient philosophical name of atom to the chemical entity. During the late 19th and early 20th centuries, physicists discovered subatomic components and structure inside the atom, thereby demonstrating that the chemical "atom" was divisible and that the name might not be appropriate.[5]. However, it was retained. This has led to some debate about whether the ancient philosophers, who intended to refer to fundamental individual objects with their concept of "atoms," were referring to modern chemical atoms, or something more like indivisible subatomic particles such as leptons or quarks, or even some more fundamental particle that has yet to be discovered.[7]

History

Main article: Atomic theory

Atomism

The concept that matter is composed of discrete units and cannot be divided into arbitrarily tiny quantities has been around for millennia, but these ideas were founded in abstract, philosophical reasoning rather than experimentation and empirical observation. The nature of atoms in philosophy varied considerably over time and between cultures and schools, and often had spiritual elements. Nevertheless, the basic idea of the atom was adopted by scientists thousands of years later because it elegantly explained new discoveries in the field of chemistry.

References to the concept of atoms date back to ancient Greece and India. In India, the *Jñānavika*, Jain, and *Cārvāka* schools of atomism may date back to the 6th century BCE. The Nyaya and Vaisheshika schools later developed theories on how atoms combined into more complex objects. In the West, the references to atoms emerged in the 5th century BCE with Leucippus, whose student, Democritus, systematized his views. In approximately 450 BCE, Democritus coined the term *ἄτομος* (Greek: ἄτομος), which means "uncuttable" or "the smallest indivisible particle of matter". Although the Indian and Greek concepts of the atom were based purely on philosophy, modern science has retained the name coined by Democritus.

Corpuscularianism is the postulate, expounded in the 13th-century by the alchemist Pseudo-Geber (Geber), sometimes identified with Paul of Taranto, that all physical bodies possess an inner and outer layer of minute particles or corpuscles. Corpuscularianism is similar to the theory of atomism, except that where atoms were supposed to be indivisible, corpuscles could in principle be

divided. In this manner, for example, it was theorized that mercury could penetrate into metals and modify their inner structure.[13] Corpuscularianism stayed a dominant theory over the next several hundred years.

In 1661, natural philosopher Robert Boyle published *The Sceptical Chymist* in which he argued that matter was composed of various combinations of different "corpuscles" or atoms, rather than the classical elements of air, earth, fire and water. During the 1670s corpuscularianism was used by Isaac Newton in his development of the corpuscular theory of light.[15]

Origin of scientific theory

Further progress in the understanding of atoms did not occur until the science of chemistry began to develop. In 1789, French nobleman and scientific researcher Antoine Lavoisier discovered the law of conservation of mass and defined an element as a basic substance that could not be further broken down by the methods of chemistry.[16]

In 1805, English instructor and natural philosopher John Dalton used the concept of atoms to explain why elements always react in ratios of small whole numbers (the law of multiple proportions) and why certain gases dissolved better in water than others. He proposed that each element consists of atoms of a single, unique type, and that these atoms can join together to form chemical compounds. Dalton is considered the originator of modern atomic theory.

Dalton's atomic hypothesis did not specify the size of atoms. Common sense indicated they must be very small, but nobody knew how small. Therefore it was a major landmark when in 1865 Johann Josef Loschmidt measured the size of the molecules that make up air.

An additional line of reasoning in support of particle theory (and by extension atomic theory) began in 1827 when botanist Robert Brown used a microscope to look at dust grains floating in water and discovered that they moved about erraticallyâ ~a phenomenon that became known as "Brownian motion". J. Desaulx suggested in 1877 that the phenomenon was caused by the thermal motion of water molecules, and in 1905 Albert Einstein produced the first mathematical analysis of the motion.[20][22] French physicist Jean Perrin used Einstein's work to experimentally determine the mass and dimensions of atoms, thereby conclusively verifying Dalton's atomic theory.[23]

In 1869, building upon earlier discoveries by such scientists as Lavoisier, Dmitri Mendeleev published the first functional periodic table.[24] The table itself is a visual representation of the periodic law, which states that certain chemical properties of elements repeat periodically when arranged by atomic number.

Subcomponents and quantum theory

The physicist J. J. Thomson, through his work on cathode rays in 1897, discovered the electron, and concluded that they were a component of every atom. Thus he overturned the belief that atoms are the indivisible, ultimate particles of matter.[26] Thomson postulated that the low mass, negatively charged electrons were distributed throughout the atom, possibly rotating in rings, with their charge balanced by the presence of a uniform sea of positive charge. This later became known as the plum pudding model.

In 1909, Hans Geiger and Ernest Marsden, under the direction of physicist Ernest Rutherford, bombarded a sheet of gold foil with alpha raysâ ~by then known to be positively charged helium atomsâ ~and discovered that a small percentage of these particles were deflected through much larger angles than was predicted using Thomson's proposal. Rutherford interpreted the gold foil experiment as suggesting that the positive charge of a heavy gold atom and most of its mass was concentrated in a nucleus at the center of the atomâ ~the Rutherford model.[27]

While experimenting with the products of radioactive decay, in 1913 radiochemist Frederick Soddy discovered that there appeared to be more than one type of atom at each position on the periodic table.[28] The term isotope was coined by Margaret Todd as a suitable name for different atoms that belong to the same element. J.J. Thomson created a technique for separating atom types through his work on ionized gases, which subsequently led to the discovery of

stable isotopes.[29]

Meanwhile, in 1913, physicist Niels Bohr suggested that the electrons were confined into clearly defined, quantized orbits, and could jump between these, but could not freely spiral inward or outward in intermediate states.[30] An electron must absorb or emit specific amounts of energy to transition between these fixed orbits. When the light from a heated material was passed through a prism, it produced a multi-colored spectrum. The appearance of fixed lines in this spectrum was successfully explained by these orbital transitions.[31]

Later in the same year Henry Moseley provided additional experimental evidence in favor of Niels Bohr's theory. These results refined Ernest Rutherford's and Antonius Van den Broek's model, which proposed that the atom contains in its nucleus a number of positive nuclear charges that is equal to its (atomic) number in the periodic table. Until these experiments, atomic number was not known to be a physical and experimental quantity. That it is equal to the atomic nuclear charge remains the accepted atomic model today.

Chemical bonds between atoms were now explained, by Gilbert Newton Lewis in 1916, as the interactions between their constituent electrons.[33] As the chemical properties of the elements were known to largely repeat themselves according to the periodic law, in 1919 the American chemist Irving Langmuir suggested that this could be explained if the electrons in an atom were connected or clustered in some manner. Groups of electrons were thought to occupy a set of electron shells about the nucleus.[35]

The Stern-Gerlach experiment of 1922 provided further evidence of the quantum nature of the atom. When a beam of silver atoms was passed through a specially shaped magnetic field, the beam was split based on the direction of an atom's angular momentum, or spin. As this direction is random, the beam could be expected to spread into a line. Instead, the beam was split into two parts, depending on whether the atomic spin was oriented up or down.[36]

In 1924, Louis de Broglie proposed that all particles behave to an extent like waves. In 1926, Erwin Schrödinger used this idea to develop a mathematical model of the atom that described the electrons as three-dimensional waveforms rather than point particles. A consequence of using waveforms to describe particles is that it is mathematically impossible to obtain precise values for both the position and momentum of a particle at the same time; this became known as the uncertainty principle, formulated by Werner Heisenberg in 1926. In this concept, for a given accuracy in measuring a position one could only obtain a range of probable values for momentum, and vice versa. This model was able to explain observations of atomic behavior that previous models could not, such as certain structural and spectral patterns of atoms larger than hydrogen. Thus, the planetary model of the atom was discarded in favor of one that described atomic orbital zones around the nucleus where a given electron is most likely to be observed.[37][38]

The development of the mass spectrometer allowed the exact mass of atoms to be measured. The device uses a magnet to bend the trajectory of a beam of ions, and the amount of deflection is determined by the ratio of an atom's mass to its charge. The chemist Francis William Aston used this instrument to show that isotopes had different masses. The atomic mass of these isotopes varied by integer amounts, called the whole number rule.[39] The explanation for these different isotopes awaited the discovery of the neutron, a neutral-charged particle with a mass similar to the proton, by the physicist James Chadwick in 1932. Isotopes were then explained as elements with the same number of protons, but different numbers of neutrons within the nucleus.[40]

Fission, high-energy physics and condensed matter

In 1938, the German chemist Otto Hahn, a student of Rutherford, directed neutrons onto uranium atoms expecting to get transuranium elements. Instead, his chemical experiments showed barium as a product.[41] A year later, Lise Meitner and her nephew Otto Frisch verified that Hahn's result were the first experimental nuclear fission.[42][43] In 1944, Hahn received the Nobel prize in chemistry. Despite Hahn's efforts, the contributions of Meitner and Frisch were not recognized.[44]

In the 1950s, the development of improved particle accelerators and particle detectors allowed scientists to study the impacts of atoms moving at high energies.[45] Neutrons and protons were found to be hadrons, or composites of smaller particles called quarks. The standard model of particle physics was developed that so far has successfully explained the properties of the nucleus in terms of these sub-atomic particles and the forces that govern their interactions.[46]

Components

Subatomic particles

Though the word atom originally denoted a particle that cannot be cut into smaller particles, in modern scientific usage the atom is composed of various subatomic particles. The constituent particles of an atom are the electron, the proton and the neutron. However, the hydrogen-1 atom has no neutrons and a positive hydrogen ion has no electrons.

The electron is by far the least massive of these particles at 9.11×10^{-31} kg, with a negative electrical charge and a size that is too small to be measured using available techniques. Protons have a positive charge and a mass 1,836 times that of the electron, at 1.6726×10^{-27} kg, although this can be reduced by changes to the energy binding the proton into an atom. Neutrons have no electrical charge and have a free mass of 1,839 times the mass of electrons, or 1.6929×10^{-27} kg. Neutrons and protons have comparable dimensions—on the order of 2.5×10^{-15} m—although the 'surface' of these particles is not sharply defined.

In the Standard Model of physics, electrons are truly elementary particles with no internal structure. However, both protons and neutrons are composite particles composed of elementary particles called quarks. There are two types of quarks in atoms, each having a fractional electric charge. Protons are composed of two up quarks (each with charge $+\frac{2}{3}$) and one down quark (with a charge of $-\frac{1}{3}$). Neutrons consist of one up quark and two down quarks. This distinction accounts for the difference in mass and charge between the two particles.[50][51]

The quarks are held together by the strong interaction (or strong force), which is mediated by gluons. The protons and neutrons, in turn, are held to each other in the nucleus by the nuclear force, which is a residuum of the strong force that has somewhat different range-properties (see the article on the nuclear force for more). The gluon is a member of the family of gauge bosons, which are elementary particles that mediate physical forces.[50][51]

Nucleus

Main article: Atomic nucleus

All the bound protons and neutrons in an atom make up a tiny atomic nucleus, and are collectively called nucleons. The radius of a nucleus is approximately equal to $r_0 A^{1/3}$, where A is the total number of nucleons. This is much smaller than the radius of the atom, which is on the order of 10^5 fm. The nucleons are bound together by a short-ranged attractive potential called the residual strong force. At distances smaller than 2.5 fm this force is much more powerful than the electrostatic force that causes positively charged protons to repel each other.

Atoms of the same element have the same number of protons, called the atomic number. Within a single element, the number of neutrons may vary, determining the isotope of that element. The total number of protons and neutrons determine the nuclide. The number of neutrons relative to the protons determines the stability of the nucleus, with certain isotopes undergoing radioactive decay.[54]

The neutron and the proton are different types of fermions. The Pauli exclusion principle is a quantum mechanical effect that prohibits identical fermions, such as multiple protons, from occupying the same quantum physical state at the same time. Thus every proton in the nucleus must occupy a different state, with its own energy level, and the same rule applies to all of the neutrons. This prohibition does not apply to a proton and neutron occupying the same quantum state.[55]

For atoms with low atomic numbers, a nucleus that has a different number of protons than neutrons can potentially drop to a lower energy state through a radioactive decay that causes the number of protons and neutrons to more closely match. As a result, atoms with roughly matching numbers of protons and neutrons are more stable against decay. However, with increasing atomic number, the mutual repulsion of the protons requires an increasing proportion of neutrons to maintain the stability of the nucleus, which modifies this trend. Thus, there are no stable nuclei with equal proton and neutron numbers above atomic number $Z = 20$ (calcium); and as Z increases toward the heaviest nuclei, the ratio of neutrons per proton required for stability increases to about 1.5.[55]

The number of protons and neutrons in the atomic nucleus can be modified, although this can require very high energies because of the strong force. Nuclear fusion occurs when multiple atomic particles join to form a heavier nucleus, such as through the energetic collision of two nuclei. For example, at the core of the Sun protons require energies of 3×10 keV to overcome their mutual repulsion—the coulomb barrier—and fuse together into a single nucleus.[56] Nuclear fission is the opposite process, causing a nucleus to split into two smaller nuclei—usually through radioactive decay. The nucleus can also be modified through bombardment by high energy subatomic particles or photons. If this modifies the number of protons in a nucleus, the atom changes to a different chemical element.[57][58]

If the mass of the nucleus following a fusion reaction is less than the sum of the masses of the separate particles, then the difference between these two values can be emitted as a type of usable energy (such as a gamma ray, or the kinetic energy of a beta particle), as described by Albert Einstein's mass–energy equivalence formula, $E = mc^2$, where m is the mass loss and c is the speed of light. This deficit is part of the binding energy of the new nucleus, and it is the non-recoverable loss of the energy that causes the fused particles to remain together in a state that requires this energy to separate.

The fusion of two nuclei that create larger nuclei with lower atomic numbers than iron and nickel—a total nucleon number of about 60—is usually an exothermic process that releases more energy than is required to bring them together.[60] It is this energy-releasing process that makes nuclear fusion in stars a self-sustaining reaction. For heavier nuclei, the binding energy per nucleon in the nucleus begins to decrease. That means fusion processes producing nuclei that have atomic numbers higher than about 26, and atomic masses higher than about 60, is an endothermic process. These more massive nuclei can not undergo an energy-producing fusion reaction that can sustain the hydrostatic equilibrium of a star.[55]

Electron cloud

The electrons in an atom are attracted to the protons in the nucleus by the electromagnetic force. This force binds the electrons inside an electrostatic potential well surrounding the smaller nucleus, which means that an external source of energy is needed for the electron to escape. The closer an electron is to the nucleus, the greater the attractive force. Hence electrons bound near the center of the potential well require more energy to escape than those at greater separations.

Electrons, like other particles, have properties of both a particle and a wave. The electron cloud is a region inside the potential well where each electron forms a type of three-dimensional standing wave—a wave form that does not move relative to the nucleus. This behavior is defined by an atomic orbital, a mathematical function that characterises the probability that an electron appears to be at a particular location when its position is measured.[61] Only a discrete (or quantized) set of these orbitals exist around the nucleus, as other possible wave patterns rapidly decay into a more stable form.[62] Orbitals can have one or more ring or node structures, and they differ from each other in size, shape and orientation.[63]

Each atomic orbital corresponds to a particular energy level of the electron. The electron can change its state to a higher energy level by absorbing a

photon with sufficient energy to boost it into the new quantum state. Likewise, through spontaneous emission, an electron in a higher energy state can drop to a lower energy state while radiating the excess energy as a photon. These characteristic energy values, defined by the differences in the energies of the quantum states, are responsible for atomic spectral lines.[62]

The amount of energy needed to remove or add an electronâthe electron binding energyâis far less than the binding energy of nucleons. For example, it requires only 13.6 eV to strip a ground-state electron from a hydrogen atom,[64] compared to 2.23 million eV for splitting a deuterium nucleus.[65] Atoms are electrically neutral if they have an equal number of protons and electrons. Atoms that have either a deficit or a surplus of electrons are called ions. Electrons that are farthest from the nucleus may be transferred to other nearby atoms or shared between atoms. By this mechanism, atoms are able to bond into molecules and other types of chemical compounds like ionic and covalent network crystals.

Properties

Nuclear properties

By definition, any two atoms with an identical number of protons in their nuclei belong to the same chemical element. Atoms with equal numbers of protons but a different number of neutrons are different isotopes of the same element. For example, all hydrogen atoms admit exactly one proton, but isotopes exist with no neutrons (hydrogen-1, by far the most common form,[67] also called protium), one neutron (deuterium), two neutrons (tritium) and more than two neutrons. The known elements form a set of atomic numbers, from the single proton element hydrogen up to the 118-proton element ununoctium.[68] All known isotopes of elements with atomic numbers greater than 82 are radioactive.[70]

About 339 nuclides occur naturally on Earth,[71] of which 254 (about 75%) have not been observed to decay, and are referred to as "stable isotopes". However, only 90 of these nuclides are stable to all decay, even in theory. Another 164 (bringing the total to 254) have not been observed to decay, even though in theory it is energetically possible. These are also formally classified as "stable". An additional 34 radioactive nuclides have half-lives longer than 80 million years, and are long-lived enough to be present from the birth of the solar system. This collection of 288 nuclides are known as primordial nuclides. Finally, an additional 51 short-lived nuclides are known to occur naturally, as daughter products of primordial nuclide decay (such as radium from uranium), or else as products of natural energetic processes on Earth, such as cosmic ray bombardment (for example, carbon-14).[72][note 2]

For 80 of the chemical elements, at least one stable isotope exists. As a rule, there is only a handful of stable isotopes for each of these elements, the average being 3.2 stable isotopes per element. Twenty-six elements have only a single stable isotope, while the largest number of stable isotopes observed for any element is ten, for the element tin. Elements 43, 61, and all elements numbered 83 or higher have no stable isotopes.[73][page needed]

Stability of isotopes is affected by the ratio of protons to neutrons, and also by the presence of certain "magic numbers" of neutrons or protons that represent closed and filled quantum shells. These quantum shells correspond to a set of energy levels within the shell model of the nucleus; filled shells, such as the filled shell of 50 protons for tin, confers unusual stability on the nuclide. Of the 254 known stable nuclides, only four have both an odd number of protons and odd number of neutrons: hydrogen-2 (deuterium), lithium-6, boron-10 and nitrogen-14. Also, only four naturally occurring, radioactive odd-odd nuclides have a half-life over a billion years: potassium-40, vanadium-50, lanthanum-138 and tantalum-180m. Most odd-odd nuclei are highly unstable with respect to beta decay, because the decay products are even-even, and are therefore more strongly bound, due to nuclear pairing effects.[73][page needed]

Mass

The large majority of an atom's mass comes from the protons and neutrons that make it up. The total number of these particles (called "nucleons") in a given

atom is called the mass number. The mass number is a simple whole number, and has units of "nucleons." An example of use of a mass number is "carbon-12," which has 12 nucleons (six protons and six neutrons).

The actual mass of an atom at rest is often expressed using the unified atomic mass unit (u), which is also called a dalton (Da). This unit is defined as a twelfth of the mass of a free neutral atom of carbon-12, which is approximately 1.66×10^{-27} kg.[74] Hydrogen-1, the lightest isotope of hydrogen and the atom with the lowest mass, has an atomic weight of 1.007825 u.[75] The value of this number is called the atomic mass. A given atom has an atomic mass approximately equal (within 1%) to its mass number times the mass of the atomic mass unit. However, this number will not be an exact whole number except in the case of carbon-12 (see below)[76] The heaviest stable atom is lead-208, with a mass of 207.9766521 u.[77]

As even the most massive atoms are far too light to work with directly, chemists instead use the unit of moles. One mole of atoms of any element always has the same number of atoms (about 6.022×10^{23}). This number was chosen so that if an element has an atomic mass of 1 u, a mole of atoms of that element has a mass close to one gram. Because of the definition of the unified atomic mass unit, each carbon-12 atom has an atomic mass of exactly 12 u, and so a mole of carbon-12 atoms weighs exactly 0.012 kg.[74][page needed]

Shape and size

Main article: Atomic radius

Atoms lack a well-defined outer boundary, so their dimensions are usually described in terms of an atomic radius. This is a measure of the distance out to which the electron cloud extends from the nucleus. However, this assumes the atom to exhibit a spherical shape, which is only obeyed for atoms in vacuum or free space. Atomic radii may be derived from the distances between two nuclei when the two atoms are joined in a chemical bond. The radius varies with the location of an atom on the atomic chart, the type of chemical bond, the number of neighboring atoms (coordination number) and a quantum mechanical property known as spin.[78] On the periodic table of the elements, atom size tends to increase when moving down columns, but decrease when moving across rows (left to right).[79] Consequently, the smallest atom is helium with a radius of 32 pm, while one of the largest is caesium at 225 pm.[80]

When subjected to external fields, like an electrical field, the shape of an atom may deviate from that of a sphere. The deformation depends on the field magnitude and the orbital type of outer shell electrons, as shown by group-theoretical considerations. Aspherical deviations might be elicited for instance in crystals, where large crystal-electrical fields may occur at low-symmetry lattice sites.[81] Significant ellipsoidal deformations have recently been shown to occur for sulfur ions in pyrite-type compounds.[82]

Atomic dimensions are thousands of times smaller than the wavelengths of light (400 – 700 nm) so they can not be viewed using an optical microscope. However, individual atoms can be observed using a scanning tunneling microscope. To visualize the minuteness of the atom, consider that a typical human hair is about 1 million carbon atoms in width.[83] A single drop of water contains about 2 sextillion (2×10^{21}) atoms of oxygen, and twice the number of hydrogen atoms.[84] A single carat diamond with a mass of 2×10^{-4} kg contains about 10^{22} atoms of carbon.[note 3] If an apple were magnified to the size of the Earth, then the atoms in the apple would be approximately the size of the original apple.

Radioactive decay

Every element has one or more isotopes that have unstable nuclei that are subject to radioactive decay, causing the nucleus to emit particles or electromagnetic radiation. Radioactivity can occur when the radius of a nucleus is large compared with the radius of the strong force, which only acts over distances on the order of 1 fm.[86]

The most common forms of radioactive decay are:[88]

Alpha decay is caused when the nucleus emits an alpha particle, which is a helium nucleus consisting of two protons and two neutrons. The result of the

emission is a new element with a lower atomic number.

Beta decay (and electron capture) are regulated by the weak force, and result from a transformation of a neutron into a proton, or a proton into a neutron. The first is accompanied by the emission of an electron and an antineutrino, while the second causes the emission of a positron and a neutrino. The electron or positron emissions are called beta particles. Beta decay either increases or decreases the atomic number of the nucleus by one. An analog of positron beta decay in nuclei that are proton-rich is electron capture, a process even more common than positron emission since it requires less energy. In this type of decay an electron is absorbed by the nucleus, rather than a positron emitted. A neutrino is still emitted in this process, and a proton again changes to a neutron.

Gamma decay results from a change in the energy level of the nucleus to a lower state, resulting in the emission of electromagnetic radiation. This can occur following the emission of an alpha or a beta particle from radioactive decay.

Other more rare types of radioactive decay include ejection of neutrons or protons or clusters of nucleons from a nucleus, or more than one beta particle, or result (through internal conversion) in production of high-speed electrons that are not beta rays, and high-energy photons that are not gamma rays. A few large nuclei explode into two or more charged fragments of varying masses plus several neutrons, in a decay called spontaneous nuclear fission. Each radioactive isotope has a characteristic decay time period—the half-life—that is determined by the amount of time needed for half of a sample to decay. This is an exponential decay process that steadily decreases the proportion of the remaining isotope by 50% every half-life. Hence after two half-lives have passed only 25% of the isotope is present, and so forth.[86]

Magnetic moment

Elementary particles possess an intrinsic quantum mechanical property known as spin. This is analogous to the angular momentum of an object that is spinning around its center of mass, although strictly speaking these particles are believed to be point-like and cannot be said to be rotating. Spin is measured in units of the reduced Planck constant (\hbar), with electrons, protons and neutrons all having spin $\frac{1}{2}\hbar$, or "spin- $\frac{1}{2}$ ". In an atom, electrons in motion around the nucleus possess orbital angular momentum in addition to their spin, while the nucleus itself possesses angular momentum due to its nuclear spin.[89]

The magnetic field produced by an atom—its magnetic moment—is determined by these various forms of angular momentum, just as a rotating charged object classically produces a magnetic field. However, the most dominant contribution comes from spin. Due to the nature of electrons to obey the Pauli exclusion principle, in which no two electrons may be found in the same quantum state, bound electrons pair up with each other, with one member of each pair in a spin up state and the other in the opposite, spin down state. Thus these spins cancel each other out, reducing the total magnetic dipole moment to zero in some atoms with even number of electrons.[90]

In ferromagnetic elements such as iron, an odd number of electrons leads to an unpaired electron and a net overall magnetic moment. The orbitals of neighboring atoms overlap and a lower energy state is achieved when the spins of unpaired electrons are aligned with each other, a process known as an exchange interaction. When the magnetic moments of ferromagnetic atoms are lined up, the material can produce a measurable macroscopic field. Paramagnetic materials have atoms with magnetic moments that line up in random directions when no magnetic field is present, but the magnetic moments of the individual atoms line up in the presence of a field.[90][91]

The nucleus of an atom can also have a net spin. Normally these nuclei are aligned in random directions because of thermal equilibrium. However, for certain elements (such as xenon-129) it is possible to polarize a significant proportion of the nuclear spin states so that they are aligned in the same direction—a condition called hyperpolarization. This has important applications in magnetic resonance imaging.[92]

Energy levels

The potential energy of an electron in an atom is negative, its dependence of its position reaches the minimum (the most absolute value) inside the nucleus, and vanishes when the distance from the nucleus goes to infinity, roughly in an inverse proportion to the distance. In the quantum-mechanical model, a bound electron can only occupy a set of states centered on the nucleus, and each state corresponds to a specific energy level; see time-independent Schrödinger equation for theoretical explanation. An energy level can be measured by the amount of energy needed to unbind the electron from the atom, and is usually given in units of electronvolts (eV). The lowest energy state of a bound electron is called the ground state, [clarification needed] while an electron transition to a higher level results in an excited state. [94] The electron's energy raises when n increases because the (average) distance to the nucleus increases. Dependence of the energy on n is caused not by electrostatic potential of the nucleus, but by interaction between electrons.

For an electron to transition between two different states, it must [citation needed] absorb or emit a photon at an energy matching the difference in the potential energy of those levels. The energy of an emitted photon is proportional to its frequency, so these specific energy levels appear as distinct bands in the electromagnetic spectrum. [95] Each element has a characteristic spectrum that can depend on the nuclear charge, subshells filled by electrons, the electromagnetic interactions between the electrons and other factors. [96]

When a continuous spectrum of energy is passed through a gas or plasma, some of the photons are absorbed by atoms, causing electrons to change their energy level. Those excited electrons that remain bound to their atom spontaneously emit this energy as a photon, traveling in a random direction, and so drop back to lower energy levels. Thus the atoms behave like a filter that forms a series of dark absorption bands in the energy output. (An observer viewing the atoms from a view that does not include the continuous spectrum in the background, instead sees a series of emission lines from the photons emitted by the atoms.) Spectroscopic measurements of the strength and width of atomic spectral lines allow the composition and physical properties of a substance to be determined. [97]

Close examination of the spectral lines reveals that some display a fine structure splitting. This occurs because of spin-orbit coupling, which is an interaction between the spin and motion of the outermost electron. [98] When an atom is in an external magnetic field, spectral lines become split into three or more components; a phenomenon called the Zeeman effect. This is caused by the interaction of the magnetic field with the magnetic moment of the atom and its electrons. Some atoms can have multiple electron configurations with the same energy level, which thus appear as a single spectral line. The interaction of the magnetic field with the atom shifts these electron configurations to slightly different energy levels, resulting in multiple spectral lines. [99] The presence of an external electric field can cause a comparable splitting and shifting of spectral lines by modifying the electron energy levels, a phenomenon called the Stark effect.

If a bound electron is in an excited state, an interacting photon with the proper energy can cause stimulated emission of a photon with a matching energy level. For this to occur, the electron must drop to a lower energy state that has an energy difference matching the energy of the interacting photon. The emitted photon and the interacting photon then move off in parallel and with matching phases. That is, the wave patterns of the two photons are synchronized. This physical property is used to make lasers, which can emit a coherent beam of light energy in a narrow frequency band. [101]

Valence and bonding behavior

The outermost electron shell of an atom in its uncombined state is known as the valence shell, and the electrons in that shell are called valence electrons. The number of valence electrons determines the bonding behavior with other atoms. Atoms tend to chemically react with each other in a manner that

fills (or empties) their outer valence shells.[102] For example, a transfer of a single electron between atoms is a useful approximation for bonds that form between atoms with one-electron more than a filled shell, and others that are one-electron short of a full shell, such as occurs in the compound sodium chloride and other chemical ionic salts. However, many elements display multiple valences, or tendencies to share differing numbers of electrons in different compounds. Thus, chemical bonding between these elements takes many forms of electron-sharing that are more than simple electron transfers. Examples include the element carbon and the organic compounds.[103]

The chemical elements are often displayed in a periodic table that is laid out to display recurring chemical properties, and elements with the same number of valence electrons form a group that is aligned in the same column of the table. (The horizontal rows correspond to the filling of a quantum shell of electrons.) The elements at the far right of the table have their outer shell completely filled with electrons, which results in chemically inert elements known as the noble gases.[104][105]

States

Quantities of atoms are found in different states of matter that depend on the physical conditions, such as temperature and pressure. By varying the conditions, materials can transition between solids, liquids, gases and plasmas. Within a state, a material can also exist in different allotropes. An example of this is solid carbon, which can exist as graphite or diamond.[107] Gaseous allotropes exist as well, such as dioxygen and ozone.

At temperatures close to absolute zero, atoms can form a Bose-Einstein condensate, at which point quantum mechanical effects, which are normally only observed at the atomic scale, become apparent on a macroscopic scale.[109] This super-cooled collection of atoms then behaves as a single super atom, which may allow fundamental checks of quantum mechanical behavior.[110]

Identification

The scanning tunneling microscope is a device for viewing surfaces at the atomic level. It uses the quantum tunneling phenomenon, which allows particles to pass through a barrier that would normally be insurmountable. Electrons tunnel through the vacuum between two planar metal electrodes, on each of which is an adsorbed atom, providing a tunneling-current density that can be measured. Scanning one atom (taken as the tip) as it moves past the other (the sample) permits plotting of tip displacement versus lateral separation for a constant current. The calculation shows the extent to which scanning-tunneling-microscope images of an individual atom are visible. It confirms that for low bias, the microscope images the space-averaged dimensions of the electron orbitals across closely packed energy levels—the Fermi level local density of states.[111][112]

An atom can be ionized by removing one of its electrons. The electric charge causes the trajectory of an atom to bend when it passes through a magnetic field. The radius by which the trajectory of a moving ion is turned by the magnetic field is determined by the mass of the atom. The mass spectrometer uses this principle to measure the mass-to-charge ratio of ions. If a sample contains multiple isotopes, the mass spectrometer can determine the proportion of each isotope in the sample by measuring the intensity of the different beams of ions. Techniques to vaporize atoms include inductively coupled plasma atomic emission spectroscopy and inductively coupled plasma mass spectrometry, both of which use a plasma to vaporize samples for analysis.[113]

A more area-selective method is electron energy loss spectroscopy, which measures the energy loss of an electron beam within a transmission electron microscope when it interacts with a portion of a sample. The atom-probe tomograph has sub-nanometer resolution in 3-D and can chemically identify individual atoms using time-of-flight mass spectrometry.[114]

Spectra of excited states can be used to analyze the atomic composition of distant stars. Specific light wavelengths contained in the observed light from stars can be separated out and related to the quantized transitions in free gas atoms. These colors can be replicated using a gas-discharge lamp containing the

same element.[115] Helium was discovered in this way in the spectrum of the Sun 23 years before it was found on Earth.[116]

Origin and current state

Atoms form about 4% of the total energy density of the observable universe, with an average density of about 0.25 atoms/m^3 . [117] Within a galaxy such as the Milky Way, atoms have a much higher concentration, with the density of matter in the interstellar medium (ISM) ranging from 10^5 to 10^9 atoms/m^3 . The Sun is believed to be inside the Local Bubble, a region of highly ionized gas, so the density in the solar neighborhood is only about 10^3 atoms/m^3 . [119] Stars form from dense clouds in the ISM, and the evolutionary processes of stars result in the steady enrichment of the ISM with elements more massive than hydrogen and helium. Up to 95% of the Milky Way's atoms are concentrated inside stars and the total mass of atoms forms about 10% of the mass of the galaxy. (The remainder of the mass is an unknown dark matter.) [121]

Nucleosynthesis

Stable protons and electrons appeared one second after the Big Bang. During the following three minutes, Big Bang nucleosynthesis produced most of the helium, lithium, and deuterium in the universe, and perhaps some of the beryllium and boron. [122][123][124] The first atoms (complete with bound electrons) were theoretically created 380,000 years after the Big Bang an epoch called recombination, when the expanding universe cooled enough to allow electrons to become attached to nuclei. [125]

Since the Big Bang, which produced no carbon, atomic nuclei have been combined in stars through the process of nuclear fusion to produce more of the element helium, and (via the triple alpha process) the sequence of elements from carbon up to iron. [126]

Isotopes such as lithium-6, as well as some beryllium and boron are generated in space through cosmic ray spallation. [127] This occurs when a high-energy proton strikes an atomic nucleus, causing large numbers of nucleons to be ejected.

Elements heavier than iron were produced in supernovae through the r-process and in AGB stars through the s-process, both of which involve the capture of neutrons by atomic nuclei. [128] Elements such as lead formed largely through the radioactive decay of heavier elements. [129]

Earth

Most of the atoms that make up the Earth and its inhabitants were present in their current form in the nebula that collapsed out of a molecular cloud to form the Solar System. The rest are the result of radioactive decay, and their relative proportion can be used to determine the age of the Earth through radiometric dating. [131] Most of the helium in the crust of the Earth (about 99% of the helium from gas wells, as shown by its lower abundance of helium-3) is a product of alpha decay. [132]

There are a few trace atoms on Earth that were not present at the beginning (i.e., not "primordial"), nor are results of radioactive decay. Carbon-14 is continuously generated by cosmic rays in the atmosphere. [133] Some atoms on Earth have been artificially generated either deliberately or as by-products of nuclear reactors or explosions. [134][135] Of the transuranic elements those with atomic numbers greater than 92 only plutonium and neptunium occur naturally on Earth. [136][137] Transuranic elements have radioactive lifetimes shorter than the current age of the Earth and thus identifiable quantities of these elements have long since decayed, with the exception of traces of plutonium-244 possibly deposited by cosmic dust. Natural deposits of plutonium and neptunium are produced by neutron capture in uranium ore. [139]

The Earth contains approximately 1.33×10^{50} atoms. [140] In the planet's atmosphere, small numbers of independent atoms of noble gases exist, such as argon and neon. The remaining 99% of the atmosphere is bound in the form of molecules, including carbon dioxide and diatomic oxygen and nitrogen. At the surface of the Earth, atoms combine to form various compounds, including water, salt, silicates and oxides. Atoms can also combine to create materials that do not consist of discrete molecules, including crystals and liquid or solid

metals.[141][142] This atomic matter forms networked arrangements that lack the particular type of small-scale interrupted order associated with molecular matter.

Rare and theoretical forms

Superheavy elements

While isotopes with atomic numbers higher than lead (82) are known to be radioactive, an "island of stability" has been proposed for some elements with atomic numbers above 103. These superheavy elements may have a nucleus that is relatively stable against radioactive decay.[144] The most likely candidate for a stable superheavy atom, unbihexium, has 126 $\hat{\text{A}}$ protons and 184 $\hat{\text{A}}$ neutrons.[145]

Exotic matter

Main article: Exotic matter

Each particle of matter has a corresponding antimatter particle with the opposite electrical charge. Thus, the positron is a positively charged antielectron and the antiproton is a negatively charged equivalent of a proton. When a matter and corresponding antimatter particle meet, they annihilate each other. Because of this, along with an imbalance between the number of matter and antimatter particles, the latter are rare in the universe. (The first causes of this imbalance are not yet fully understood, although the baryogenesis theories may offer an explanation.) As a result, no antimatter atoms have been discovered in nature.[146][147] However, in 1996, antihydrogen, the antimatter counterpart of hydrogen, was synthesized at the CERN laboratory in Geneva.[148][149]

Other exotic atoms have been created by replacing one of the protons, neutrons or electrons with other particles that have the same charge. For example, an electron can be replaced by a more massive muon, forming a muonic atom. These types of atoms can be used to test the fundamental predictions of physics.[150][151][152]

See here for a list of particles under the category: Exotic atoms

See also

Notes

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External links

Bruce Castle (formerly the Lordship House) is a Grade I listed 16th-century[1]manor house in Lordship Lane, Tottenham, London. It is named after the House of Bruce who formerly owned the land on which it is built.

Believed to stand on the site of an earlier building, about which little is known, the current house is one of the oldest surviving English brick houses. It was remodelled in the 17th, 18th and 19th centuries.

The house has been home to Sir William Compton, the Barons Coleraine and Sir Rowland Hill, among others. After serving as a school during the 19th century, when a large extension was built to the west, it was converted into a museum exploring the history of the areas which constitute the present London Borough of Haringey and, on the strength of its connection with Sir Rowland Hill, the history of the Royal Mail. The building also houses the archives of the London Borough of Haringey. Since 1892 the grounds have been a public park, Tottenham's oldest.

[edit] Origins of the name

The name Bruce Castle is derived from the House of Bruce, who had historically owned a third of the manor of Tottenham. However, there was no castle in the area, and it is unlikely that the family lived nearby.[3] Upon his accession to the Scottish throne in 1306, Robert I of Scotland forfeited his lands in England, including the Bruce holdings in Tottenham,[3] ending the connection between the Bruce family and the area. The former Bruce land in Tottenham was granted to Richard Spigurnell and Thomas Hethe.[4]

The three parts of the manor of Tottenham were united in the early 15th century under the Gedeney family and have remained united since.[4] In all early records, the building is referred to as the Lordship House. The name Bruce Castle first appears to have been adopted by Henry Hare, 2nd Baron Coleraine (1635â ^1708),[3] although Daniel Lysons speculates in *The Environs of London* (1795) that the usage of the name dates to the late 13th century.[4]

[edit] Architecture

A detached, cylindrical Tudor tower stands immediately to the southeast of the house, and is generally considered to be the earliest part of the building;[5] however, Lysons believes it to have been a later addition.[4] The tower is built of local red brick, and is 21 feet (6.4Â m) tall, with walls 3 feet (0.91Â m) thick.[5] In 2006, excavations revealed that it continues for some distance below the current ground level.[6] It was described in 1829 as being over a deep well, and being used as a dairy.[7]

Sources disagree on the house's initial construction date, and no records survive of its construction. There is some archaeological evidence dating parts of the building to the 15th century;[5] William Robinson's *History and Antiquities of the Parish of Tottenham* (1840) suggests a date of about 1514,[8] although the Royal Commission on Historic Monuments attributes it to the late 16th century. Nikolaus Pevsner speculates that the front may have formed part of a courtyard house of which the remainder has disappeared.[9]

The principal facade of the Grade I mansion has been substantially remodelled over time. The house is constructed of red brick with ashlar quoining and the principal facade, terminated by symmetrical matching bays, has tall paned windows. The house and detached tower are among the earliest uses of brick as the principal building material for an English house.[10]

Henry Hare, 2nd Baron Coleraine (1635â ^1708) oversaw a substantial remodelling of the house in 1684, and much of the existing south facade dates from that time. The end bays were heightened, and the central porch was rebuilt with stone quoins and pilasters, a balustraded top and a small tower and cupola.[9] A plan from 1684 shows the hall in the centre of the house, with service rooms to the west and the main parlour to the east. On the first floor, the dining room was over the hall, the main bedchamber over the kitchen, and a lady's chamber over the porch.[9]

In the early 18th century Henry Hare, 3rd Baron Coleraine (1694â ^1749) oversaw a remodelling of the north of the house, in which an extra range of rooms was added to the north and the Coleraine coat of arms added to the pediment of the north facade.[9] In the late 18th century, under the ownership of James Townsend, the narrow east facade of the house was remodelled into an entrance front, and given the appearance of a typical Georgian house. At the same time, the gabled attics on the south front were removed, giving the southern

elevation of the house its current appearance.[9] An inventory of the house made in 1789 in preparation for its sale listed a hall, saloon, drawing room, dining room and breakfast parlour on the ground floor, with a library and billiard room on the first floor.[9]

In the early 19th century the west wing of the house was demolished, leaving it with the asymmetrical appearance that it retains today.[11] The house was converted into a school, and in 1870 a three-story extension was built in the Gothic Revival style to the northwest of the house.[9]

The 2006 excavations by the Museum of London uncovered the chalk foundations of an earlier building on the site, of which nothing is currently known.[6] Court rolls of 1742 refer to the repair of a drawbridge, implying that the building then had a moat.[5] A 1911 archaeological journal made passing reference to "the recent levelling of the moat".[12]

[edit] Early residents

It is generally believed that the first owner of the house was Sir William Compton, Groom of the Stool to Henry VIII and one of the most prominent courtiers of the period, who acquired the manor of Tottenham in 1514.[5] However, there is no recorded evidence of Compton's living in the house, and there is some evidence that the current building dates to a later period.[5]

The earliest known reference to the building dates from 1516, when Henry VIII met his sister Margaret, Queen of Scots, at "Maister Compton's House beside Tottenham".[8] The Comptons owned the building throughout the 16th century, but few records of the family or the building survive from the period.[14]

In the early 17th century the house was owned by Richard Sackville, 3rd Earl of Dorset and Lady Anne Clifford. Sackville ran up high debts through gambling and extravagant spending; the house (then still called "The Lordship House") was leased to Thomas Peniston. Peniston's wife, Martha, daughter of Sir Thomas Temple was said to be the Earl of Dorset's mistress.[15] The house was later sold to wealthy Norfolk landowner Hugh Hare.[16]

[edit] 17th century: the Hare family

[edit] Hugh Hare, 1st Baron Coleraine

Hugh Hare (1606â ^1667) had inherited a large amount of money from his great-uncle Sir Nicholas Hare, Master of the Rolls. On the death of his father, his mother had remarried Henry Montagu, 1st Earl of Manchester, allowing the young Hugh Hare to rise rapidly in Court and social circles. He married Montagu's daughter by his first marriage and purchased the manor of Tottenham, including the Lordship House, in 1625, and was ennobled as Baron Coleraine shortly thereafter.[16]

As he was closely associated with the court of Charles I, Hare's fortunes went into decline during the English Civil War. His castle at Longford and his house in Totteridge were seized by Parliamentary forces, and returned upon the Restoration in a severe state of disrepair.[16] Records of Tottenham from the period are now lost, and the ownership and condition of the Lordship House during the Commonwealth of England are unknown.[16] Hugh Hare died at his home in Totteridge in 1667, having choked to death on a bone eating turkey whilst laughing and drinking,[16] and was succeeded by his son Henry Hare, 2nd Baron Coleraine.

[edit] Henry Hare, 2nd Baron Coleraine

Henry Hare (1635â ^1708) settled at the Lordship House, renaming it Bruce Castle in honour of the area's historic connection with the House of Bruce.[3] Hare was a noted historian and author of the first history of Tottenham. He grew up at the Hare family house at Totteridge, and it is not known when he moved to Tottenham. At the time of the birth of his first child, Hugh, in 1668, the family were still living in Totteridge, while by the time of the death of his first wife Constantia, in 1680, the family were living in Bruce Castle. According to Hare, Constantia was buried in All Hallows Church in Tottenham. However, the parish register for the period is complete and makes no mention of her death or burial.[17]

Following the death of Constantia, Hare married Sarah Alston. They had been engaged in 1661, but she had instead married John Seymour, 4th Duke of

Somerset. There is evidence that during Sarah's marriage to Seymour and Hare's marriage to Constantia, a close relationship was sustained between them.[18]

The house was substantially remodelled in 1684, following Henry Hare's marriage to the dowager Duchess of Somerset, and much of the existing south facade dates from this time.[9] The facade's dominating feature is a central tower with a belvedere, a motif of the English Renaissance of the late 16th/early 17th centuries (the Compton family's Warwickshire home Castle Ashby was also given Renaissance features during the 17th century). Hatfield House, also close to London, had a similar central tower constructed in 1611, as does Blickling Hall in Norfolk, built circa 1616. However, in resemblance the house appears to favour the style of Burton Agnes Hall constructed between 1601 and 1610.

[edit] The Ghostly Lady of Bruce Castle

Although sources such as Pegram speculate that Constantia committed suicide in the face of a continued relationship between Hare and the Duchess of Somerset,[18] little is known about her life and the circumstances of her early death, and her ghost reputedly haunts the castle.[19]

The earliest recorded reference to the ghost appeared in 1858 â ^ almost two hundred years after her death â ^ in the Tottenham & Edmonton Advertiser.

A lady of our acquaintance was introduced at a party to an Indian Officer who, hearing that she came from Tottenham, eagerly asked if she had seen the Ghostly Lady of Bruce Castle. Some years before he had been told the following story by a brother officer when encamped on a march in India. One of the Lords Coleraine had married a beautiful lady and while she was yet in her youth had been seized with a violent hatred against her â ^ whether from jealousy or not is not known. He first confined her to the upper part of the house and subsequently still more closely to the little rooms of the clock turret. These rooms looked on the balconies: the lady one night succeeded in forcing her way out and flung herself with child in arms from the parapet. The wild despairing shriek aroused the household only to find her and her infant in death's clutches below. Every year as the fearful night comes round (it is in November) the wild form can be seen as she stood on the fatal parapet, and her despairing cry is heard floating away on the autumnal blast.[17][20]

The legend has now been largely forgotten, and there have been no reported sightings of the ghost in recent times.[19]

[edit] Residents in the 18th century

Sarah Hare died in 1692 and was buried in Westminster Abbey,[18] and Hare in 1708, to be succeeded by his grandson Henry Hare, 3rd Baron Coleraine. Henry Hare was a leading antiquary, residing only briefly at Bruce Castle between lengthy tours of Europe.

The house was remodelled again under the 3rd Baron Coleraine's ownership. An extra range of rooms was added to the north, and the pediment of the north front ornamented with a large coat of the Coleraine arms.[9]

Hare's marriage was not consummated, and following an affair with a French woman, Rosa du Plessis, du Plessis bore him his only child, a daughter named Henrietta Rosa Peregrina, born in France in 1745.[21] Hare died in 1749 leaving his estates to the four-year-old Henrietta, but her claim was rejected owing to her French nationality. After many years of legal challenges, the estates, including Bruce Castle, were granted to her husband James Townsend, whom she had married at age 18.[21]

James Townsend was a leading citizen of the day. He served as a magistrate, was Member of Parliament for West Looe, and in 1772 became Lord Mayor of London, whilst Henrietta was a prominent artist, many of whose engravings of 18th-century Tottenham survive in the Bruce Castle Museum.[21]

After 1764, under the ownership of James Townsend, the house was remodelled again. The narrow east front was remodelled into an entrance front, and given the appearance of a typical Georgian house, while the gabled attics on the south front were removed, giving the south facade the appearance it has

today.[9]

James and Henrietta Townsend's son, Henry Hare Townsend, showed little interest in the area or in the traditional role of the Lord of the Manor. After leasing the house to a succession of tenants, the house and grounds were sold in 1792 to Thomas Smith of Gray's Inn as a country residence.[21]

[edit] John Eardley Wilmot

John Eardley Wilmot (c. 1749 – 23 June 1815) was Member of Parliament for Tiverton (1776–1784) and Coventry (1784–1796), and in 1783 led the Parliamentary Commission investigating the events that had led to the American Revolution. He also led the processing of compensation claims, and the supply of basic housing and provisions, for the 60,000 Loyalist refugees who arrived in England in the aftermath of the independence of the United States.[11]

Following the beginning of the French Revolution in 1789, a second wave of refugees arrived in England. Although the British government on this occasion did not offer organised relief to refugees, Wilmot, in association with William Wilberforce, Edmund Burke and George Nugent-Temple-Grenville, 1st Marquess of Buckingham, founded "Wilmot's Committee", which raised funds to provide accommodation and food, and found employment for refugees from France, large numbers of whom settled in the Tottenham area.[11]

In 1804, Wilmot retired from public life and moved to Bruce Castle to write his memoirs of the American Revolution, and his role in the investigations of its causes and consequences. They were published shortly before his death in 1815.[11]

After Wilmot's death London merchant John Ede purchased the house and its grounds, and demolished the building's west wing.[11] It was never rebuilt, resulting in the current skewed shape of the building. In 1827, Ede sold the house and grounds to Worcestershire educationalist Rowland Hill, for use as a school.

[edit] The Hill School

Hill and his brothers had taken over the management of their father's school in Birmingham in 1819, which opened a branch at Bruce Castle in 1827, with Rowland Hill as Headmaster. The school was run along radical lines inspired by Hill's friends Thomas Paine, Richard Price and Joseph Priestley;[22] all teaching was on the principle that the role of the teacher is to instill the desire to learn, not to impart facts, corporal punishment was abolished and alleged transgressions were tried by a court of pupils, while the school taught a radical (for the time) curriculum including foreign languages, science and engineering.[23][24] Amongst other pupils, the school taught the sons of many London-based diplomats, particularly from the newly independent nations of South America, and the sons of computing pioneer Charles Babbage.[23]

In 1839 Rowland Hill, who had written an influential proposal on postal reform, was appointed as head of the General Post Office (where he introduced the world's first postage stamps), leaving the school in the hands of his younger brother Arthur Hill.[23] Arthur retired in 1868, leaving the school in the hands of his son Birkbeck Hill.

During the period of the School's operation, the character of the area had changed beyond recognition. Historically, Tottenham had consisted of four villages on Ermine Street (later the A10 road), surrounded by marshland and farmland.[25] The construction of the Northern and Eastern Railway in 1840, with stations at Tottenham Hale and Marsh Lane (later Northumberland Park), made commuting from Tottenham to central London feasible for the first time (albeit by a circuitous eight-mile route via Stratford, more than double the distance of the direct road route), as well as providing direct connections to the Port of London.[26] In 1872 the Great Eastern Railway opened a direct line from Enfield to Liverpool Street station,[27] including a station at Bruce Grove, close to Bruce Castle;[28] the railway provided subsidised workmen's fares to allow poor commuters to live in Tottenham and commute to work in central London.[29] As a major rail hub, Tottenham grew into a significant residential and industrial area; by the end of the 19th century, the only remaining undeveloped areas were the grounds of Bruce Castle itself, and the

waterlogged floodplains of the River Lea at Tottenham Marshes and of the River Moselle at Broadwater Farm.[25]

In 1877 Birkbeck Hill retired from the post of headmaster, ending his family's association with the school. The school closed in 1891, and Tottenham Council purchased the house and grounds. The grounds of the house were opened to the public as Bruce Castle Park in June 1892,[30] the first public park in Tottenham.[31] The house opened to the public as Bruce Castle Museum in 1906.[32][33]

[edit] Heraud's Tottenham

Bruce Castle was among the buildings mentioned in John Abraham Heraud's 1820 Spenserian epic, Tottenham, a romantic depiction of the life of Robert the Bruce:[34]

Lovely is moonlight to the poet's eye, That in a tide of beauty bathes the skies,
Filling the balmy air with purity,
Silent and lone, and on the greensward diesâ ~
But when on ye her heavenly slumber lies,
TOWERS OF BRUS! 'tis more than lovely then.â ~
For such sublime associations rise,
That to young fancy's visionary ken,
'Tis like a maniac's dream â ^ fitful and still again.[35]

[edit] Present day

Bruce Castle is now a museum, holding the archives of the London Borough of Haringey, and housing a permanent exhibition on the past, present and future of Haringey and its predecessor boroughs, and temporary displays on the history of the area.[31] Other exhibits include an exhibition on Rowland Hill and postal history,[34] a significant collection of early photography, a collection of historic manorial documents and court rolls related to the area,[36] and one of the few copies available for public reading of the Spurs Opus, the complete history of Tottenham Hotspur.[37] In 1949, the building was Grade I listed;[38] the round tower was separately Grade I listed at the same time,[39] and the 17th-century southern and western boundary walls of the park were Grade II listed in 1974.[40][41] In 1969 the castle became home to the regimental museum of the Middlesex Regiment [42] whose collection was subsequently transferred to the National Army Museum.[43]

In July 2006 a major community archaeological dig was organised in the grounds by the Museum of London Archaeological Archive and Research Centre, as part of the centenary celebrations of the opening of Bruce Castle Museum,[6] in which large numbers of local youths took part.[44][45] As well as large quantities of discarded everyday objects, the chalk foundations of what appears to be an earlier house on the site were discovered.[6]

[edit] Notes and references

^ Sources differ as to the date of construction; some date the current building to the 15th century, but most agree that the house dates from the 16th century, although there is no consensus as to the exact date.

^ As with most other English maps of the period, the map is aligned with south at the top (i.e. "upside down" when compared to modern maps). The alignment of streets in the area is preserved today; the road running east-west is the present-day Lordship Lane, and the road running north-south past the church is the present-day Church Lane; Bruce Grove does not yet exist, but its eventual route can be seen in the field boundaries running diagonally immediately south of the castle. The large field opposite the house (marked "Lease") is the northeast corner of the water-meadow which became Broadwater Farm. The fields to the east of Church Lane are the present Bruce Castle Park, while those to the west surrounding the church now form part of Tottenham Cemetery.

^ a b c d Pegram 1987, p. 2

^ a b c d Lysons, Daniel (1795), "Tottenham", The Environs of London (London) 3: 517â ^557, <http://www.british-history.ac.uk/report.aspx?compid=45450>,

retrieved 2 October 2008

^ a b c d e f Pegram 1987, p. 3

^ a b c d Bruce Castle Park community excavation, 2006, Museum of London, 2006, <http://www.museumoflondonarchaeology.org.uk/English/ComLearn/ComExcav/BruceCastle.htm>, retrieved 2 October 2008[dead link]

^ Bruce Castle, *The Mirror of Literature, Amusement, and Instruction*, Vol. 13, No. 350., (03-01-1829), accessed 27-01-2010

^ a b Robinson 1840, p. 216

^ a b c d e f g h i j Cherry and Pevsner 1998, p. 584

^ Cherry and Pevsner 1998, p. 11

^ a b c d e Pegram 1987, p. 9

^ Page, William (1911), "Ancient Earthworks", *A History of the County of Middlesex* 2: 14, <http://www.british-history.ac.uk/report.aspx?compid=22152>, retrieved 2 October 2008

^ An added inscription on this painting misidentifies the sitter as Edward Sackville, Richard's younger brother, later 4th Earl of Dorset. See Karen Hearn, ed. *Dynasties: Painting in Tudor and Jacobean England 1530-1630*. New York: Rizzoli, 1995. ISBN 0-8478-1940-X, pp. 198-199

^ Pegram 1987, p. 4

^ Clifford 1990, p. 83

^ a b c d e Pegram 1987, p. 5

^ a b Pegram 1987, p. 6

^ a b c Pegram 1987, p. 7

^ a b Underwood 1992, pp. 46-147

^ "The Ghostly Lady of Bruce Castle", *Tottenham & Edmonton Advertiser* (March 1858)

^ a b c d Pegram 1987, p. 8

^ Dick, Malcolm (2004) (65 KB DOC), *Joseph Priestley and his Influence on Education in Birmingham, Revolutionary Players of Industry and Innovation*, <http://www.search.revolutionaryplayers.org.uk/content/files/88/83/366.doc>, retrieved 16 March 2009

^ a b c Pegram 1987, p. 10

^ A printing press designed by Rowland Hill and built by pupils of the school is on display at London's Science Museum. At this time, school curricula were almost always restricted to the classics; for a school to include engineering in the curriculum was almost unique.

^ a b "Tottenham Growth after 1850", *A History of the County of Middlesex (Victoria County History)* 5: 317-324, 1976,

<http://www.british-history.ac.uk/report.asp?compid=26986>, retrieved 6 June 2007

^ Lake 1945, pp. 12-13

^ Lake 1945, p. 22

^ Connor 2004, § 54

^ Olsen 1976, p. 290

^ Cherry and Pevsner 1998, p. 57

^ a b Bruce Castle Museum, London Borough of Haringey,

<http://www.haringey.gov.uk/leisure/brucecastlemuseum.htm#about>, retrieved 2 October 2008

^ Pegram 1987, p. 11

^ Haringey, Museum of London,

<http://www.museumoflondon.org.uk/English/Collections/OnlineResources/X20L/Boroughs/haringey.htm>, retrieved 2 October 2008[dead link]

^ a b Haringey, Hidden London, <http://www.hidden-london.com/brucegrove.html>, retrieved 2 October 2008

^ Heraud, John Abraham (1820), *Tottenham: A Poem*,

<http://198.82.142.160/spenser/TextRecord.php?action=GET&textsid=39266>, retrieved 2 October 2008

^ New Bruce Castle document sheds light on Tottenham history, London Borough of Haringey, 31 August 2007,

http://www.haringey.gov.uk/index/news_and_events/latest_news/deed_tottenham.htm, retrieved 2 October 2008[dead link]

^ Fontaine, Valley (26 September 2008), Spurs well and truly books, Bruce Castle Museum, BBC News, http://www.bbc.co.uk/london/content/articles/2008/09/26/haringey_spurs_opus_feature.shtml, retrieved 2 October 2008
 ^ Images of England: Bruce Castle, English Heritage, <http://www.imagesofengland.org.uk/Details/Default.aspx?id=201424>, retrieved 23 March 2009
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 ^ Images of England: Southern boundary wall to Bruce Castle Park, English Heritage, <http://www.imagesofengland.org.uk/details/default.aspx?id=201422>, retrieved 8 April 2009
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[edit] External links

Coordinates: 51°35′25″N 0°04′23″W﻿ / ﻿51.59025°N 0.075354°W﻿ / 51.59025; -0.075354

"Nothing to My Name" (also known in English as "I Have Nothing") is the English title of a 1986 Mandarin-language rock song by Cui Jian. It is widely considered Cui's most famous and most important work, and one of the most influential songs in the history of the People's Republic of China, both as a seminal point in the development of Chinese rock and roll and as a political

sensation. The song was an unofficial anthem for Chinese youth and activists during the Tiananmen Square protests of 1989.

Both in its lyrics and instruments, the song mixes traditional Chinese styles with modern rock elements. In the lyrics, the speaker addresses a girl who is scorning him because he has nothing. However, the song has also been interpreted as being about the dispossessed youth of the time, because it evokes a sense of disillusionment and lack of individual freedom that was common among the young generation during the 1980s.

[edit] Historical context

By the late 1970s, Western rock music was gaining popularity in mainland China. After the Cultural Revolution ended in the mid-1970s and the government began a period of economic reform called *gaige kaifang*, many students and businessmen went abroad and brought back Western music. Chinese singers began performing covers of popular Western rock songs.[1]

At the same time, Chinese society and the Chinese government were quickly abandoning Maoism, and promoting economic policies that had a more capitalist orientation.[2] Many Chinese teens and students were becoming disillusioned with their government, which they felt had abandoned its ideals.[3] Because of the rapid economic changes, many of them felt that they had no opportunities and no individual freedom.[4] These developments formed the background against which "Nothing to My Name" appeared in 1986.

[edit] Music and lyrics

[edit] Musical style

Cui Jian was heavily influenced by Western artists such as Bob Dylan, The Beatles, The Rolling Stones, and Talking Heads;[5] in the late 1980s he even performed with a hair style modeled on that of John Lennon.[6] In "Nothing to My Name" and other songs, he intentionally altered the sounds of traditional Chinese musical instruments by mixing them with elements of rock music, such as electric guitar.[7] He also purposely divorced his musical style from that of the revolutionary songs and proletarian operas that were common under Chairman Mao Zedong during the Cultural Revolution—for example, he performed his music very loud, as high as 150 decibels, just because Mao had considered loud music disruptive to the social order.[8]

In genre, the song is often called the first work of *Xibeifeng*, a 1980s music style originating from Northwest China.[9] Cui himself, however, considers the song "pure" rock and roll.[10]

[edit] Lyrics and meaning

Throughout the song, the narrator addresses an unidentified girl, asking "When will you come with me", and lamenting the fact that she laughs at him for having nothing to his name.[11] He tells her he wants to give her his hopes and bring her freedom, that "the earth is turning under your feet" and "the waters of life are flowing free", yet she persists in scorning him.[11] He asks why she laughs at the pack he carries on his back, and he wonders why he keeps on going, with nothing to his name.[11] At last, he tells her that he has waited for a long time, and that this is his final plea: he wants to grab her by the hands, to "take you away with me".[11] As he sees her hands tremble, and her eyes "overflow with tears", he asks her, "Do you really mean to tell me, you love me as I am?"[11]

Interpretations of the song's meaning vary from one listener to the next; some people view it as a song about love and desire, while others understand it as a political metaphor, the lyrics being addressed as much to the Chinese nation as to a girlfriend.[12][13][14][15] University of Florida scholar Jonathan Matusitz describes the song's lyrics as a means of expressing politically sensitive ideas that could not be stated through any other medium.[16] In this interpretation, the lyrics near the beginning, "I've asked you without end / When will you go with me / But you always laughed at me / for having nothing to my name" ("æ `æ, ¾ç» é`@ä, ä¼`/ä¼ ä¼-æ`¶è·æ `èµ°/å ¯ä¼ å ´æ »æ""ç-`æ `ä, æ´ æ æ ") are to express the "humiliation and lack of individuality, possession, and personal freedom", [11] the "sense of loss and disorientation" among China's youth in the 1980s.[17] Ethnomusicologist Timothy Brace has described this common analysis

of the song lyrics as "recast[ing] the setting of this piece from that of a boy talking to his girlfriend to that of a youthful generation talking to the nation as a whole." The ambiguity is heightened by the structure of the phrase yǎo wú suǒ yǒu, an idiomatic chengyu. It literally means "to have nothing" and has no grammatical subject. Therefore, it can be interpreted as meaning "I have nothing" (implying that it is a song about two people), or "we have nothing" (understanding it as social commentary).[18][19]

The narrator of the song worries that the girl he is addressing will ignore him because he has nothing to give her; likewise, the song's audience in the 1980s—young students and workers—were also suffering from not having resources to marry, to be with their girlfriends and boyfriends, or to attract members of the opposite sex.[4] The lyrics also express Western concepts of individualism,[20] and were some of the first popular song lyrics in China to promote self-expression and self-empowerment. This put the song in stark contrast with older music, which had emphasized conformity and obedience.[3] As the narrator, later on in the song, confidently proclaims to the girl that he will "grab her hands" ("wǒ èrèr wǒ ài nǐ de shǒu") and then she will go with him ("nǐ èrèr wǒ ài nǐ de shǒu"), he suggests in the end that she can love the fact that he has nothing ("èrèr wǒ ài nǐ de shǒu" "wǒ ài nǐ de shǒu" "wǒ ài nǐ de shǒu"). On one level, this suggests that the song is about "love conquering all", [21] but the line has also been interpreted as threatening, and suggestive of an unorthodox and "Dionysian" mix of love and aggression.[22]

Just as Cui adapts traditional Chinese sounds and instruments to a new format, in "Nothing to My Name" he also reappropriates traditional Chinese lyrical tropes. The lines "The earth under your feet is moving / The water around your body is flowing" ("dì xià nǐ de jiǎo xià de dì fāng zài yí dòng / shuǐ wǒ men shēn biān de shuǐ zài liú dòng") are reminiscent of the use of natural imagery in classical Chinese poetry and music, but here are intended to evoke the events going on around the song's listeners, and to provoke them to rebel against the established order.[23]

[edit] Release and impact

Cui wrote "Nothing to My Name" himself[9] and first performed it on a televised music competition in May 1986, with his band ADO.[5][12][21] The song was an instant success, creating a "sensation" and turning Cui into a cult figure among urban youth.[24][25] It was one of the first examples of Chinese, as opposed to imported, rock and roll music to gain popularity in China.[20][26] The government-controlled People's Daily gave the song a positive review, despite its politically sensitive message.[27] The song was included on Cui's 1989 album Rock 'n' Roll on the New Long March, released by the China Tourism Sound and Video Publishing Company. (The version of the album released overseas was called Nothing to My Name.[28]) By 1989, it had become a "battle song"[5] or "anthem"[29] among the youth movement.[12][30]

Cui performed the song live at the Tiananmen Square protests of 1989.[5][31] The performances by Cui and other rock artists during the protests have been described as "a revolutionary few days that rocked a nation," and many protesters sang "Nothing to My Name" to give voice to their rebellion against the government, and their desire for personal freedom and self-expression.[3][32] Brace describes how, during Cui's Tiananmen performance, students "jumped to their feet and began to sing," a practice that had rarely happened at music performances in China before then.[33] Not long after Tiananmen, Cui was restricted to playing in small venues; he did not play before a large audience in mainland China again until 2005.[12]

Cui has become known as the "Father of Chinese Rock", [34] and "Nothing to My Name" has become his most famous song.[21][35] It has been described as "the biggest hit in Chinese history"[5][36] and the beginning of Chinese rock.[26]

^ Brace & Friedlander 1992, p. 119

^ Matusitz 2007, p. 6

^ a b c Matusitz 2007, pp. 11–12

^ a b Calhoun 1994, p. 95

^ a b c d e DeWoskin, Rachel. "Power of the Powerless". Words Without Borders.

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^ Matusitz 2007, p. 7

^ Matusitz 2007, p. 9

^ Matusitz 2007, p. 10

^ a b Brace 1992, p. 152

^ Brace 1992, p. 165

^ a b c d e f Matusitz 2007, p. 16

^ a b c d "Cui Jian: The man who rocks China". *The Independent*. 2005-11-14.

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^ Blum & Jensen 2002, p. 301

^ Calhoun 1994, p. 94

^ Matusitz 2007, p. 17

^ Matusitz 2007, p. 2

^ Blum & Jensen 2002, p. 297

^ Brace & Friedlander 1992, p. 121

^ Brace 1992, p. 154

^ a b Matusitz 2007, p. 4

^ a b c Clark, Matthew Corbin (2003-02-13). "Birth of a Beijing Music Scene".

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^ Chong 1991, p. 72

^ Matusitz 2007, pp. 17-18

^ Brace 1992, p. 164

^ Donald 2000, p. 107

^ a b Steen 2000. "China's rock music history began in 1986, when Cui Jian's now-famous song "Nothing to My Name" (Yi Wu Suo You) appeared in public for the first time."

^ Zhou 2008, p. 116

^ Chong 1991, p. 58

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^ Matusitz 2007, p. 1

^ Blum & Jensen 2002, p. 292

^ Chong 1991, p. 55

^ Brace & Friedlander 1992, p. 122

^ "a~a ¥è ä, i¼æ`ä æ³ç» ä½ ä, ç¹éç è²ç ç (Professor Cui Jian, I just want to give you a little something to look at)". ä»ä-|ç¾ä-|ç¾ä@¹ (Medical, Aesthetics, and Cosmetology) (7). 2006. <http://www.cqvip.com/qk/97994x/2005007/15816091.html>.

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^ Brace & Friedlander 1992, p. 120

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Grand Duchess Olga Alexandrovna of Russia (Russian: О.И. Д»Ñ Д³Д° Д¹Д»ДµД°Ñ Д°Ï Д¼Д´Ñ Д³Д²Д¼Д° Д Д³Д¼Д°Ï Д¼Д³Д²Д°; Olga Alexandrovna Romanova) (13 June [O.S. 1 June] 1882 ~ 24 November 1960) was the youngest child of Emperor Alexander III of Russia. Her older brother was Tsar Nicholas II.

She was raised at the Gatchina Palace outside Saint Petersburg. Olga's relationship with her mother, Empress Marie, the daughter of King Christian IX of Denmark, was strained and distant from childhood. In contrast, she and her father were close. He died when she was 12, and her brother Nicholas became emperor.

In 1901, she married Duke Peter Alexandrovich of Oldenburg, who was privately believed by family and friends to be homosexual. Their marriage of 15 years remained unconsummated, and Peter at first refused Olga's request for a divorce. The couple led separate lives and their marriage was eventually annulled by the Emperor in October 1916. The following month Olga married cavalry officer Nikolai Kulikovsky, with whom she had fallen in love several years before. During the First World War, the Grand Duchess served as an army nurse at the front and was awarded a medal for personal gallantry. At the downfall of the Romanovs in the Russian Revolution of 1917, she fled to the Crimea with her husband and children, where they lived under the threat of assassination. Her brother and his family were shot by revolutionaries.

Olga escaped revolutionary Russia with her second husband and their two sons in February 1920. They joined her mother, the Dowager Empress, in Denmark. In exile, Olga acted as companion and secretary to her mother, and was often sought out by Romanov impostors who claimed to be her dead relatives. She met Anna Anderson, the best-known impostor, in Berlin in 1925. After the Dowager Empress's death in 1928, Olga and her husband purchased a dairy farm in Ballerup, near Copenhagen. She led a simple life: raising her two sons, working on the farm and painting. During her lifetime, she painted over 2,000 works of art, which provided extra income for both her family and the charitable causes she supported.

In 1948, feeling threatened by Joseph Stalin's regime, Olga emigrated with her immediate family to a farm in Ontario, Canada. With advancing age, Olga and her husband moved to a bungalow near Cooksville, Ontario. Colonel Kulikovsky died there in 1958. Two years later, as her health deteriorated, Olga moved with devoted friends to a small apartment in East Toronto. She died aged 78, seven months after her older sister, Xenia. At the end of her life and afterwards, Olga was widely labeled the last Grand Duchess of Imperial Russia.

[edit] Early life

Olga was the youngest daughter of Tsar Alexander III and his consort, Marie Feodorovna, formerly Princess Dagmar of Denmark. She was born in the purple, i.e. during her father's reign, on 13 June 1882 in the Peterhof Palace, west of Saint Petersburg. Her birth was announced by a traditional 101-gun salute from the ramparts of the Peter and Paul Fortress, and similar salutes throughout the Russian Empire.[1] Her mother, advised by her sister, Alexandra, Princess of Wales, placed Olga in the care of an English nanny, Elizabeth Franklin.[1]

The Russian imperial family was a frequent target for assassins, so for safety reasons the Grand Duchess was raised at the country palace of Gatchina, about 50 miles (80 km) west of Saint Petersburg. Olga and her siblings, however, were not accustomed to a lavish early lifestyle. Conditions in the nursery were modest, even Spartan.[2] They slept on hard camp beds, rose at dawn, washed in cold water, and ate a simple porridge for breakfast.[2]

Olga left Gatchina for the first time in the early fall of 1888 when the imperial family visited the Caucasus. On 29 October, their return train approached the small town of Borki at speed. Olga's parents and their four older children were eating lunch in the dining-car when the train lurched violently and came off the rails. The carriage was torn open; the heavy iron roof caved in, and the wheels and floor of the car were sliced off. The Tsar crawled out from beneath the crushed roof, and held it up with "a Herculean effort" so that the others could escape.[3] There were 21 fatalities. Empress Marie helped tend the wounded, and made makeshift bandages from her own clothes.[4] An official investigation found that the crash was an accident,[5] but it was widely assumed that two bombs had been planted on the line.[4]

The Grand Duchess and her siblings were taught at home by private tutors. Subjects included history, geography, Russian, English and French, as well as drawing and dancing.[6] Physical activities such as equestrianism were taught at an early age, and they became expert riders.[7] The family was deeply religious. Although Christmas and Easter were times of celebration and extravagance, Lent was strictly observed—meat, dairy products and any form of entertainment were avoided.[8] Family holidays were taken in the summer at Peterhof and with Olga's grandparents in Denmark.[9]

Empress Marie was reserved and formal with Olga as a child, and their relationship remained a difficult one.[10] However, Olga, her father, and the youngest of her brothers, Michael, had a close relationship. Together, the three frequently went on hikes within the Gatchina forests, where the Tsar taught Olga and Michael woodsmanship.[11] Olga said of her father:

My father was everything to me. Immersed in work as he was, he always spared that daily half-hour. | once my father showed me a very old album full of most exciting pen and ink sketches of an imaginary city called Mopsopolis, inhabited by Mopses [pug dogs]. He showed it to me in secret, and I was thrilled to have him share his own childhood secrets with me.[12]

During 1894 Olga's father became increasingly ill, and the annual trip to Denmark was cancelled.[13] On 13 November 1894, he died at the age of 49. The emotional impact on Olga, aged only 12, was traumatic,[14] and her eldest brother, the new Tsar Nicholas II, was propelled into a role for which in Olga's later opinion he was ill-prepared.[15]

[edit] Court life

Olga was due to enter society in the summer of 1899, but after the death of her brother George at the age of 27, her first official public appearance was delayed by a year until 1900.[16] She hated the experience, and later told her official biographer Ian Vorres, "I felt as though I were an animal in a cage—exhibited to the public for the first time." [17] From 1901, Olga was appointed honorary Commander-in-Chief of the 12th Akhtyrsky Hussar Regiment of the Imperial Russian Army. The Akhtyrsky Hussars were famous for their victory over Napoleon Bonaparte at the Battle of Kulm in 1813, and wore a distinctive brown dolman.[18]

By 1900 Olga, age 18, was being escorted to the theatre and opera by a distant

cousin, Duke Peter Alexandrovich of Oldenburg, a member of the Russian branch of the House of Oldenburg.[19] He was 14 years her senior and known for his passion for literature and gambling.[20] Peter asked for Olga's hand in marriage the following year, a proposal that took the grand duchess completely by surprise: "I was so taken aback that all I could say was 'thank you'," she later explained. [21]

Their engagement, announced in May 1901, was unexpected by family and friends, as Peter had shown no prior interest in women,[17] and members of society assumed he was homosexual.[22] At the age of 19, on 9 August 1901, Olga married 33-year-old Peter. After the celebration the newlyweds left for the Oldenburg palace on the Field of Mars. Olga spent her wedding night alone in tears, while her husband left for a gambling club returning the next morning.[23] Their marriage remained unconsummated,[24] and Olga suspected that Peter was pushed into proposing by his ambitious mother.[25] Biographer Patricia Phenix thought Olga may have accepted his proposal to gain independence from her own mother, the Dowager Empress Marie, or avoid marriage into a foreign court.[26] The couple initially lived with her in laws Duke Alexander Petrovich of Oldenburg and Eug nie Maximilianovna of Leuchtenberg. It was not an harmonious arrangement as Peter's parents, both well known for their philanthropic work, berated their only son for his laziness.[23] Eug nie, a close friend of Empress Marie, showered her daughter-in-law with gifts including a ruby tiara that had been a present to Jos phine de Beauharnais from Napoleon, but Olga took a dislike towards her mother in law.[23] A few weeks after the wedding, Olga and her husband traveled to Biarritz, France, where they boarded a yacht loaned to them by King Edward VII of Great Britain and sailed to Sorrento, Italy.[27]

On their return to Russia, they settled into a 200-room palace (the former Baryatinsky mansion) at 46 Sergievskaya Street (today Tchaikovskogo Street), Saint Petersburg.[28] The palace, a gift from Tsar Nicholas II to his sister, now houses the Saint Petersburg Chamber of Commerce and Industry. The grand duchess had her own studio to draw, but in their large palace, Olga and Peter had separate bedrooms at opposite ends of the building.[29] Unhappy in her marriage, Olga fell into bouts of depression that caused her to lose her hair, forcing her to wear a wig. It took two years for her hair to regrow.[30]

Near the Oldenburg's estate, Ramon in Voronezh province, Olga had her own villa, called "Olgino" after the local town.[31] She subsidized the village school out of her own pocket, and established a hospital.[32] Her daughter-in-law later wrote, "She tried to help every needy person as far as her strengths and means would permit." [32] At the hospital, she learned basic medical treatment and proper care from the local doctor.[33] She exemplified her strong Orthodox faith by creating religious icons, which she distributed to the charitable endeavours she supported.[32] At Ramon Olga and Peter enjoyed walking through the nearby woods and hunted wolves together.[34] He was kind and considerate towards her, but she longed for love, a normal marriage and children.[35]

In April 1903, she was introduced to a Blue Cuirassier Guards officer Nikolai Kulikovsky by her brother Michael during a royal military review at Pavlovsk Palace.[36] Olga and Kulikovsky began to see each other, and exchanged letters regularly. The same year, at the age of 22, she confronted her husband and asked for a divorce, which he refused with the qualification that he might reconsider after seven years.[37] Nevertheless, Oldenburg appointed Kulikovsky as an aide-de-camp, and allowed him to live in the same residence as Oldenburg and the Grand Duchess on Sergievskaya street.[38] The relationship between Kulikovsky and the Grand Duchess was not public,[39] but gossip about their romance spread through society.[40]

From 1904 to 1906, Duke Peter was appointed to a military post in Tsarskoye Selo, a complex of palaces just south of Saint Petersburg. In Tsarskoye Selo, the Grand Duchess grew close to her brother Nicholas and his family, who lived at the Alexander Palace near her own residence.[41] Olga prized her connection to the Tsar's four daughters.[42] From 1906 to 1914, Olga took her nieces to parties and engagements in Saint Petersburg, without their parents, every

weekend throughout the winter.[42] She especially took a liking to the youngest of Nicholas's daughters, her god-daughter Anastasia, whom she called Shvipsik ("little one").[43] Through her brother and sister-in-law, Olga met Rasputin, a self-styled holy man who purported to have healing powers. Although she made no public criticisms of Rasputin's association with the imperial family, she was unconvinced of his supposed powers and privately disliked him.[44] As Olga grew close to her brother's family, her relationship with her other surviving brother, Michael, deteriorated. To her and Nicholas's horror, Michael eloped with his mistress, a twice-divorced commoner, and communication between Michael and the rest of the family was essentially cut off.[45]

Public unrest over the Russo-Japanese War and demands for political reform increased in the early years of the twentieth century. At Epiphany 1905, a band of revolutionaries fired live rounds at the Winter Palace from the Peter and Paul Fortress. Olga and the Dowager Empress were showered with glass splinters from a smashed window, but were unharmed.[46] Three weeks later, on "Bloody Sunday", at least 92 people were killed by Cossack troops during a demonstration,[47] and a month later Olga's uncle, Grand Duke Sergei Alexandrovich of Russia, was assassinated.[48] Uprisings occurred throughout the country, and parts of the navy mutinied.[49] Olga supported the appointment of the liberal Pyotr Stolypin as prime minister, and he embarked on a programme of gradual reform, but in 1911 he was assassinated.[50] The public unrest, Michael's elopement, and Olga's sham marriage placed her under strain, and in 1912, while visiting England with her mother, she suffered a nervous breakdown.[51] Tsarina Alexandra was also unwell with fatigue, concerned by the poor health of her hemophiliac son, Alexei.[52] Olga stood in for the Tsarina at public events, and accompanied her brother on a tour of the interior, while the Tsarina remained at home.[53]

[edit] War and revolution

On 1 August 1914, just before the start of World War I, Olga's regiment, the Akhtyrsky Hussars, appeared at an Imperial Review before her and the Tsar at Krasnoe Selo.[54] Kulikovsky volunteered for service with the Hussars, who were stationed on the frontlines in Southwestern Russia.[18] With the Grand Duchess's prior medical knowledge from the village of Olgino, she started work as a nurse at an under-staffed Red Cross hospital in Rovno, near to where her own regiment was stationed.[55] During the war, she came under heavy Austrian fire while attending the regiment at the front. Nurses rarely worked so close to the frontlines and consequently she was awarded the Order of St. George by General Mannerheim, who later became President of Finland.[18] As the Russians lost ground to the Central Powers, Olga's hospital was moved eastwards to Kiev,[56] and Michael returned to Russia from exile abroad.[57]

In 1916, Tsar Nicholas II officially annulled the marriage between Duke Peter Alexandrovich and the Grand Duchess, allowing her to marry Colonel Kulikovsky.[58] The service was performed on 16 November 1916 in the Kievo-Vasilievskaya Church on Triokhsviatitelskaya (Three Saints Street) in Kiev. The only guests were the Dowager Empress Marie, Olga's brother-in-law Grand Duke Alexander, four officers of the Akhtyrsky Regiment, and two of Olga's fellow nurses from the hospital in Kiev.[59]

During the war, internal tensions and economic deprivation in Russia continued to mount and revolutionary sympathies grew. After Tsar Nicholas II abdicated in early 1917, many members of the Romanov dynasty, including Nicholas and his immediate family, were detained under house arrest. In search of safety, the Dowager Empress, Grand Duke Alexander, and Grand Duchess Olga traveled to the Crimea by special train, where they were joined by Olga's sister Grand Duchess Xenia.[60] They lived at Alexander's estate, Ay-Todor, about 12 miles (19 km) from Yalta, where they were placed under house arrest by the local forces.[61] On 12 August 1917, her first child and son, Tikhon Nikolaevich was born during their virtual imprisonment. He was named after Tikhon of Zadonsk, the Saint venerated near the Grand Duchess's estate at Olgino.[18] Although Tikhon was the grandson of an emperor and the nephew of another, neither he nor his younger brother Guri received any title as his father was a commoner.

The Romanovs isolated in the Crimea knew little of the fate of the Tsar and his family. Nicholas, Alexandra, and their children, were originally held at their official residence, the Alexander Palace, but the Provisional government under Alexander Kerensky relocated them to Tobolsk, Siberia. In February 1918, most of the imperial family at Ay-Todor was moved to another estate at Djulber, where Grand Dukes Nicholas and Peter were already under house arrest. Olga and her husband were left at Ay-Todor. The entire Romanov family in the Crimea was condemned to death by the Yalta revolutionary council, but the executions were delayed by political rivalry between the Yalta and Sevastopol Soviets.[62] By March 1918, the Central Power of Germany had advanced on the Crimea, and the revolutionary guards were replaced by German ones.[63] In November 1918, the German forces were informed that their nation had lost the war, and they evacuated homewards. Allied forces took over the Crimean ports, in support of the loyalist White Army, which temporarily allowed the surviving members of the Romanov family time to escape abroad. The Dowager Empress Marie and, at her insistence, most of her family and friends were evacuated by the British warship HMS Marlborough. Nicholas II, however, had already been assassinated and the family assumed, correctly, that his wife and children had also been killed.[64] Unknown to her, Olga's childhood confidant and brother Michael, the emperor's supposed successor, had been assassinated near Perm on 13 June 1918.

Olga and her husband refused to leave Russia, and decided to move to the Caucasus, which the White Army had cleared of revolutionary Bolsheviks.[65] An imperial bodyguard, Timofei Yatchik, guided them to his hometown, the large Cossack village of Novominskaya. In a rented five-roomed farmhouse there, Olga gave birth to her second son, Guri Nikolaevich, on 23 April 1919.[66] He was named after a friend of hers, Guri Panayev, who was killed while serving in the Akhtyrsky Regiment during World War I. In November 1919, the family set out on what would be their last journey through Russia. Just ahead of revolutionary troops, they escaped to Novorossiysk, and took refuge in the residence of the Danish consul, Thomas Schytte, who informed them of the Dowager Empress's safe arrival in Denmark.[67] After a brief stay with the consul, the family were shipped to a refugee camp on the island of B           in the Dardanelles Strait near Istanbul, Turkey, where Olga, her husband and children shared three rooms with eleven other adults.[68] After two weeks, they were evacuated to Belgrade in the Kingdom of Serbs, Croats and Slovenes where she was visited by Regent Alexander Karageorgevich, later King Alexander I of Yugoslavia. Alexander offered the Grand Duchess and her family a permanent home, but Olga was summoned to Denmark by her mother.[67] On Good Friday 1920, Olga and her family arrived in Copenhagen. They lived with the Dowager Empress Marie, at first at the Amalienborg Palace and then at the royal estate of Hvid  re, where Olga acted as her mother's secretary and companion.[69] It was a difficult arrangement at times. The dowager empress insisted on having Olga at her beck and call. Never reconciled with the idea of her daughter's marriage to a commoner, Marie was cold towards Kulikovsky rarely allowing him in her presence.[70] At formal functions, Olga was expected to accompany her mother alone. The empress also found Olga's young sons too boisterous.[70]

[edit] Anna Anderson

In 1925, Olga and Colonel Kulikovsky traveled to Berlin to meet Anna Anderson, who claimed to be Olga's niece, Grand Duchess Anastasia Nikolaevna of Russia. Anderson had attempted suicide in Berlin in 1920, which Olga later called "probably the only indisputable fact in the whole story".[71] Anderson claimed that with the help of a man named Tchaikovsky she had escaped from revolutionary Russia via Bucharest, where she had given birth to his child. Olga thought the story "palpably false",[72] since Anderson made no attempt to approach Queen Marie of Romania, during her entire alleged time in Bucharest. Olga said:

If Mrs. Anderson had indeed been Anastasia, Queen Marie would have recognized her on the spot.   ... Marie would never have been shocked at anything, and a niece of mine would have known it.   ... There is not one tittle of genuine

evidence in the story. The woman keeps away from the one relative who would have been the first to recognize her, understand her desperate plight, and sympathize with her.[72]

Anderson stated she was in Berlin to inform Princess Irene of Prussia (sister of Tsarina Alexandra and cousin of Tsar Nicholas II) of her survival. Olga commented, "[Princess Irene] was one of the most straightlaced women in her generation. My niece would have known that her condition would have indeed have shocked [her]."[72]

Olga met Anderson, who was being treated for tuberculosis, at a nursing home. Of the visit Olga later said:

My beloved Anastasia was fifteen when I saw her for the last time in the summer of 1916. She would have been twenty-four in 1925. I thought Mrs. Anderson looked much older than that. Of course, one had to make allowances for a very long illness... All the same, my niece's features could not possibly have altered out of all recognition. The nose, the mouth, the eyes were all different.[73]... As soon as I sat down by that bed in the Mommsen Nursing Home, I knew I was looking at a stranger. I had left Denmark with something of a hope in my heart. I left Berlin with all hope extinguished.[74]

In addition, Olga said she was dismayed that Anderson spoke only German and showed no sign of knowing either English or Russian, while Anastasia spoke both those languages fluently and was ignorant of German.[75] Nevertheless, Olga remained sympathetic towards Anderson, perhaps because she thought that she was ill rather than deliberately deceitful.[76] Olga later explained:

... she did not strike me as an out-and-out impostor. Her brusqueness warred against it. A cunning impostor would have done all she could to ingratiate herself... But Mrs. Anderson's manner would have put anyone off. My own conviction is that it all started with some unscrupulous people who hoped they might lay their hands on at least a share of the fabulous and utterly non-existent Romanov fortune... I had a feeling she was 'briefed,' as it were, but far from perfectly. The mistakes she made could not all be attributed to lapses of memory. For instance, she had a scar on one of her fingers and she kept telling everybody that it had been crushed because of a footman shutting the door of a landau too quickly. And at once I remembered the real incident. It was Marie, her elder sister, who got her hand hurt rather badly, and it did not happen in a carriage but on board the imperial train. Obviously someone, having heard something of the incident, had passed a garbled version of it to Mrs. Anderson.[74]

Conceivably, Olga was initially either open to the possibility that Anderson was Anastasia or unable to make up her mind.[77] Anderson's biographer and supporter Peter Kurth claimed that Olga wrote to the Danish ambassador, Herluf Zahle, at the end of October 1925: "My feeling is that she is not the one she believes~but one can't say she is not as a fact".[78] However, within a month she had made up her mind. She wrote to a friend, "There is no resemblance, and she is undoubtedly not A."[79][80] Olga sent Anderson a scarf and five letters, which were used by Anderson's supporters to claim that Olga recognized Anderson as Anastasia.[81] Olga later said she sent the gift and letters "out of pity",[82] and called the claims "a complete fabrication".[82] When Olga refused to recognize Anderson as Anastasia publicly and published a statement denying any resemblance in a Danish newspaper,[83] Anderson's supporters, Harriet von Rathlef and Gleb Botkin, claimed that Olga was acting on instructions received from her sister Xenia by telegram, which Olga denied in private letters and sworn testimony.[84][85] She told her official biographer, "I never received any such telegram." [82] The supposed telegram was never produced by Anderson's supporters, and it has never been found among any of the papers relating to the case.[86] Xenia said,

[Anderson's supporters] told the most terrible lies about my sister and me ... I was supposed to have sent Olga a telegram saying, 'On no account recognize Anastasia.' That was a fantasy. I never sent any telegrams, or gave my sister any advice about her visit to Berlin. We were all apprehensive about the wisdom of her going, but only because we feared it would be used for propaganda purposes by the claimant's supporters. ... My sister Olga felt sorry for that poor woman. She was kind to her, and because of her kindness of heart, her opinions and motives have been misrepresented.[87]

[edit] Danish residency and exodus

The Dowager Empress died on 13 October 1928 at Hvidovre. Her estate was sold and Olga purchased Knudsminde, a farm in Ballerup about 15 miles (24 km) from Copenhagen, with her portion of the proceeds.[88] They kept horses, in which Colonel Kulikovsky was especially interested, along with Jersey cows, pigs, chickens, geese, dogs and cats.[89] For transport they had a small car and a sledge.[89] Tikhon and Guri (age thirteen and eleven, respectively when they moved to Knudsminde) grew up on the farm. Olga ran the household with the help of her elderly, faithful lady's maid Emilia Tenso ("Mimka"), who had come along with her from Russia. The grand duchess lived with simplicity working in the fields, doing household chores and painting.<refname=H58/>

Her farm-estate became a center for the Russian monarchist community in Denmark and many Russian emigrants visited.[90] She maintained a high level of correspondence with the Russian émigré community and former members of the Russian imperial army.[67] In the 1930s, the family took annual holidays at Sofiero Castle, Sweden, with Crown Prince Gustaf of Sweden and his wife, Louise.[91] Olga began to sell her own paintings of Russian and Danish scenes, with exhibition auctions in Copenhagen, London, Paris, and Berlin. Some of the proceeds were donated to the charities she supported.[67]

Neutral Denmark was invaded by Nazi Germany on 9 April 1940, and was occupied for the remainder of World War II. Food shortages, communication restrictions, and transportation closures followed. As Olga's sons, Tikhon and Guri, served as officers in the Danish Army, they were interned as prisoners of war, but their imprisonment in a Copenhagen hotel lasted less than two months.[92] Tikhon was imprisoned for a further month in 1943 after being arrested on charges of espionage.[93] Other Russian émigrés, keen to fight against the Soviets, enlisted in the German forces. Despite her sons' internment and her mother's Danish origins, Olga was implicated in her compatriots' collusion with German forces, as she continued to meet and extend help to Russian émigrés fighting against communism.[94] On 4 May 1945, German forces in Denmark surrendered to the British. When economic and social conditions for Russian exiles failed to improve, General Pyotr Krasnov wrote to the Grand Duchess, detailing the wretched conditions affecting Russian immigrants in Denmark.[95] She in turn asked Prince Axel of Denmark to help them, but her request was refused.[96]

The Soviet Union wrote to the Danish government accusing Olga and a Danish Catholic bishop of conspiracy against the Soviet government.[97] With the end of World War II, Soviet troops came close to the Danish border, and the surviving Romanovs in Denmark grew fearful of an assassination or kidnapping attempt.[98] Olga decided to move her family across the Atlantic to the relative safety of rural Canada.[99]

[edit] Emigration to Canada

In May 1948, the Kulikovskys traveled to London by Danish troopship. They were housed in a grace and favour apartment at Hampton Court Palace while arrangements were made for their journey to Canada as agricultural immigrants.[100] On 2 June 1948, Olga, Kulikovsky, Tikhon and his Danish-born wife Agnete, Guli and his Danish-born wife Ruth, Guli and Ruth's two children, Xenia and Leonid, and Olga's devoted companion and former maid Emilia Tenso ("Mimka") departed Liverpool on board the Empress of Canada.[101] After a rough crossing, the ship docked at Halifax, Nova Scotia.[102] The family proceeded to

Toronto, where they lived until they purchased a 200-acre (0.81 km²) farm in Halton County, Ontario, near Campbellville.[103]

By 1952, the farm had become a burden to Olga and her husband. They were both elderly; their sons had moved away; labor was hard to come by; the Colonel suffered increasing ill-health, and some of Olga's remaining jewelry was stolen.[104] The farm was sold, and Olga, her husband and her former maid, Mimka, moved to a smaller 5-room house at 2130 Camilla Road, Cooksville, Ontario, a suburb of Toronto now amalgamated into the city of Mississauga.[105] Mimka suffered a stroke that left her an invalid, and Olga nursed her until Mimka's death on 24 January 1954.[106]

Neighbors and visitors to the region, including foreign and royal dignitaries, took interest in Olga, and visited her small home, which was also a magnet for Romanov impostors whom Olga and her family considered a menace.[107] Welcome visitors included Princess Marina, Duchess of Kent, in 1954,[108] and Louis Mountbatten and his wife Edwina, in August 1959.[109] In June 1959, Queen Elizabeth II and Prince Philip visited Toronto and invited the Grand Duchess for lunch on board the Royal Yacht, Britannia.[110]

By 1958, Olga's husband was virtually paralyzed, and Olga sold some of her remaining jewelry in an attempt to raise funds.[111] Following her husband's death in 1958, she became increasingly infirm until hospitalized in April 1960 at Toronto General Hospital.[112] She was not informed[113] or was not aware[114] that her elder sister, Xenia, died in London that month. Unable to care for herself, Olga went to stay with Russian émigré friends, Konstantin and Sinaida Martemianoff, in an apartment above a beauty salon in Gerrard Street East, Toronto.[115] On 21 November 1960, she slipped into a coma, and she died on 24 November, at the age of 78.[116]

She was interred next to her husband in York Cemetery, Toronto, on 30 November 1960, after a funeral service at Christ the Saviour Cathedral, Toronto. Officers of the Akhtyrsky Hussars and the Blue Cuirassiers stood guard in the small Russian church, which overflowed with mourners.[117] Although she lived simply, bought cheap clothes, and did her own shopping and gardening, her estate was valued at more than 200,000 Canadian dollars (about 1.5 million Canadian dollars as of 2010[118]) and was mostly held as stock and bonds.[119] Her material possessions were appraised at 350 Canadian dollars in total, which biographer Patricia Phenix considered an underestimate.[120]

[edit] Legacy

Olga began drawing and painting at a young age. She told her official biographer Ian Vorres:

Even during my geography and arithmetic lessons, I was allowed to sit with a pencil in my hand. I could listen much better when I was drawing corn or wild flowers.[121]

She painted throughout her life, on paper, canvas and ceramic, and her output is estimated at over 2,000 pieces.[122] Her usual medium was scenery and landscape, but she also painted portraits and still lifes. Vorres wrote,

Her paintings, vivid and sensitive, are immersed in the subdued light of her beloved Russia. Besides her numerous landscapes and flower pictures that reveal her inherent love for nature, she often also dwells on scenes from simple daily life... executed with a sensitive eye for composition, expression and detail. Her work exudes peace, serenity and a spirit of love that mirror her own character, in total contrast to the suffering she experienced through most of her life.[122]

Her daughter-in-law wrote,

Being a deeply religious person, the Grand Duchess perceived the beauty of nature as being divinely inspired creation. Prayer and attending church provided her with the strength not only to overcome the new difficulties

befallen her, but also to continue with her drawing. These feelings of gratefulness to God pervaded not only the icons created by the Grand Duchess, but also her portraits and still life paintings.[95]

Her paintings were a profitable source of income.[123] According to her daughter-in-law, Olga preferred to exhibit in Denmark to avoid the commercialism of the North American market.[124] The Russian Relief Programme, which was founded by Tikhon and his third wife Olga in honour of the Grand Duchess,[125] exhibited a selection of her work at the residence of the Russian ambassador in Washington in 2001, in Moscow in 2002, in Ekaterinburg in 2004, in Saint Petersburg and Moscow in 2005, in Tyumen and Surgut in 2006, at the Tretyakov Gallery in Moscow and Saint Michael's Castle in Saint Petersburg in 2007,[126] and at Vladimir Arsenyev Museum in Vladivostok in 2013.[127] Pieces by Olga are included in the collections of Queen Elizabeth II, Prince Philip, Duke of Edinburgh, King Harald of Norway, and private collections in North America and Europe.[122]Ballerup Museum in Pederstrup, Denmark, has around 100 of her works.[128]

<http://trud-ost.ru/?p=173196>

[edit] Ancestry

[edit] Notes and sources

- ^ a b Vorres, p. 3
- ^ a b Phenix, pp. 8â ^10; Vorres, p. 4
- ^ Vorres, p. 11
- ^ a b Vorres, p. 12
- ^ Phenix, p. 20
- ^ Vorres, pp. 18â ^20
- ^ Phenix, pp. 12â ^13; Vorres, pp. 26â ^27
- ^ Vorres, p. 30
- ^ Phenix, pp. 11, 24; Vorres, pp. 33â ^41
- ^ Phenix, p. 8; Vorres, p. 25
- ^ Vorres, p. 24
- ^ Vorres, pp. 9â ^11
- ^ Vorres, pp. 48â ^52
- ^ Phenix, pp. 30â ^31; Vorres, pp. 54, 57
- ^ Vorres, p. 55
- ^ Phenix, p. 45; Vorres, pp. 72â ^74
- ^ a b Vorres, p. 74
- ^ a b c d Kulikovsky-Romanoff, p. 4
- ^ Belyakova, p. 86
- ^ Belyakova, p. 84
- ^ Vorres, p. 75
- ^ Phenix, p. 52
- ^ a b c Belyakova, p. 88
- ^ Olga said: "I shared his roof for nearly fifteen years, and never once we were husband and wife" (Vorres, p. 76); see also Massie, p. 171
- ^ Vorres, pp. 75, 78
- ^ Phenix, p. 46
- ^ Belyakova, p. 89
- ^ Vorres, p. 81
- ^ Belyakova, p. 89
- ^ Belyakova, p. 88
- ^ Vorres, pp. 78â ^79
- ^ a b c Kulikovsky-Romanoff, p. 3
- ^ Vorres, p. 79
- ^ Belyakova, p. 91
- ^ Belyakova, p. 89
- ^ Crawford and Crawford, p. 51; Phenix, p. 62; Vorres, pp. 94â ^95
- ^ Phenix, p. 63; Vorres, p. 95
- ^ Crawford and Crawford, p. 52; Phenix, p. 73; Vorres, pp. 94â ^95

^ Vorres, pp. 95â ^96
 ^ A Cuirassier's Memoirs by Vladimir Trubetskoy, quoted in Phenix, p. 73
 ^ Vorres, pp. 97â ^99, 101
 ^ a b Massie, p. 171; Vorres, pp. 102â ^103
 ^ Phenix, p. 144; Vorres, pp. 98â ^99
 ^ Phenix, pp. 73â ^83; Vorres, pp. 127â ^139
 ^ Phenix, pp. 85â ^88; Vorres, pp. 108â ^109
 ^ Phenix, p. 68; Vorres, p. 111
 ^ Phenix, p. 69; Vorres, p. 111
 ^ Phenix, p. 69; Vorres, p. 112
 ^ Vorres, p. 113
 ^ Vorres, pp. 117â ^119
 ^ Phenix, p. 89; Vorres, pp. 121â ^122
 ^ Vorres, p. 122
 ^ Vorres, p. 123
 ^ Vorres, p. 125
 ^ Phenix, pp. 91â ^92; Vorres, p. 141
 ^ Phenix, p. 93; Vorres, p. 143
 ^ Phenix, p. 101
 ^ Phenix, p. 103
 ^ Grand Duke Alexander's Memoirs, Once A Grand Duke, p. 273, quoted in Phenix, p. 104
 ^ Phenix, pp. 115â ^117; Vorres, pp. 149â ^150
 ^ Phenix, p. 118
 ^ Phenix, pp. 122â ^123; Vorres, pp. 155â ^156
 ^ Phenix, pp. 123â ^125; Vorres, pp. 156â ^157
 ^ e.g. Letter from King George V to Victoria, Marchioness of Milford Haven, 2 September 1918, quoted in Hough, p. 326
 ^ Phenix, p. 128; Vorres, p. 159
 ^ Phenix, p. 129
 ^ a b c d Kulikovsky-Romanoff, p. 5
 ^ Phenix, p. 132
 ^ Vorres, pp. 167â ^171
 ^ a b BeÃche, p. 116
 ^ Olga quoted in Vorres, p. 173
 ^ a b c Olga quoted in Vorres, p. 175
 ^ Olga quoted in Massie, p. 174 and Vorres, p. 174
 ^ a b Olga quoted in Vorres, p. 176
 ^ "My nieces knew no German at all. Mrs. Anderson did not seem to understand a word of Russian or English, the two languages all the four sisters had spoken since babyhood.": Olga quoted in Vorres, p. 174
 ^ Klier and Mingay, p. 156; Vorres, p. 176
 ^ Klier and Mingay, p. 102; Massie, p. 174; Phenix, p. 155
 ^ Letter from Olga to Herluf Zahle, 31 October 1925, quoted in Kurth, p. 119, but with a proviso that the original letter has never been seen
 ^ Letter from Olga to Colonel Anatoly Mordvinov, 4 December 1925, Oberlandesgericht Archive, Hamburg, quoted in Kurth, p. 120
 ^ Olga wrote in a letter to Tatiana Melnik, 30 October 1926, Botkin Archive, quoted in Kurth, p. 144; and a letter dated 13 September 1926 quoted in von Nidda, pp. 197â ^198: "However hard we tried to recognize this patient as my niece Tatiana or Anastasia, we all came away quite convinced of the reverse." In a letter from Olga to Princess Irene, 22 December 1926, quoted in von Nidda, p. 168, she wrote, "I had to go to Berlin last autumn to see the poor girl said to be our dear little niece. Well, there is no resemblance at all, and it is obviously not AnastasiaÂ ... It was pitiful to watch this poor creature trying to prove she was Anastasia. She showed her feet, a finger with a scar and other marks which she said were bound to be recognized at once. But it was Maria who had a crushed finger, and someone must have told her this. For four years this poor creature's head was stuffed with all these storiesÂ ... It has been claimed, however, that we all recognized her and were then given instructions

by Mama to deny that she was Anastasia. That is a complete lie. I believe this whole story is an attempt at blackmail."

^ Klier and Mingay, p. 102; Vorres, p. 177

^ a b c Olga quoted in Vorres, p. 177

^ National Tidende, 16 January 1926, quoted in Klier and Mingay, p. 102 and Phenix, p. 155

^ "I can swear to God that I did not receive before or during my visit to Berlin, either a telegram or a letter from my sister Xenia advising that I should not acknowledge the stranger.": Sworn testimony of Grand Duchess Olga, Staatsarchiv Hamburg, File 1991 74 0 297/57 Volume 7, pp. 1297â ^1315, quoted in Phenix, p. 238

^ "They state that we all recognized her and that we then received an order from Mama to say that she is not Anastasia. This is a great lie!": Letter from Olga to Princess Irene, quoted in Klier and Mingay, p. 149

^ Phenix, p. 238

^ Xenia to Michael Thornton, quoted in a letter from Thornton to Patricia Phenix, January 10, 1998, quoted in Phenix, pp. 237â ^238

^ Phenix, p. 168; Vorres, p. 185

^ a b Hall, p. 58

^ Phenix, p. 170

^ Vorres, p. 186

^ Phenix, p. 174

^ Phenix, p. 176

^ Phenix, p. 176; Vorres, p. 187

^ a b Kulikovsky-Romanoff, p. 6

^ Phenix, p. 178

^ Phenix, p. 179

^ Phenix, pp. 179â ^180; Vorres, pp. 187â ^188

^ Mr. J. S. P. Armstrong, Agent General for Ontario, quoted in Vorres, p. 191

^ Vorres, pp. 188, 190

^ Vorres, p. 193

^ Vorres, p. 196

^ Vorres, pp. 196â ^198

^ Vorres, pp. 207â ^208

^ Phenix, pp. 205â ^206; Vorres, p. 209

^ Phenix, p. 207; Vorres, p. 210

^ Vorres, pp. 200â ^205

^ Phenix, p. 214; Vorres, p. 211

^ Vorres, p. 221

^ Phenix, pp. 238â ^239; Vorres, p. 207

^ Vorres, p. 219

^ Phenix, pp. 240â ^242; Vorres, p. 224

^ Vorres, p. 225

^ Phenix, p. 242

^ Phenix, p. 243; Vorres, p. 226

^ Vorres, p. 227

^ Phenix, pp. 246â ^247; Vorres, pp. 228â ^230

^ CPI inflation calculator, Bank of Canada, retrieved 2 November 2010

^ Phenix, p. 249

^ Phenix, p. 250

^ Vorres, p. 26

^ a b c Vorres, Ian (2000) "After the Splendor... The Art of the Last Romanov Grand Duchess of Russia", Smithsonian Institution, retrieved 9 March 2010

^ Grand Duchess Olga, quoted in Kulikovsky-Romanoff, p. 7

^ Kulikovsky-Romanoff, p. 8

^ Phenix, p. 1

^ "Majestic Artist: 125th birth anniversary of Grand Duchess Olga Alexandrovna", Russian State Museum, retrieved 9 March 2010

^ Official website of the Primorye State United Museum named after Vladimir Arsenyev (in Russian)

^ Ballerup Museum, retrieved 9 March 2010

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[edit] External links

- 1st generation
- 2nd generation
- 3rd generation
- 4th generation
- Grand Duchess Anna Petrovna
- 5th generation
- 6th generation
- 7th generation
- 8th generation
- 9th generation
- 10th generation
- * title granted by Grand Duke Cyril Vladimirovich
- ** title granted by Grand Duke Vladimir Cyrillovich

The Alaska Mental Health Enabling Act of 1956 (Public Law 84-830) was an Act of Congress passed to improve mental health care in the United States territory of Alaska. It became the focus of a major political controversy[1] after opponents nicknamed it the "Siberia Bill" and denounced it as being part of a communist plot to hospitalize and brainwash Americans. Campaigners asserted that it was part of an international Jewish, Roman Catholic or psychiatric conspiracy intended to establish United Nations-run concentration camps in the United States.

The legislation in its original form was sponsored by the Democratic Party, but after it ran into opposition, it was rescued by the conservative Republican Senator Barry Goldwater. Under Goldwater's sponsorship, a version of the legislation without the commitment provisions that were the target of intense opposition from a variety of far-right, anti-Communist and fringe religious groups was passed by the United States Senate.[2] The controversy still plays a

prominent role in the Church of Scientology's account of its campaign against psychiatry.

The Act succeeded in its initial aim of establishing a mental health care system for Alaska, funded by income from lands allocated to a mental health trust. However, during the 1970s and early 1980s, Alaskan politicians systematically stripped the trust of its lands, transferring the most valuable land to private individuals and state agencies. The asset-stripping was eventually ruled to be illegal following several years of litigation, and a reconstituted mental health trust was established in the mid-1980s.

[edit] Background to the act

Alaska possessed no mental health treatment facilities prior to the passage of the 1956 Act. At the time of the Act's passage, Alaska was not a U.S. state, being constituted instead as a territory of the United States. The treatment of the mentally ill was governed by an agreement with the state of Oregon dating back to the turn of the 19th to 20th century. On June 6, 1900, the United States Congress enacted a law permitting the government of the then District of Alaska to provide mental health care for Alaskans. In 1904, a contract was signed with Morningside Hospital, privately owned and operated by Henry Waldo Coe in Portland, Oregon, under which Alaskan mental patients would be sent to the hospital for treatment.[3] A commitment regime was established under which a person said to be mentally ill was to be brought before a jury of six people, who would rule him sane or insane. The patient was routinely sent to prison until his release or transfer to Portland; at no point in this ruling was a medical or psychiatric examination required.[4]

By the 1940s it was recognized that this arrangement was unsatisfactory. The American Medical Association conducted a series of studies in 1948, followed by a Department of the Interior study in 1950. They highlighted the deficiencies of the program: commitment procedures in Alaska were archaic, and the long trip to Portland had a negative effect on patients and their families. In addition, an audit of the hospital contract found that the Sanatorium Company, which owned the hospital, had been padding its expenses. This had enabled it to make an excess profit of \$69,000 per year (equivalent to over \$588,000 per year at 2007 prices).[3]

The studies recommended a comprehensive overhaul of the system, with the development of an in-state mental health program for Alaska. This proposal was widely supported by the public and politicians. At the start of 1956, in the second session of the 84th Congress, Representative Edith Green (D-Oregon) introduced the Alaska Mental Health Bill (H.R. 6376) in the House of Representatives. The bill had been written by Bob Bartlett, the Congressional Delegate from the Alaska Territory who later became a U.S. Senator.[2] Senator Richard L. Neuberger (D-Oregon) sponsored an equivalent bill, S. 2518, in the Senate.

[edit] Details of the bill

The Alaska Mental Health Bill's stated purpose was to "transfer from the Federal Government to the Territory of Alaska basic responsibility for the hospitalization, care and treatment of the mentally ill of Alaska." In connection with this goal, it aimed:

to modernize procedures for such hospitalization (including commitment), care, and treatment and to authorize the Territory to modify or supersede such procedures;

to assist in providing for the Territory necessary facilities for a comprehensive mental-health program in Alaska, including inpatient and outpatient facilities;

to provide for a land grant to the Territory to assist in placing the program on a firm long-term basis; and

to provide for a ten-year program, of grants-in-aid to the Territory to enable the Territory gradually to assume the full operating costs of the program.[5]

The bill provided for a cash grant of \$12.5 million (about \$94 million at 2007 prices) to be disbursed to the Alaskan government in a number of phases, to fund the construction of mental health facilities in the territory. To meet

the ongoing costs of the program, the bill transferred one million acres (4,000 km²) of federally-owned land in Alaska to the ownership of the proposed new Alaska Mental Health Trust as a grant-in-aid ~the federal government owned about 99% of the land of Alaska at the time. The trust would then be able to use the assets of the transferred land (principally mineral and forestry rights) to obtain an ongoing revenue stream to fund the Alaskan mental health program. Similar provisions had applied in other US territories to support the provision of public facilities prior to the achievement of statehood.[4]

In addition, the bill granted the Governor of Alaska authority to enter into reciprocal mental health treatment agreements with the governors of other states. Alaskans who became mentally ill in the lower 48 states would be properly treated locally until they could be returned to Alaska; likewise, citizens of the lower 48 who fell mentally ill in Alaska would receive care there, before being returned to their home states.[4]

The bill was seen as entirely innocuous when it was introduced on January 16, 1956. It enjoyed bipartisan support, and on January 18 it was passed unanimously by the House of Representatives. It then fell to the Senate to consider the equivalent bill in the upper chamber, S. 2518, which was expected to have an equally untroubled passage following hearings scheduled to begin on February 20.[4]

[edit] Controversy

[edit] Sounding the alarm

In December 1955, a small anti-communist women's group in southern California, the American Public Relations Forum (APRF), issued an urgent call to arms in its monthly bulletin. It highlighted the proposed text of the Alaska Mental Health Bill, calling it "one that tops all of them". The bulletin writers commented: "We could not help remembering that Siberia is very near Alaska and since it is obvious no one needs such a large land grant, we were wondering if it could be an American Siberia." They said that the bill "takes away all of the rights of the American citizen to ask for a jury trial and protect him[self] from being railroaded to an asylum by a greedy relative or 'friend' or, as the Alaska bill states, 'an interested party'." [2]

The APRF had a history of opposing mental health legislation; earlier in 1955, it had played a key role in stalling the passage of three mental health bills in the California Assembly. It was part of a wider network of far-right organizations which opposed psychiatry and psychology as being pro-communist, anti-American, anti-Christian and pro-Jewish.[2] The Keep America Committee, another Californian "superpatriot" group, summed up the anti-mental health mood on the far right in a pamphlet issued in May 1955. Calling "mental hygiene" part of the "unholy three" of the "Communitistic World Government", it declared: "Mental Hygiene is a subtle and diabolical plan of the enemy to transform a free and intelligent people into a cringing horde of zombies".[6]

The APRF's membership overlapped with that of the much larger Minute Women of the U.S.A., a nationwide organization of militant anti-communist housewives which claimed up to 50,000 members across the United States. In mid-January 1956, Minute Woman Leigh F. Burkeland of Van Nuys, California issued a bulletin protesting against the bill. It was mimeographed by the California State Chapter of the Minute Women and mailed across the nation. On January 24, 1956, the strongly anti-Statist Santa Ana Register newspaper reprinted Burkeland's statement under the headline, "Now ~ Siberia, U.S.A." Burkeland issued a lurid warning of what the future might hold if the Alaska Mental Health Bill was passed by the Senate:

Is it the purpose of H.R. 6376 to establish a concentration camp for political prisoners under the guise of treatment of mental cases? The answer, based on a study of the bill, indicates that it is entirely within the realm of possibility that we may be establishing in Alaska our own version of the Siberia slave camps run by the Russian government. ~ | This legislation, say its opponents, will place every resident of the United States at the mercy of the whims and fancies of any person with whom they might have a disagreement,

causing a charge of 'mental illness' to be placed against them, with immediate deportation to SIBERIA, U.S.A! [7]

[edit] Fanning the flames

After the Santa Ana Register published its article, a nationwide network of activists began a vociferous campaign to torpedo the Alaska Mental Health Bill. The campaigners included, among other groups and individuals, the white supremacist Rev. Gerald L. K. Smith; Women for God and Country; the For America League; the Minute Women of the U.S.A.; the right-wing agitator Dan Smoot; the anti-Catholic former US Army Brigadier General Herbert C. Holdridge; and L. Ron Hubbard's Church of Scientology, which had been founded only two years earlier.

Increasingly strong statements were made by the bill's opponents through the course of the spring and summer of 1956. In his February 17 bulletin, Dan Smoot told his subscribers: "I do not doubt that the Alaska Mental Health Act was written by sincere, well-intentioned men. Nonetheless, it fits into a sinister pattern which has been forming ever since the United Nations was organized." [8] Dr. George A. Snyder of Hollywood sent a letter to all members of Congress in which he demanded an investigation of the Alaska Mental Health Bill's proponents for "elements of treason against the American people behind the front of the mental health program." The Keep America Committee of Los Angeles similarly called the proponents of the bill a "conspiratorial gang" that ought to be "investigated, impeached, or at least removed from office" for treason. [2] Retired brigadier general Herbert C. Holdridge sent a public letter to President Dwight Eisenhower on March 12, in which he called the bill "a dastardly attempt to establish a concentration camp in the Alaskan wastes." He went on:

This bill establishes a weapon of violence against our citizenry far more wicked than anything ever known in recorded history â ~ far worse than the Siberian prison camps of the Czars or the Communists, or the violence of the Spanish Inquisition â | The plot of wickedness revealed in this bill fairly reeks of the evil odor of the black forces of the Jesuits who dominate the Vatican, and, through officiates in our Government, dominate our politics. [3]

For their part, America's professional health associations (notably the American Medical Association and American Psychiatric Association) came out in favour of the bill. There was some initial opposition from the Association of American Physicians and Surgeons, a small and extremely conservative body which opposed socialized medicine; Dr. L. S. Sprague of Tucson, Arizona said in its March 1956 newsletter that the bill widened the definition of mental health to cover "everything from falling hair to ingrown toenails." However, the association modified its position after it became clear that the AMA took the opposite view. [3]

By March 1956, it was being said in Washington, D.C. that the amount of correspondence on the bill exceeded anything seen since the previous high-water mark of public controversy, the Lend-Lease Act of 1941. [2] Numerous letter-writers protested to their Congressional representatives that the bill was "anti-religious" or that the land to be transferred to the Alaska Mental Health Trust would be fenced off and used as a concentration camp for the political enemies of various state governors. [9] The well-known broadcaster Fulton Lewis described how he had "received, literally, hundreds of letters protesting bitterly against the bill. I have had telephone calls to the same effect from California, Texas and other parts of the country. Members of Congress report identical reactions." [10] A letter printed in the Daily Oklahoman newspaper in May 1956 summed up many of the arguments made by opponents of the bill:

The advocates of world government, who regard patriotism as the symptom of a diseased mind, took a step closer to their goal of compulsory asylum 'cure' for opponents of UNESCO, when, on January 18, the U.S. House of Representatives

passed the Alaska Mental Health Act.

The Act was prepared by the U.S. Department of Justice, Department of the Interior and the socialist-oriented Department of Health, Education and Welfare. It closely follows the Model Code, drafted by the American Psychiatric association, which has been working with the World Health Organization, a specialized agency of the United Nations â |
All of you who don't want members of your family railroaded to an asylum had better start writing your senator, now.[11]

During February and March 1956, hearings were held before the Senate Subcommittee on Territories and Insular Affairs. Proponents and opponents of the bill faced off in a series of tense exchanges, with strong accusations being made against the people and groups involved in the bill's introduction. Stephanie Williams of the American Public Relations Forum said that the bill would enable Russia to reclaim its former Alaskan territory: "[it] contains nothing to prevent Russia from buying the entire million acres â ~ they already say Alaska belongs to them." [12]

Mrs. Ernest W. Howard of the Women's Patriotic Committee on National Defense castigated the slackness of Congress for not picking up on the bill's perceived dangers: "Those of us who have been in the study and research work of the United Nations, we feel that we are experts in this . . . you as Senators with all the many commitments and the many requirements, are not able to go into all these things." John Kaspar, a White Citizens' Council organizer who had achieved notoriety for starting a race riot in Clinton, Tennessee, declared that "almost one hundred percent of all psychiatric therapy is Jewish and about eighty percent of psychiatrists are Jewish . . . one particular race is administering this particular thing." He argued that Jews were nationalists of another country who were attempting to "usurp American nationality." [4][6]

[edit] Passing the bill

The arguments of the bill's opponents attracted little support in the Senate. The Eisenhower administration, the Alaska territorial government and mainstream religious groups were all in favor of the bill. The Alaska Presbyterian Church gave the bill its unanimous support, issuing a statement declaring: "As Christian citizens of Alaska we believe this is a progressive measure for the care and treatment of the mentally ill of Alaska. We deplore the present antiquated methods of handling our mentally ill." It also urged the National Council of Churches to mobilize support for the bill.[13] An overwhelming majority of senators of both parties were also supportive. The bill's original author, Alaska Delegate Bob Bartlett, spoke for many of the bill's proponents when he expressed his bafflement at the response that it had received:

I am completely at a loss in attempting to fathom the reasons why certain individuals and certain groups have now started a letter-writing campaign â | to defeat the act. I am sure that if the letter writers would consult the facts, they would join with all others not only in hoping this act would become law but in working for its speedy passage and approval.[2]

Other senators expressed similar mystification at the agitation against the bill. Senator Henry M. Jackson of Washington stated that he was "at a loss" to see how the bill affected religion, as its opponents said.[9] Senator Alan Bible of Nevada, the acting chairman of the Subcommittee on Territories and Insular Affairs, told the bill's opponents that nothing in the proposed legislation would permit the removal of any non-Alaskan to the territory for confinement.[12]

Republican Senator Barry Goldwater of Arizona proposed an amended bill that removed the commitment procedures in title I of the House bill and stated that "Nothing in this title shall be construed to authorize the transfer to Alaska, pursuant to any agreement or otherwise, of any mentally ill person who is not a resident of Alaska." In effect, this eliminated the bill's most controversial elementâ ~the provision for the transfer of mental patients from the lower 48

states to Alaska.[4] The final recommendation of the Senate Committee on Interior and Insular Affairs followed Goldwater's lead that the bill be amended to strike all the controversial "detailed provisions for commitment, hospitalization, and care of the mentally ill of Alaska" included in title I of the original House bill. This amended proposal left only the transfer of responsibility for mental health care to the territory of Alaska and the establishment of land grants to support this care. The committee stressed that they were not invalidating the title I provisions of the original bill but that they had been misunderstood, a recurrent theme in supporters of the bill:

However, the proposed provisions were misunderstood by many persons in parts of the country other than Alaska. Partly as a result of this misunderstanding, but more because the members of the committee are convinced that the people of Alaska are fully capable of drafting their own laws for a mental health program for Alaska, the committee concluded that authority should be vested in them in this field comparable to that of the States and other Territories.[14]

Thus amended, the Senate bill (S. 2973) was passed unanimously by the Senate on July 20, after only ten minutes of debate.[2][3]

[edit] Aftermath

Following the passage of the act, an Alaska Mental Health Trust was set up to administer the land and grants appropriated to fund the Alaskan mental health program. During the 1970s, the issue of the trust's land became increasingly controversial, with the state coming under increasing pressure to develop the land for private and recreational use. In 1978, the Alaska Legislature passed a law to abolish the trust and transfer the most valuable parcels of lands to private individuals and the government.[15] By 1982, 40,000 acres (160Â km²) had been conveyed to municipalities, 50,000 acres (200Â km²) transferred to individuals, and slightly over 350,000 acres (1,400Â km²) designated as forests, parks or wildlife areas. Around 35 percent of the land trust remained unencumbered and in state ownership.[16]

The loss of the land and the revenue earned from it had a severe effect on mental health care in the state.[citation needed] In 1982, Alaska resident Vern Weiss filed a lawsuit on behalf of his son, who required mental health services that were not available in Alaska. The case of Weiss v State of Alaska eventually became a class action lawsuit involving a range of mental health care groups. The Alaska Supreme Court ruled in 1985 that the abolition of the trust had been illegal and ordered it to be reconstituted. However, as much of the original land had been transferred away, the parties had to undergo a long and complex series of negotiations to resolve the situation. A final settlement was reached in 1994 in which the trust was reconstituted with 500,000 acres (2,000Â km²) of original trust land, 500,000 acres (2,000Â km²) of replacement land, and \$200 million to replace lost income and assets.[16]

[edit] Scientology and the Alaska Mental Health Bill

The Alaska Mental Health Bill plays a major part in the Church of Scientology's account of its campaign against psychiatry. The Church participated in the campaign against the Bill and still refers to it as the "Siberia Bill". Scientology may also have provided an important piece of the "evidence" which the anti-bill campaigners used â ~ a booklet titled Brain-Washing: A Synthesis of the Russian Textbook on Psychopolitics, which has been widely attributed to the anonymous authorship of L. Ron Hubbard (see Brainwashing Manual).

[edit] Scientology position

The church's official website asserts that the bill was "psychiatry's attempt to establish a million-acre (4,000 km²) Siberia-type camp for mental health patients in Alaska, far from the prying eyes of civil libertarians"[17] which "presumably ... was far enough away from the well-traveled roads of the world to allow psychiatrists to conduct their mind control and other experiments on a captive population, unhindered by the glare of publicity." [18] It would give psychiatrists the power to ensure that "Any man, woman or child could be seized

and sent without trial to Alaska, deprived of human and civil rights and detained forever, all without trial or examination." [19] According to the Church's Freedom Magazine:

the bill came to the attention of Scientologists in 1956, only two years after the Church of Scientology had been established. â | Scientologists responded with a campaign to inform the public of the very real threat to personal liberties and freedom of speech posed by the measure. If passed, it would have created a potential "gulag" where political undesirables could be dumped and simply forgotten. The hope of creating this psychiatric slave state was shattered by Scientologists. Refusing to allow vested interests to destroy the right of every citizen to freely speak his opinions without fear of retaliation they instituted a huge grassroots letter campaign. This alerted the Senate to public opposition and testimony was presented at Senate Committee hearings on the bill. Ultimately, except for granting a small amount of money for Alaska to continue "treating" its few existing mental patients, the Senate rejected the Siberia bill and it was never heard of again. [20]

Church officials have stated their belief that the American Psychiatric Association intensified its "interest in destroying Dianetics and Scientology organizations ... when the Church of Scientology actively opposed a bill whose introduction in Congress had been secure by the APA. ... The APA was well aware of who was behind the massive response that defeated the legislation, and they never forgot, as can be seen from some of the attacks its members generated." [21]

[edit] Miscavige on Nightline

Similarly, David Miscavige, the church's leader, in 1992 told Ted Koppel in an interview on the Nightline program:

I don't know if you're aware that there was a plan in 1955 in this country, Ted, to repeat what was done in Russia. There was going to be a Siberia, U.S.A. set up on a million acres (4,000 km²) in Alaska to send mental patients. They were going to lessen the commitment laws, you could basically get into an argument with somebody and be sent up there. This sounds very odd. Nobody's ever heard about it. That's in no small part thanks to the Church of Scientology. I must say, though, that when that bill was killed in Congress, the war was on with psychiatry where they declared war on us â | It was a major, major, major flap for the psychiatrists when it got voted down, because then the slogan around the country began, 'Siberia U.S.A.,' and it was really the first time that psychiatry had been denigrated publicly, that they weren't the science that they had been promoting themselves to be. And they took it upon themselves then to start dealing with anybody who would oppose them. [22]

[edit] Conspiracy theories

In Ron's Journal 67, Hubbard identified "the people behind the Siberia Bill", who he asserted were

less than twelve men. They are members of the Bank of England and other higher financial circles. They own and control newspaper chains, and they are, oddly enough, directors in all the mental health groups in the world which have sprung up. Now these chaps are very interesting fellows: They have fantastically corrupt backgrounds; illegitimate children; government graft; a very unsavory lot. And they apparently, sometime in the rather distant past, had determined on a course of action. Being in control of most of the gold supplies of the planet, they entered upon a program of bringing every government to bankruptcy and under their thumb, so that no government would be able to act politically without their permission. [23]

According to David Miscavige, the bill was the product of a conspiracy by the American Psychiatric Association. In a public address in 1995, he told Scientologists that it was "in 1955 that the agents for the American Psychiatric Association met on Capitol Hill to ram home the infamous Siberia

Bill, calling for a secret concentration camp in the wastes of Alaska." It was "here that Mr. Hubbard, as the leader of a new and dynamic religious movement, knocked that Siberia Bill right out of the ring â ~ inflicting a blow they would never forget." [24] The assertion that Scientologists defeated the bill is made frequently in Scientology literature.[25] In fact, the original version of the bill with the offending Title I commitment provisions only passed the House of Representatives; it was subsequently amended in conference to strike the commitment portion and retain the transfer of responsibility for mental health care. The revised bill passed easily without further changes.[14]

[edit] Contemporary publications

Contemporary Church publications suggest that although Hubbard was tracking progress of the bill at least as early as February 1956, Scientology did not become involved in the controversy until the start of March 1956, over two months after the American Public Relations Forum had first publicized the bill. A March "Professional Auditor's Bulletin" issued by Hubbard, who was staying in Dublin at the time, includes a telegram from his Washington-based son L. Ron Hubbard, Jr. and two other Scientologists alerting him to the upcoming February Senate hearings:

HOUSE BILL 6376 PASSED JANUARY 18TH STOP GOES SENATE NEXT WEEK STOP BILL PERMITS ADMISSION OF PERSON TO MENTAL INSTITUTION BY WRITTEN APPLICATION OF INTERESTED PERSON BEFORE JUDICIAL PROCEEDINGS ARE HELD STOP DISPENSES WITH REQUIREMENT THAT PATIENT BE PRESENT AT HEARING STOP ANYONE CAN BE EXCLUDED FROM HEARING STOP BILL PERTAINS TO ALASKA AT MOMENT STOP BILL SETS UP ONE MILLION ACRES SIBERIAL [sic] IN ALASKA FOR INSTITUTIONS STOP LETTER AND BILL FOLLOW STOP WHAT ACTION YOU WANT TAKEN.[26]

Although the church says that Scientologists led the opposition to the bill, the Congressional Record's account of the Senate hearings into the bill does not mention the church. A contemporary review of the opposition to the bill likewise attributes the lead role elsewhere and to right-wing groups, rather than the "civil liberties" organizations cited by the church:

Only a few organized groups got behind the hue and cry. Most influential was the libertarian Association of Physicians and Surgeons, and Dan Smoot's newsletter. Right-wing groups bombarded Congress with protests and demands for hearings.[27]

[edit] See also

[edit] References

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^ a b c d e Boyvey, Roger. "Mental Health and the Ultra-Concerned", Social Service Review, 38:3 (1964:Sept.) p. 281-293.

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^ Alaska Mental Health Bill, H.R. 6376, January 16, 1958.

^ a b Marmor, Judd. "Psychodynamics of Group Opposition to Mental Health Programs", in Psychiatry in Transition. Butterworth, 1974.

^ "Now â ~ Siberia, U.S.A.", Santa Ana Register (California), January 24, 1956.

^ Benjamin R. Epstein, Arnold Forster, Danger on the Right, p. 141. Random House, 1964.

A supernova (abbreviated SN, plural SNe after supernovae) is a stellar explosion that is more energetic than a nova. It is pronounced *pron.: /ˈsʊˌɛpᵊ rᵊ noˑ vᵊ /* with the plural supernovae */ˈsʊˌɛpᵊ rᵊ noˑ viˑ ɛ₁/* or supernovas. Supernovae are extremely luminous and cause a burst of radiation that often briefly outshines an entire galaxy, before fading from view over several weeks

or months. During this short interval a supernova can radiate as much energy as the Sun is expected to emit over its entire life span.[1] The explosion expels much or all of a star's material[2] at a velocity of up to 30,000 km/s (10% of the speed of light), driving a shock wave[3] into the surrounding interstellar medium. This shock wave sweeps up an expanding shell of gas and dust called a supernova remnant.

Nova means "new" in Latin, referring to what appears to be a very bright new star shining in the celestial sphere; the prefix "super-" distinguishes supernovae from ordinary novae which are far less luminous. The word supernova was coined by Walter Baade and Fritz Zwicky in 1931.[4] Supernovae can be triggered in one of two ways: by the sudden reignition of nuclear fusion in a degenerate star; or by the collapse of the core of a massive star. The core of an aging massive star may undergo sudden gravitational collapse, releasing gravitational potential energy that can create a supernova explosion. Alternatively a white dwarf star may accumulate sufficient material from a stellar companion (either through accretion or via a merger) to raise its core temperature enough to ignite carbon fusion, at which point it undergoes runaway nuclear fusion, completely disrupting it.

Although no supernova has been observed in the Milky Way since SN 1604, supernovae remnants indicate that on average the event occurs about three times every century in the Milky Way.[5] They play a significant role in enriching the interstellar medium with higher mass elements.[6] Furthermore, the expanding shock waves from supernova explosions can trigger the formation of new stars.[7][8][9]

[edit] Observation history

Hipparchus' interest in the fixed stars may have been inspired by the observation of a supernova (according to Pliny).[10] The earliest recorded supernova, SN 185, was viewed by Chinese astronomers in 185 AD. The brightest recorded supernova was the SN 1006, which was described in detail by Chinese and Islamic astronomers.[11] The widely observed supernova SN 1054 produced the Crab Nebula. Supernovae SN 1572 and SN 1604, the latest to be observed with the naked eye in the Milky Way galaxy, had notable effects on the development of astronomy in Europe because they were used to argue against the Aristotelian idea that the universe beyond the Moon and planets was immutable.[12] Johannes Kepler began observing SN 1604 on October 17, 1604.[13] It was the second supernova to be observed in a generation (after SN 1572 seen by Tycho Brahe in Cassiopeia).[10]

Since the development of the telescope, the field of supernova discovery has extended to other galaxies, starting with the 1885 observation of supernova S Andromedae in the Andromeda galaxy. Supernovae provide important information on cosmological distances.[14] During the twentieth century, successful models for each type of supernova were developed, and scientists' comprehension of the role of supernovae in the star formation process is growing[update]. American astronomers Rudolph Minkowski and Fritz Zwicky developed the modern supernova classification scheme beginning in 1941.[15]

In the 1960s, astronomers found that the maximum intensities of supernova explosions could be used as standard candles, hence indicators of astronomical distances.[16] Some of the most distant supernovae recently observed appeared dimmer than expected. This supports the view that the expansion of the universe is accelerating.[17][18] Techniques were developed for reconstructing supernova explosions that have no written records of being observed. The date of the Cassiopeia A supernova event was determined from light echoes off nebulae,[19] while the age of supernova remnant RX J0852.0-4622 was estimated from temperature measurements[20] and the gamma ray emissions from the decay of titanium-44.[21] In 2009, nitrates were discovered in Antarctic ice deposits that matched the times of past supernova events.[22][23]

[edit] Discovery

Early work on what was originally believed to be simply a new category of novae was performed during the 1930s by Walter Baade and Fritz Zwicky at Mount Wilson Observatory.[24] The name super-novae was first used during 1931

lectures held at Caltech by Baade and Zwicky, then used publicly in 1933 at a meeting of the American Physical Society.[4] By 1938, the hyphen had been lost and the modern name was in use.[25] Because supernovae are relatively rare events within a galaxy, occurring about once every 50 years in the Milky Way,[5] obtaining a good sample of supernovae to study requires regular monitoring of many galaxies.

Supernovae in other galaxies cannot be predicted with any meaningful accuracy. Normally, when they are discovered, they are already in progress.[26] Most scientific interest in supernovae is as standard candles for measuring distance, for example, they require an observation of their peak luminosity. It is therefore important to discover them well before they reach their maximum. Amateur astronomers, who greatly outnumber professional astronomers, have played an important role in finding supernovae, typically by looking at some of the closer galaxies through an optical telescope and comparing them to earlier photographs.[27]

Toward the end of the 20th century astronomers increasingly turned to computer-controlled telescopes and CCDs for hunting supernovae. While such systems are popular with amateurs, there are also professional installations such as the Katzman Automatic Imaging Telescope.[28] Recently the Supernova Early Warning System (SNEWS) project has begun using a network of neutrino detectors to give early warning of a supernova in the Milky Way galaxy.[29][30] Neutrinos are particles that are produced in great quantities by a supernova explosion,[31] and they are not significantly absorbed by the interstellar gas and dust of the galactic disk.

Supernova searches fall into two classes: those focused on relatively nearby events and those looking for explosions farther away. Because of the expansion of the universe, the distance to a remote object with a known emission spectrum can be estimated by measuring its Doppler shift (or redshift); on average, more distant objects recede with greater velocity than those nearby, and so have a higher redshift. Thus the search is split between high redshift and low redshift, with the boundary falling around a redshift range of $z \approx 0.1$ to 0.3 [32] where z is a dimensionless measure of the spectrum's frequency shift.

High redshift searches for supernovae usually involve the observation of supernova light curves. These are useful for standard or calibrated candles to generate Hubble diagrams and make cosmological predictions. Supernova spectroscopy, used to study the physics and environments of supernovae, is more practical at low than at high redshift.[33][34] Low redshift observations also anchor the low-distance end of the Hubble curve, which is a plot of distance versus redshift for visible galaxies.[35][36] (See also Hubble's law).

[edit] Naming convention

Supernova discoveries are reported to the International Astronomical Union's Central Bureau for Astronomical Telegrams, which sends out a circular with the name it assigns to that supernova. The name is the marker SN followed by the year of discovery, suffixed with a one or two-letter designation. The first 26 supernovae of the year are designated with a capital letter from A to Z. Afterward pairs of lower-case letters are used: aa, ab, and so on. Hence, for example, SN 2003C designates the third supernova reported in the year 2003.[37] The last supernova of 2005 was SN 2005nc, indicating that it was the 367th supernova found in 2005. Since 2000, professional and amateur astronomers find several hundreds of supernovae each year (572 in 2007, 261 in 2008, 390 in 2009).[38][39]

Historical supernovae are known simply by the year they occurred: SN 185, SN 1006, SN 1054, SN 1572 (called Tycho's Nova) and SN 1604 (Kepler's Star). Since 1885 the additional letter notation has been used, even if there was only one supernova discovered that year (e.g. SN 1885A, SN 1907A, etc.) and this last happened with SN 1947A. SN, for SuperNova, is a standard prefix. Until 1987, two-letter designations were rarely needed; since 1988, however, they have been needed every year.

[edit] Classification

As part of the attempt to understand supernovae, astronomers have classified them according to their light curves and the absorption lines of different chemical elements that appear in their spectra. The first element for division is the presence or absence of a line caused by hydrogen. If a supernova's spectrum contains lines of hydrogen (known as the Balmer series in the visual portion of the spectrum) it is classified Type II; otherwise it is Type I. In each of these two types there are subdivisions according to the presence of lines from other elements or the shape of the light curve (a graph of the supernova's apparent magnitude as a function of time).[40][41]

Supernova taxonomy[41][42]

Type I

No hydrogen

Type Ia

Presents a singly ionized silicon (Si II) line at 615.0 nm (nanometers), near peak light

Type Ib/c

Weak or no silicon absorption feature

Type Ib

Shows a non-ionized helium (He I) line at 587.6 nm

Type Ic

Weak or no helium

Type II

Shows hydrogen

Type II-P/L/N

Type II spectrum throughout

Type II-P/L

No narrow lines

Type II-P

Reaches a "plateau" in its light curve

Type II-L

Displays a "linear" decrease in its light curve (linear in magnitude versus time).[43]

Type IIn

Some narrow lines

Type IIb

Spectrum changes to become like Type Ib

[edit] Type I

The type I supernovae are subdivided on the basis of their spectra, with type Ia showing a strong ionised silicon absorption line. Type I supernova without this strong line are classified as types Ib and Ic, with type Ib showing strong neutral helium lines and type Ic lacking them. The light curves are all similar although type Ia are generally brighter at peak luminosity, but the light curve is not important for classification of type I supernovae.

A small number of type Ia supernovae exhibit unusual features such as non-standard luminosity or broadened light curves, and these are typically classified by referring to the earliest example showing similar features. For example the sub-luminous SN 2008ha is often referred to as SN 2002cx-like or class Ia-2002cx.

[edit] Type II

The supernovae of Type II can also be sub-divided based on their spectra. While most Type II supernova show very broad emission lines which indicate expansion velocities of many thousands of kilometres per second, some such as SN 2005gl have relatively narrow features in their spectra. These are called Type IIn, where the 'n' stands for 'narrow'.

A few supernovae, such as SN 1987K and SN 1993J, appear to change types: they show lines of hydrogen at early times, but, over a period of weeks to months, become dominated by lines of helium. The term "Type IIb" is used to describe the combination of features normally associated with Types II and Ib.[41]

Type II supernovae with normal spectra dominated by broad hydrogen lines that remain for the life of the decline are classified on the basis of their light

curves. The most common type shows a distinctive "plateau" in the light curve shortly after peak brightness where the visual luminosity stays relatively constant for several months before the decline resumes. These are called type II-P referring to the plateau. Less common are type II-L supernovae that lack a distinct plateau. The "L" signifies "linear" although the light curve is not actually a straight line.

Supernovae that do not fit into the normal classifications are designated peculiar, or 'pec'. [41]

[edit] Current models

The type codes described above that astronomers give to supernovas are taxonomic in nature: the type number describes the light observed from the supernova, not necessarily its cause. For example, type Ia supernovae are produced from degenerate white dwarf progenitors by accretion of material while the spectrally similar type Ib/c are produced from massive Wolf-Rayet progenitors by core collapse. The following summarizes what astronomers currently believe are the most plausible explanations for supernovae.

[edit] Thermal Runaway

A white dwarf star may accumulate sufficient material from a stellar companion (either through accretion or via a merger) to raise its core temperature enough to ignite carbon fusion, at which point it undergoes runaway nuclear fusion, completely disrupting it. The vast majority [clarification needed] are thought to be produced by the gradual accretion of hydrogen and some helium. Because this type of supernova ignition always occurs in stars with almost identical mass and very similar chemical composition, type Ia supernovae have very uniform properties and are useful as standard candles over intergalactic distances. Some calibrations are required to compensate for the gradual change in properties or different frequencies of abnormal luminosity supernovae at high red shift, and for small variations in brightness identified by light curve shape or spectrum. [44][45]

[edit] Normal Type Ia

There are several means by which a supernova of this type can form, but they share a common underlying mechanism. If a carbon-oxygen [nb 2] white dwarf accreted enough matter to reach the Chandrasekhar limit of about 1.38 solar masses [46] (for a non-rotating star), it would no longer be able to support the bulk of its plasma through electron degeneracy pressure [47][48] and would begin to collapse. However, the current view is that this limit is not normally attained; increasing temperature and density inside the core ignite carbon fusion as the star approaches the limit (to within about 1% [49]), before collapse is initiated. [46] Within a few seconds, a substantial fraction of the matter in the white dwarf undergoes nuclear fusion, releasing enough energy (1×10^{44} joules) [50] to unbind the star in a supernova explosion. [51] An outwardly expanding shock wave is generated, with matter reaching velocities on the order of 5,000–20,000 km/s, or roughly 3% of the speed of light. There is also a significant increase in luminosity, reaching an absolute magnitude of -19.3 (or 5 billion times brighter than the Sun), with little variation. [52]

The model for the formation of this category of supernova is a closed binary star system. The larger of the two stars is the first to evolve off the main sequence, and it expands to form a red giant. [53] The two stars now share a common envelope, causing their mutual orbit to shrink. The giant star then sheds most of its envelope, losing mass until it can no longer continue nuclear fusion. At this point it becomes a white dwarf star, composed primarily of carbon and oxygen. [54][55] Eventually the secondary star also evolves off the main sequence to form a red giant. Matter from the giant is accreted by the white dwarf, causing the latter to increase in mass. Despite widespread acceptance of the basic model, the exact details of initiation and of the heavy elements produced in the explosion are still unclear.

Type Ia supernovae follow a characteristic light curve—the graph of luminosity as a function of time—after the explosion. This luminosity is generated by the radioactive decay of nickel-56 through cobalt-56 to iron-56. [52] The peak luminosity of the light curve is extremely consistent across normal Type Ia

supernovae, having a maximum absolute magnitude of about -19.3 . This allows them to be used as a secondary standard candle to measure the distance to their host galaxies.[57]

[edit] Non-standard Type Ia

Another model for the formation of a Type Ia explosion involves the merger of two white dwarf stars, with the combined mass momentarily exceeding the Chandrasekhar limit.[58] There is much variation in this type of explosion,[59] and in many cases there may be no supernova at all, but it is expected that they will have a broader and less luminous light curve than the more normal type Ia explosions.

Abnormally bright type Ia supernovae are expected when the white dwarf already has a mass higher than the Chandrasekhar limit,[60] possibly enhanced further by asymmetry,[61] but the ejected material will have less than normal kinetic energy.

There is no formal sub-classification for the non-standard type Ia supernovae.

[edit] Core collapse

Very massive stars can undergo core collapse when nuclear fusion suddenly becomes unable to sustain the core against its own gravity; this is the cause of all types of supernova except type Ia. The collapse may cause violent expulsion of the outer layers of the star resulting in a supernova, or the release of gravitational potential energy may be insufficient and the star may collapse into a black hole or neutron star with little radiated energy.

Core collapse can be caused by several different mechanisms: electron capture; exceeding the Chandrasekhar limit; pair-instability; or photodisintegration.[62][63] When a massive star develops an iron core larger than the Chandrasekhar mass it will no longer be able to support itself by electron degeneracy pressure and will collapse further to a neutron star or black hole. Electron capture by magnesium in a degenerate O/Ne/Mg core causes gravitational collapse followed by explosive oxygen fusion, with very similar results. Electron-positron pair production in a large post-helium burning core removes thermodynamic support and causes initial collapse followed by runaway fusion, resulting in a pair-instability supernova. A sufficiently large and hot stellar core may generate gamma-rays energetic enough to initiate photodisintegration directly, which will cause a complete collapse of the core.

The table below lists the known reasons for core collapse in massive stars, the types of star that they occur in, their associated supernova type, and the remnant produced. The metallicity is the proportion of elements other than hydrogen or helium, as compared to the Sun. The initial mass is the mass of the star prior to the supernova event, given in multiples of the Sun's mass, although the mass at the time of the supernova may be much lower. Type II_n supernovae are not listed in the table. They can potentially be produced by various types of core collapse in different progenitor stars, possibly even by type Ia white dwarf ignitions, although it seems that most will be from iron core collapse in luminous supergiants or hypergiants (including LBVs). The narrow spectral lines for which they are named occur because the supernova is expanding into a small dense cloud of circumstellar material.[64]

Core collapse scenarios by mass and metallicity[62]

Cause of collapse

Progenitor star approximate initial mass

Supernova Type

Remnant

Electron capture in a degenerate O+Ne+Mg core

8×10^3

Faint II-P

Neutron star

Iron core collapse

10×10^3

Faint II-P

Neutron star

25×10^3 with low or solar metallicity

Normal II-P

Black hole after fallback of material onto an initial neutron star

25 \hat{A} 40 with very high metallicity

II-L or II-b

Neutron star

40 \hat{A} 90 with low metallicity

None

Black hole

\hat{A} 40 with near-solar metallicity

Faint Ib/c, or hypernova with GRB

Black hole after fallback of material onto an initial neutron star

\hat{A} 40 with very high metallicity

Ib/c

Neutron star

\hat{A} 90 with low metallicity

None, possible gamma-ray burst (GRB)

Black hole

Pair instability

140 \hat{A} 250 with low metallicity

II-P, sometimes a hypernova, possible GRB

No remnant

Photodisintegration

\hat{A} 250 with low metallicity

None (or luminous supernova?), possible GRB

Massive black hole

When a stellar core is no longer supported against gravity it collapses in on itself with velocities reaching 70,000 \hat{A} km/s (0.23c),[65] resulting in a rapid increase in temperature and density. What follows next depends on the mass and structure of the collapsing core, with low mass degenerate cores forming neutron stars, higher mass degenerate cores mostly collapsing completely to black holes, and non-degenerate cores undergoing runaway fusion.

The initial collapse of degenerate cores is accelerated by beta decay, photodisintegration and electron capture, which causes a burst of electron neutrinos. As the density increases, neutrino emission is cut off as they become trapped in the core. The inner core eventually reaches typically 30 \hat{A} km diameter[66] and a density comparable to that of an atomic nucleus, and neutron degeneracy pressure tries to halt the collapse. If the core mass is more than about 15 solar masses then neutron degeneracy is insufficient to stop the collapse and a black hole forms directly with no supernova explosion.

In lower mass cores the collapse is stopped and the newly formed neutron core has an initial temperature of about 100 \hat{A} billion kelvin, 6000 times the temperature of the sun's core.[67] 'Thermal' neutrinos form as neutrino-antineutrino pairs of all flavors, and total several times the number of electron-capture neutrinos.[68] About 1046 \hat{A} joules, approximately 10% of the star's rest mass, is converted into a ten-second burst of neutrinos which is the main output of the event.[66][69] The suddenly halted core collapse rebounds and produces a shock wave that stalls within milliseconds[70] in the outer core as energy is lost through the dissociation of heavy elements. A process that is not clearly understood[update] is necessary to allow the outer layers of the core to reabsorb around 1044 \hat{A} joules[71] (1 \hat{A} foe) from the neutrino pulse, producing the visible explosion,[72] although there are also other theories on how to power the explosion.[66]

Some material from the outer envelope falls back onto the neutron star, and for cores beyond about eight solar masses there is sufficient fallback to form a black hole. This fallback will reduce the kinetic energy of the explosion and the mass of expelled radioactive material, but in some situations it may also generate relativistic jets that result in a gamma-ray burst or an exceptionally luminous supernova.

Collapse of massive non-degenerate cores will ignite further fusion. When the core collapse is initiated by pair instability, oxygen fusion begins and the

collapse may be halted. For core masses of $40 \hat{=} 60$ solar masses, the collapse halts and the star remains intact, but core collapse will occur again when a larger core has formed. For cores of around $60 \hat{=} 130$ solar masses, the fusion of oxygen and heavier elements is so energetic that the entire star is disrupted, causing a supernova. At the upper end of the mass range, the supernova is unusually luminous and extremely long-lived due to many solar masses of ejected Ni^{56} . For even larger core masses, the core temperature becomes high enough to allow photodisintegration and the core collapses completely into a black hole.[73]

[edit] Type II

Stars with initial masses less than about eight times the sun, never develop a core large enough to collapse and they eventually lose their atmospheres to become white dwarfs. Stars with at least nine solar masses of material evolve in a complex fashion, progressively burning heavier elements at hotter temperatures in their cores.[66][74] The star becomes layered like an onion, with the burning of more easily fused elements occurring in larger shells.[75][76]

When core collapse occurs during a supergiant phase when the star still has a hydrogen envelope, the result is a type II supernova. The rate of mass loss of luminous stars depends on the metallicity and luminosity. Extremely luminous stars at near solar metallicity will lose all their hydrogen before they reach core collapse and so will not form a type II supernova. At low metallicity, all stars will reach core collapse with a hydrogen envelope but sufficiently massive stars collapse directly to a black hole without producing a visible supernova.

Stars with an initial mass up to about 90 times the sun, or a little less at high metallicity, are expected to result in a type II-P supernova which is the most commonly observed type. At moderate to high metallicity, stars near the upper end of that mass range will have lost most of their hydrogen when core collapse occurs and the result will be a type II-L supernova. At very low metallicity, stars of around $140 \hat{=} 250$ solar masses will reach core collapse by pair instability while they still have a hydrogen atmosphere and an oxygen core and the result will be a supernova with type II characteristics but a very large mass of ejected Ni^{56} and high luminosity.

[edit] Type Ib and Ic

These supernovae, like those of type II, are massive stars that undergo core collapse. However the stars which become Types Ib and Ic supernovae have lost most of their outer (hydrogen) envelopes due to strong stellar winds or else from interaction with a companion.[79] These stars are known as Wolf-Rayet stars, and they occur at moderate to high metallicity where continuum driven winds cause sufficiently high mass loss rates. Observations of type Ib/c supernova do not match the observed or expected occurrence of Wolf Rayet stars and alternate explanations for this type of core collapse supernova involve stars stripped of their hydrogen by binary interactions. Binary models provide a better match for the observed supernovae, with the proviso that no suitable binary helium stars have ever been observed.[80] Since a supernova explosion can occur whenever the mass of the star at the time of core collapse is low enough not to cause fallback to a black hole, any massive star may result in a supernova if it loses enough mass before core collapse occurs.

Type Ib supernovae are the more common and result from Wolf-Rayet stars of type WC which still have helium in their atmospheres. For a narrow range of masses, stars evolve further before reaching core collapse to become WO stars with very little helium remaining and these are the progenitors of type Ic supernovae.

A few percent of the type Ic supernovae are associated with gamma ray bursts (GRB), though it is also believed that any hydrogen-stripped type Ib or Ic supernova could produce a GRB, depending on the geometry of the explosion.[81]

[edit] Light curves

The visual light curves of the different supernova types vary in shape and amplitude, based on the underlying mechanisms of the explosion, the way that

visible radiation is produced, and the transparency of the ejected material. The light curves can be significantly different at other wavelengths. For example, at UV and shorter wavelengths there is an extremely luminous peak lasting just a few hours, corresponding to the shock breakout of the initial explosion, which is hardly detectable at longer wavelengths.

The light curves for type Ia are mostly very uniform, with a consistent maximum absolute magnitude and a relatively steep decline in luminosity. The energy output is driven by radioactive decay of nickel-56 (half life 6 days), which then decays to radioactive cobalt-56 (half life 77 days). These radioisotopes from material ejected in the explosion excite surrounding material to incandescence. The initial phases of the light curve decline steeply as the effective size of the photosphere decreases and trapped electromagnetic radiation is depleted. The light curve continues to decline in the B band while it may show a small shoulder in the visual at about 40 days, but this is only a hint of a secondary maximum that occurs in the infra-red as certain ionised heavy elements recombine to produce infra-red radiation and the ejecta become transparent to it. The visual light curve continues to decline at a rate slightly greater than the decay rate of the radioactive cobalt (which has the longer half life and controls the later curve), because the ejected material becomes more diffuse and less able to convert the high energy radiation into visual radiation. After several months, the light curve changes its decline rate again as positron emission becomes dominant from the remaining cobalt-56, although this portion of the light curve has been little-studied.

Type Ib and Ic light curves are basically similar to type Ia although with a lower average peak luminosity. The visual light output is again due to radioactive decay being converted into visual radiation, but there is a much lower mass of nickel-56 produced in these types of explosion. The peak luminosity varies considerably and there are even occasional type Ib/c supernovae orders of magnitude more and less luminous than the norm. The most luminous type Ic supernovae are referred to as hypernovae and tend to have broadened light curves in addition to the increased peak luminosity. The source of the extra energy is thought to be relativistic jets driven by the formation of a rotating black hole, which also produce gamma-ray bursts.

The light curves for type II supernovae are characterised by a much slower decline than type I, on the order of 0.05 magnitudes per day,[82] excluding the plateau phase. The visual light output is dominated by kinetic energy rather than radioactive decay for several months, due primarily to the existence of hydrogen in the ejecta from the atmosphere of the supergiant progenitor star. In the initial explosion this hydrogen becomes heated and ionised. The majority of type II supernovae show a prolonged plateau in their light curves as this hydrogen recombines, emitting visible light and becoming more transparent. This is then followed by a declining light curve driven by radioactive decay although slower than in type I supernovae, due to the efficiency of conversion into light by all the hydrogen.[83]

In type II-L the plateau is absent because the progenitor had relatively little hydrogen left in its atmosphere, sufficient to appear in the spectrum but insufficient to produce a noticeable plateau in the light output. In type IIb supernovae the hydrogen atmosphere of the progenitor is so depleted (thought to be due to tidal stripping by a companion star) that the light curve is closer to a type I supernova and the hydrogen even disappears from the spectrum after several weeks.[43]

Type IIn supernovae are characterised by additional narrow spectral lines produced in a dense shell of circumstellar material. Their light curves are generally very broad and extended, occasionally also extremely luminous and referred to as a hypernova. These light curves are produced by the highly efficient conversion of kinetic energy of the ejecta into electromagnetic radiation by interaction with the dense shell of material. This only occurs when the material is sufficiently dense and compact, indicating that it has been produced by the progenitor star itself only shortly before the supernova occurs.

Large numbers of supernovae have been catalogued and classified to provide distance candles and test models. Average characteristics vary somewhat with distance and type of host galaxy, but can broadly be specified for each supernova type.

Physical properties of supernovae by type[84][85]

Typea

Average peak absolute magnitudeb

Approximate energy (foe)c

Days to peak luminosity

Days from peak to 10% luminosity

Ia

$\hat{a} \sim 19$

1

approx. 19

around 60

Ib/c \hat{A} (faint)

around $\hat{a} \sim 15$

0.1

$15\hat{a} \sim 25$

unknown

Ib

around $\hat{a} \sim 17$

1

$15\hat{a} \sim 25$

$40\hat{a} \sim 100$

Ic

around $\hat{a} \sim 16$

1

$15\hat{a} \sim 25$

$40\hat{a} \sim 100$

Ic \hat{A} (bright)

to $\hat{a} \sim 22$

above 5

roughly 25

roughly 100

II-b

around $\hat{a} \sim 17$

1

around 20

around 100

II-L

around $\hat{a} \sim 17$

1

around 13

around 150

II-P \hat{A} (faint)

around $\hat{a} \sim 14$

0.1

roughly 15

unknown

II-P

around $\hat{a} \sim 16$

1

around 15

Plateau then around 50

IIInd

around $\hat{a} \sim 17$

1

$12\hat{a} \sim 30$ or more

$50\hat{a} \sim 150$

IIn (bright)
to ~ 22
above 5
above 50
above 100
Notes:

- a. ^ Faint types may be a distinct sub-class. Bright types may be a continuum from slightly over-luminous to hypernovae.
- b. ^ These magnitudes are measured in the R band. Measurements in V or B bands are common and will be around half a magnitude brighter for supernovae.
- c. ^ Order of magnitude kinetic energy. Total electromagnetic radiated energy is usually lower, (theoretical) neutrino energy much higher.
- d. ^ Probably a heterogeneous group, any of the other types embedded in nebulosity.

[edit] Asymmetry

A long-standing puzzle surrounding Type II supernovae is why the compact object remaining after the explosion is given a large velocity away from the core.[87] (Neutron stars are observed, as pulsars, to have high velocities; black holes presumably do as well, but are far harder to observe in isolation.) The initial impetus can be substantial, propelling an object of more than a solar mass at a velocity of 500 km/s or greater. This displacement indicates an asymmetry in the explosion, but the mechanism by which this momentum is transferred to the compact object remains a puzzle. Proposed explanations for this kick include convection in the collapsing star and jet production during neutron star formation.

One possible explanation for the asymmetry in the explosion is large-scale convection above the core. The convection can create variations in the local abundances of elements, resulting in uneven nuclear burning during the collapse, bounce and resulting explosion.[88]

Another possible explanation is that accretion of gas onto the central neutron star can create a disk that drives highly directional jets, propelling matter at a high velocity out of the star, and driving transverse shocks that completely disrupt the star. These jets might play a crucial role in the resulting supernova explosion.[89][90] (A similar model is now favored for explaining long gamma ray bursts.)

Initial asymmetries have also been confirmed in Type Ia supernova explosions through observation. This result may mean that the initial luminosity of this type of supernova depends on the viewing angle. However, the explosion becomes more symmetrical with the passage of time. Early asymmetries are detectable by measuring the polarization of the emitted light.[91]

[edit] Energy output

Although we are used to thinking of supernovae primarily as luminous visible events, the electromagnetic radiation they produce is almost a minor side-effect of the explosion. Particularly in the case of core collapse supernovae, the emitted electromagnetic radiation is a tiny fraction of the total event energy.

There is a fundamental difference between the balance of energy production in the different types of supernova. In type Ia white dwarf detonations, most of the explosion energy is directed into heavy element synthesis and kinetic energy of the ejecta. In core collapse supernovae, the vast majority of the energy is directed into neutrino emission, and while some of this apparently powers the main explosion 99%+ of the neutrinos escape in the first few minutes following the start of the collapse.

Type Ia supernovae derive their energy from runaway nuclear fusion of a carbon-oxygen white dwarf. Details of the energetics are still not fully modelled, but the end result is the ejection of the entire mass of the original star with high kinetic energy. Around half a solar mass of this is ^{56}Ni generated from silicon burning. ^{56}Ni is radioactive and generates ^{56}Co by beta

plus decay with a half life of six days, plus gamma rays. Co56 itself decays by the beta plus path with a half life of 77 days to stable Fe56. These two processes are responsible for the electromagnetic radiation from type Ia supernovae. In combination with the changing transparency of the ejected material, they produce the rapidly declining light curve.[92]

Core collapse supernovae are on average visually fainter than type Ia supernovae, but the total energy released is far higher. This is driven by gravitational potential energy from the core collapse, initially producing electron neutrinos from disintegrating nucleons, followed by all flavours of thermal neutrinos from the super-heated neutron star core. Around 1% of these neutrinos are thought to deposit sufficient energy into the outer layers of the star to drive the resulting explosion, but again the details cannot be reproduced exactly in current models. Kinetic energies and nickel yields are somewhat lower than type Ia supernovae, hence the reduced visual luminosity, but energy from the ionisation of the many solar masses of remaining hydrogen can contribute to a much slower decline in luminosity and produce the plateau phase seen in the majority of core collapse supernovae.

Energetics of supernovae

Supernova

Approximate total energy

(foe)c

Ejected Ni

(solar masses)

Neutrino energy

(foe)

Kinetic energy

(foe)

Electromagnetic radiation

(foe)

Type Ia [92][93][94]

1.5

$0.4 \hat{=} 0.8$

0.1

$1.3 \hat{=} 1.4$

~0.01

Core collapse [95][96]

100

$(0.01) \hat{=} 1$

100

1

$0.001 \hat{=} 0.01$

Hypernova

100

~1

100

1

~0.1

Pair instability [73]

$5 \hat{=} 100$

$0.5 \hat{=} 50$

low?

$1 \hat{=} 100$

$0.01 \hat{=} 0.1$

In some core collapse supernovae, fallback onto a black hole drives relativistic jets which may produce a brief energetic and directional burst of gamma-rays and also transfers substantial further energy into the ejected material. This is one scenario for producing high luminosity supernovae and is thought to be the cause of type Ic hypernovae and long duration gamma-ray bursts. If the relativistic jets are too brief and fail to penetrate the stellar envelope then a low luminosity gamma-ray burst may be produced and the

supernova may be sub-luminous.

When a supernova occurs inside a small dense cloud of circumstellar material then it will produce a shock wave that can efficiently convert a high fraction of the kinetic energy into electromagnetic radiation. Even though the initial explosion energy was entirely normal the resulting supernova will have high luminosity and extended duration since it does not rely on exponential radioactive decay. This type of event may cause type IIn hypernovae.

Although pair-instability supernovae are core collapse supernovae with spectra and light curves similar to type II-P, the nature of the explosion following core collapse is more like a giant type Ia with runaway fusion of carbon, oxygen, and silicon. The total energy released by the highest mass events is comparable to other core collapse supernovae but neutrino production is thought to be very low, hence the kinetic and electromagnetic energy is very high. The cores of these stars are much larger than any white dwarf and the amount of radioactive nickel and other heavy elements ejected can be orders of magnitude higher, with consequently high visual luminosity.

[edit] Progenitor

The supernova classification type is closely tied to the type of star at the time of the explosion. The occurrence of each type of supernova depends dramatically on the metallicity and hence the age of the host galaxy.

Type Ia supernovae are produced from white dwarf stars in binary systems and occur in all galaxy types. Core collapse supernovae are only found in galaxies undergoing current or very recent star formation, since they result from short-lived massive stars. They are most commonly found in type Sc spirals, but also in the arms of other spiral galaxies and in irregular galaxies, especially starburst galaxies.

Type Ib/c and II-L, and possibly most type IIn, supernovae are only thought to be produced from stars having near-solar metallicity levels that result in high mass loss from massive stars, hence they are less common in older more distant galaxies. The table shows the expected progenitor for the main types of core collapse supernova, and the approximate proportions of each in the local neighbourhood.

Fraction of core collapse supernovae types by progenitor[42]

Type

Progenitor star

Fraction

Ib

WC Wolf-Rayet

10%

Ic

WO Wolf-Rayet

10%

II-P

Supergiant

70%

II-L

Supergiant with a depleted hydrogen shell

10%

IIn

Supergiant in a dense cloud of expelled material (such as LBV)

low

IIb

Supergiant with highly depleted hydrogen (stripped by companion?)

low

[edit] Interstellar impact

[edit] Source of heavy elements

Supernovae are a key source of elements heavier than oxygen.[97] These elements are produced by nuclear fusion (for iron-56 and lighter elements), and by nucleosynthesis during the supernova explosion for elements heavier than iron.[98] Supernovae are the most likely, although not undisputed, candidate

sites for the r-process, which is a rapid form of nucleosynthesis that occurs under conditions of high temperature and high density of neutrons. The reactions produce highly unstable nuclei that are rich in neutrons. These forms are unstable and rapidly beta decay into more stable forms.

The r-process reaction, which is likely to occur in type II supernovae, produces about half of all the element abundance beyond iron, including plutonium and uranium.[99] The only other major competing process for producing elements heavier than iron is the s-process in large, old red giant stars, which produces these elements much more slowly, and which cannot produce elements heavier than lead.[100]

[edit] Role in stellar evolution

The remnant of a supernova explosion consists of a compact object and a rapidly expanding shock wave of material. This cloud of material sweeps up the surrounding interstellar medium during a free expansion phase, which can last for up to two centuries. The wave then gradually undergoes a period of adiabatic expansion, and will slowly cool and mix with the surrounding interstellar medium over a period of about 10,000 years.[101]

The Big Bang produced hydrogen, helium, and traces of lithium, while all heavier elements are synthesized in stars and supernovae. Supernovae tend to enrich the surrounding interstellar medium with metals—elements other than hydrogen and helium.

These injected elements ultimately enrich the molecular clouds that are the sites of star formation.[102] Thus, each stellar generation has a slightly different composition, going from an almost pure mixture of hydrogen and helium to a more metal-rich composition. Supernovae are the dominant mechanism for distributing these heavier elements, which are formed in a star during its period of nuclear fusion. The different abundances of elements in the material that forms a star have important influences on the star's life, and may decisively influence the possibility of having planets orbiting it.

The kinetic energy of an expanding supernova remnant can trigger star formation due to compression of nearby, dense molecular clouds in space.[103] The increase in turbulent pressure can also prevent star formation if the cloud is unable to lose the excess energy.[7]

Evidence from daughter products of short-lived radioactive isotopes shows that a nearby supernova helped determine the composition of the Solar System 4.5 billion years ago, and may even have triggered the formation of this system.[104] Supernova production of heavy elements over astronomic periods of time ultimately made the chemistry of life on Earth possible.

[edit] Effect on Earth

A near-Earth supernova is a supernova close enough to the Earth to have noticeable effects on its biosphere. Depending upon the type and energy of the supernova, it could be as far as 3000 light-years away. Gamma rays from a supernova would induce a chemical reaction in the upper atmosphere converting molecular nitrogen into nitrogen oxides, depleting the ozone layer enough to expose the surface to harmful solar and cosmic radiation. This has been proposed as the cause of the Ordovician–Silurian extinction, which resulted in the death of nearly 60% of the oceanic life on Earth.[105] In 1996 it was theorized that traces of past supernovae might be detectable on Earth in the form of metal isotope signatures in rock strata. Iron-60 enrichment was later reported in deep-sea rock of the Pacific Ocean.[106][107][108] In 2009, elevated levels of nitrate ions were found in Antarctic ice, which coincided with the 1006 and 1054 supernovae. Gamma rays from these supernovae could have boosted levels of nitrogen oxides, which became trapped in the ice.[109]

Type Ia supernovae are thought to be potentially the most dangerous if they occur close enough to the Earth. Because these supernovae arise from dim, common white dwarf stars, it is likely that a supernova that can affect the Earth will occur unpredictably and in a star system that is not well studied. One theory suggests that a Type Ia supernova would have to be closer than a thousand parsecs (3300 light-years) to affect the Earth.[110] The closest known candidate is IK Pegasi (see below).[111] Recent estimates predict that a Type

II supernova would have to be closer than eight parsecs (26 light-years) to destroy half of the Earth's ozone layer.[112]

[edit] Milky Way candidates

Several large stars within the Milky Way have been suggested as possible supernovae within the next million years. These include Rho Cassiopeiae,[114] Eta Carinae,[115][116] RS Ophiuchi,[117][118] U Scorpii,[119] VY Canis Majoris,[120] Betelgeuse, Antares, and Spica.[121] Many Wolf-Rayet stars, such as Gamma Velorum,[122] WR 104,[123] and those in the Quintuplet Cluster,[124] are also considered possible precursor stars to a supernova explosion in the 'near' future.

The nearest supernova candidate is IK Pegasi (HR 8210), located at a distance of 150 light-years. This closely orbiting binary star system consists of a main sequence star and a white dwarf 31 million kilometres apart. The dwarf has an estimated mass 1.15 times that of the Sun.[125] It is thought that several million years will pass before the white dwarf can accrete the critical mass required to become a Type Ia supernova.[126][127]

[edit] See also

[edit] References

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1926 World Series

Babe Ruth registers the last out of the 1926 World Series at second base as he is caught stealing.

Dates:

October 2â ^10

Radio:

Westinghouse Broadcasting

Radio announcers:

Graham McNamee and Phillips Carlin[1][2]

Umpires:

Bill Dinneen, Hank O'Day, Bill Klem, George Hildebrand

Hall of Famers:

Umpire: Bill Klem Cardinals: Grover Cleveland Alexander, Jim Bottomley, Chick Hafey, Jesse Haines, Rogers Hornsby (player-manager), Billy Southworth.â ; Yankees: Miller Huggins (manager), Earl Combs, Lou Gehrig, Tony Lazzeri, Herb Pennock, Babe Ruth, Waite Hoyt.â ; elected as a manager.

The 1926 World Series pitted the NL champion St. Louis Cardinals against the AL champion New York Yankees. The Cardinals defeated the Yankees four games to three in the best-of-seven series, which took place from October 2 to October 10, 1926 at Yankee Stadium and Sportsman's Park.

This was the first World Series appearance for the Cards, the first of eleven World Series championships in Cardinals history ending with 2011, while the Yanks were in their fourth World Series in six years, winning one for the first time in 1923.[3] They would play in another 36 World Series through the end of the 2012 season.[4]

In GameÂ 1, Herb Pennock pitched the Yanks to a 2â ^1 win over the Cards. In GameÂ 2, pitcher Grover Cleveland Alexander evened the Series for the Cards with a 6â ^2 victory. Knuckleballer Jesse Haines' complete game shutout in GameÂ 3 gave St. Louis a 2â ^1 Series lead. In the Yanks' 10â ^5 GameÂ 4 win, Babe Ruth hit three home runs, a World Series record equaled only four times since.[5] According to newspaper reports, Ruth had promised a sickly boy named Johnny Sylvester to hit a home run for him in GameÂ 4. After Ruth's three-homer game, the boy's condition miraculously improved. The newspapers' account of the story is disputed by contemporary baseball historians, but it remains one of the most famous anecdotes in baseball history. Pennock again won for the Yanks in GameÂ 5, 3-2.

Cards' player-manager Rogers Hornsby chose Alexander to start GameÂ 6, and used him in relief to close out GameÂ 7. Behind Alexander, the Cardinals won the final two games of the series, and with it the world championship. In GameÂ 7, the Yankees, trailing 3â ^2 in the bottom of the ninth inning and down to their last out, Ruth walked, bringing up Bob Meusel. Ruth, successful in half of his steal attempts careerwise, stealing bases,[6] took off for second base on the first pitch. Meusel swung and missed, and catcher Bob O'Farrell threw to second baseman Hornsby who tagged Ruth out, ending Game 7 and thereby crowning his Cardinals World Series champions for the first time.[7](p80)

[edit] Season summary

The Cardinals won the 1926 National League pennant with 89Â wins and 65Â losses, two games ahead of the runner-up Cincinnati Reds, after finishing only fourth in 1925 at 77-76. Before 1926 was half over, they traded outfielder Heinie Mueller to the New York Giants for outfielder Billy Southworth. They also claimed future Hall of Fame pitcher Grover Cleveland Alexander on waivers from the Chicago Cubs.[8] Their starting rotation was led by Flint Rhem with 20 wins and a 3.21 earned run average (ERA), far surpassing his eight wins and 4.92 ERA of 1925.[9] Offensively, the Cardinals were led by Jim Bottomley, Rogers Hornsby (who had hit over .400 in 1925) and catcher Bob O'Farrell, 1926 National League MVP-to-be.

The 1926 NL pennant race was heated. During the second and third weeks of September, both the Cardinals and the Reds had multi-game winning streaks and traded first and second place almost every day.[10] On September 17, the Cards took a one-game lead over the Reds and extended their lead when the Reds lost several games in a row. They lost the last game of the season to the Reds on September 26, but still finished two games ahead of them in first place in the final standings.[11]

The Yanks had the best record in the AL at 91-63, finishing three games ahead

of the Cleveland Indians[12] and greatly improving on their 69-win, seventh-place 1925 season, making Lou Gehrig their permanent starting first baseman and trading for rookie second baseman Tony Lazzeri in the offseason. Gehrig, Lazzeri, Ruth and Earle Combs led the offense, while Pennock and Urban Shocker led the starting rotation with 42 wins between them.

In early September 1926, thousands of Cleveland fans, confident that their Indians would win the pennant even when they trailed the Yanks by six games, made World Series ticket reservations.[13] By September 23 they were only two games behind New York, but then lost three of their final four games to finish the season three games behind.[14]

On September 11, Baseball Commissioner Kenesaw Mountain Landis met with representatives from four of the top teams in each of the two major leagues. The group gave home field to the AL for World Series Games 1&2 (scheduled for October 2 & 3) and 6&7, while the NL would host Games 3-5.[15] Each game was to start at 1:30 PM local time.[15]

Some bookmakers made the Yankees a 15-to-1 Series favorite, while others, like New York's top betting commissioners, thought the teams were evenly matched.[16](p66) One The New York Times writer found "little justification for installing either team as the favorite".[17] Regardless of the odds, players from both teams were confident of victory. Hornsby said, "We're going to come through winners. We have the better pitching staff, the better hitters and the greater experience. That's what it takes to win. ... We're going to beat the Yankees. Any of my ball players will tell you that, and we expect to do it." [18] Yankee skipper Miller Huggins retorted,

We're confident we're going to win. It'll be whichever team does the hitting, and we're sure we're going to do it. We're out of our hitting slump. We have a more experienced team and more experienced pitchers. We're about even in the strength of the infields, but ours is steadier. Our outfield is better, stronger and more experienced, and all the boys are cocky and ready to go. There's no doubt in their minds or in mine that the Yankees will win.[19]

[edit] Matchups

[edit] Game 1

Yankee Stadium was filled with 61,658 fans on October 2 for Game 1. Those without tickets gathered at City Hall to watch the game's progress as charted on two large scoreboards.[7](p75) Before the start of the game, United States Senator Robert F. Wagner from New York State threw out the ceremonial first pitch and took his position in the VIP box next to New York City mayor Jimmy Walker. Commissioner Landis and former heavyweight champion of the world Jack Dempsey were also in attendance.[7](p75) Southpaw Bill Sherdel started for Cards, 16-12 with 235 innings pitched in the regular season.[20] The Yanks started Pennock, the team's only 20-game winner that season (as stated above). The future Hall of Fame pitcher, nicknamed "The Knight Of Kennett Square", had a 3.62 ERA in 266.1 innings[21] during the regular season, and had finished third in the American League Most Valuable Player Award balloting behind winner George Burns and runner-up Johnny Mostil.[22]

Taylor Douthitt led off Game 1 with a double to left,[16](p66) advanced to third on Southworth's slow grounder to second baseman]] Tony Lazzeri, stayed there on Hornsby's comebacker right to Pennock but came home on "Sunny Jim" Bottomley's bloop single for the first run of the Series.[23] In the bottom half, Sherdel walked Earle Combs, Babe Ruth and Bob Meusel, to load the bases. Gehrig scored Combs with a fielder's-choice grounder for his first World Series RBI, reaching first ahead of the relay.[7](p75) Card 1, Yanks 1.

In the bottom of the third, Ruth singled and Meusel bunted him over, but Ruth split his pants sliding into second, Radio announcer Graham McNamee exclaiming, "Babe is the color of a red brick house!"[24] Doc Woods, the team's trainer, ran out and sewed up Ruth's pants, much to the amusement of the crowd.[25]

The score was still tied at one apiece in the bottom of the sixth. Just as it began to rain. Ruth lined a single past third baseman Les Bell. Meusel again

sacrificed Ruth to second. Gehrig followed with a single, scoring Ruth and giving the Yanks the lead. Lazzeri lined a shot to left but Gehrig, on a headfirst dive, was tagged out at third by Bell.[7](p76), Lazzeri advancing to second on the throw. Bell bobbled Dugan's grounder for an error to put runners at first and third, but Hank Severeid forced Dugan at second to end the inning. Yanks 2, Cards 1.

In the top of the ninth, Bottomley singled off Pennock but couldn't advance, giving the Yanks a 2nd win in Game 1. Gehrig was their offensive star with both of his team's RBI. Pennock went the distance, striking out four and yielding but three hits, two in the first and one in the ninth.[23] Hard-luck loser Sherdel gave up only two runs and six hits while striking out one.[26]

[edit] Game 2

The second game was played the next day, October 3, at Yankee Stadium in front of a crowd of 63,600.[27] Urban Shocker was the starting pitcher for the Yankees. With 19th wins and 11th losses, Shocker had the second-best pitching record on the team, behind the Game¹ starter, southpaw Herb Pennock. Shocker had a 3.38 ERA in 258th innings, along with 59 strikeouts in the 1926 season.[28] The Cardinals' Game² starter was 39-year-old Grover Cleveland "Old Pete" Alexander, a veteran player in his 16th major league season.[29] That season, he posted numbers considerably lower than the pitching season statistics from his prime in the late 1910s with the Philadelphia Phillies and Chicago Cubs. Alexander had compiled a 12th record in 200th innings, while posting a 3.05 ERA and 48 strikeouts, compared to the nearly 250 strikeouts he had in 1915 with the Phillies.[30]

The Cardinals were first to bat in the game. After giving up a double to Rogers Hornsby, Shocker got a groundout from Jim Bottomley to end the run-scoring threat. In the Yankees' half of the inning, Mark Koenig grounded into a double play, and Babe Ruth followed by striking out. The Cardinals threatened again in the second inning, after back-to-back singles by catcher Bob O'Farrell and shortstop Tommy Thevenow. However, Alexander came to the plate and popped up to Koenig to end the inning. The Yankees scored first in the bottom of the second inning. Bob Meusel hit a single into center field, and Lou Gehrig followed by hitting a grounder to Alexander, which advanced Meusel to second base. Tony Lazzeri then hit a single to left field that scored Meusel from second. Joe Dugan followed with a single of his own, moving Lazzeri to third base. On the following play, Yankees catcher Hank Severeid struck out, and Lazzeri then attempted to steal home plate. Alexander made an error on his throw to catcher Bob O'Farrell, and Lazzeri was able to slide into home plate for the second Yankees run of the inning. O'Farrell then threw the ball to Thevenow, but the tag was late and Dugan was called safe at second base. The inning ended when Alexander struck out Shocker.[31]

In the third inning, Taylor Douthit hit an infield single to shortstop Koenig, and Billy Southworth followed with a single to left field, advancing Douthit to second base. Hornsby laid down a sacrifice bunt to Shocker, moving each runner up a base. Bottomley hit a single into left field, scoring both Douthit and Southworth. The next two batters, Les Bell and Chick Hafey, hit into outs to conclude the inning.[31] In the top of the seventh inning. Bob O'Farrell lined a double, and Tommy Thevenow followed with a single into left field. Pitcher Alexander popped up to Lazzeri, and Douthit followed with a fly ball to left field. Southworth then hit a three-run home run, giving the Cardinals a 5th advantage over the Yankees.[32] Hornsby then grounded out to Koenig to end the inning. Gehrig, Lazzeri and Dugan all grounded out in the bottom of the seventh inning. In the top of the eighth, Bottomley hit a single into right field. Yankees manager Miller Huggins came out of the dugout and took Shocker out of the game, calling in Bob Shawkey from the bullpen to replace him. Shawkey struck out the first two batters he faced, and Bottomley was tagged out after attempting to steal second base. The Yankees could not produce any runs in their half of the inning.[31]

In the ninth inning, Sad Sam Jones, a 22-year veteran in the American League,[33] replaced Dutch Ruether, who had replaced pitcher Shawkey. Jones

gave up an inside-the-park home run to Thevenow. Thevenow had only two other home runs in his career, both of which were inside-the-park and during the 1926 regular season.[34] Jones then walked Douthitt and Hornsby and gave up a single to Southworth. With the bases loaded and two outs in the top of the ninth inning, Bottomley hit a fly ball to center fielder Earle Combs. The Yankees did not score in the bottom of the ninth inning, and lost the game to the Cardinals by a 6â² score.[35](p35) Alexander pitched a complete game, allowed hits in only two of the nine innings and did not allow a Yankee hit after the third inning. He also had a series-high 10 strikeouts, allowing four hits, one earned run and one walk. Meanwhile, the Yankees' starter Shocker allowed ten hits and five earned runs, including a home run, in seven innings of work. Shawkey had a perfect inning with two strikeouts, while Jones gave up two hits and allowed two walks in the ninth inning.[31]

[edit] Game 3

After GameÂ 2 ended on October 3, the Yankees and Cardinals boarded trains to St. Louis, Missouri. The mayor of St. Louis, Victor J. Miller, ordered that the workday end by three the next afternoon so that the city could welcome the Cardinals at Union Station.[7](p76) The Cardinals players were treated like champions by fans and citizens alike. Just outside the station, Mayor Miller stood at a podium and presented club manager and player Rogers Hornsby with a brand new Lincoln sedan priced at US\$4,000[36] and paid for by the city's top businessmen.[7](p76) Each member of the Cardinals' team received a new hat, a new pair of shoes, and an engraved white-gold watch valued at a manufacturer's price of \$100.[7](p76) As the Cardinals were receiving special treatment from the people of St. Louis, fans were lining up outside Sportsman's Park with the hope of being able to purchase tickets to GameÂ 3 for a price of \$3.30.[7](p77)

Sportsman's Park was filled with 37,708Â people on October 5, 1926 for GameÂ 3. On the mound for the Cardinals was right-handed knuckleball pitcher Jesse Haines, a future Baseball Hall of Famer with a 13â⁴ record and 3.25 ERA in 183Â⁴ innings in 1926.[37] Starting for the Yankees was southpaw pitcher Dutch Ruether, who had a 14â⁹ record with a 4.60 ERA in 1926.[38]

The game was rain delayed for 30Â minutes during the top half of the fourth inning. Once the game resumed, the Cardinals came to bat and scored the first runs of the game. Les Bell, a .325 hitter with seventeen home runs that season, led the Cardinals with a single to center field. Chick Hafey dropped a sacrifice bunt straight to Ruether, who then threw it to second baseman Tony Lazzeri. Bell beat Lazzeri's tag at second base and was called safe by the umpire. Bob O'Farrell was walked, and Tommy Thevenow hit a grounder to Lazzeri, who tossed it to Mark Koenig for the force out at second base. Koenig tagged O'Farrell out, but made an error in his throw to first baseman Lou Gehrig, which resulted in a run. Then, Haines hit a Ruether pitch for a two-run home run.[39]

The Cardinals were leading the Yankees 3â⁰ by the end of the inning. The Yankees failed to produce any offense in the fifth inning, but the Cardinals added to their lead by picking up a run when Billy Southworth beat the tag at home following a Jim Bottomley grounder to second base. Ruether was then replaced by Bob Shawkey, who closed out the inning by yielding two weak infield groundouts. The Yankees picked up one hit in each of the next two innings, but could not produce any runs. Yankees pitcher Myles Thomas came in to pitch a hitless ninth inning. With one out in the bottom of the ninth inning, Lou Gehrig hit a line drive single into right field, but Lazzeri grounded into a double play, ending the game as a 4â⁰ Cardinals victory. Haines pitched a complete game shutout, and only gave up five hits total, two of which came from Gehrig.[39]

[edit] Game 4

Future Baseball Hall of Famer Waite Hoyt started GameÂ 4 for the Yankees at Sportsman's Park on October 6, 1926. Hoyt had a 16â¹² record with a 3.85 ERA in 218Â⁴ innings for the 1926 season. This was Hoyt's fourth World Series with the New York Yankees, and he entered the 1926 Series with over 35Â⁴ innings of pitching experience in the championship series.[40] He was opposed by Flint

Rhem, the Cardinals' 20-game winner who had led the team with both a .741 winning percentage and 258¹ innings pitched.[27][41]

In the first inning, after striking out Earle Combs and Mark Koenig, Rhem gave up a solo home run to Babe Ruth. Bob Meusel was then walked, but was tagged out at home after attempting to score on a Lou Gehrig single. The Cardinals came into the bottom of the first with two straight singles to put runners at first and third base. Rogers Hornsby singled in Taylor Douthit to tie the game at 1¹ and moved Billy Southworth to second base. Jim Bottomley flied out to left field, and Les Bell followed with a sacrifice fly to center fielder Combs. With the go-ahead run at third base, Hornsby stole second, but Chick Hafey struck out to end the Cardinals' run-scoring threat. Two innings later, Ruth came up to the plate with two outs and hit Rhem's pitch for a solo home run, his second of the game. Gehrig led off the next inning with a strikeout. Tony Lazzeri followed with a walk, and Joe Dugan hit a run-scoring double. Catcher Hank Severeid hit a single into center field, and Dugan ran towards home. He was tagged out at the plate by catcher Bob O'Farrell. The Yankees' starter Hoyt struck out to end the inning.[42]

The Cardinals responded by scoring three runs in the bottom of the fourth inning. With one out and no runners on the bases, Hafey hit a single. O'Farrell followed and hit a ground ball towards Koenig that he bobbled, enabling O'Farrell and Hafey to reach first and second base, respectively. Tommy Thevenow followed with a double to right field that got by Meusel, scoring Hafey and moving O'Farrell to third base. Cardinals' manager Rogers Hornsby then put in left-handed infielder Specs Toporczer to pinch-hit for Rhem, who was done pitching for the game. Toporczer hit a fly ball to Earle Combs in center field, upon which O'Farrell promptly tagged up to score another Cardinal run. With the game tied at three apiece and a runner at second base, Douthit hit a double in the outfield, which scored Thevenow. Southworth followed with a single to left fielder Ruth, and Douthit immediately tried to score. Ruth threw from left field to catcher Hank Severeid, who tagged Douthit out at home plate.[42]

To start the top of the fifth inning, Art Reinhart was put in as pitcher. Reinhart walked Combs and followed by giving up a run-scoring double to Koenig. He then walked Ruth and Meusel in succession to load the bases for Gehrig. Reinhart walked Gehrig, allowing Koenig to score and keeping the bases loaded with no outs. Hi Bell replaced Reinhart as pitcher, but he was not able to suppress the Yankees' offense. Lazzeri hit a sacrifice fly to right field, which scored Ruth and moved Meusel up to third base. Dugan then hit a weak groundball; he was thrown out at first by catcher O'Farrell, but Meusel scored and Gehrig went to second base. Bell then balked, moving Gehrig to third base. Severeid was walked, and pitcher Hoyt ended the inning by hitting into a force play at second base.[42]

The Yankees expanded on their three-run lead in the next inning. After the entire Yankees lineup batted in the fifth inning, Combs was back at the plate to start the sixth. Combs hit an infield single past shortstop Thevenow. Koenig followed by striking out. Ruth, with two home runs already in the game, came up to the plate. The count on Ruth went up to three balls and two strikes before he hit a long home run. Ruth's three home runs was a feat equaled only thrice since.[5][43] As one of the game announcers (either McNamee or Carlin)[44](pp337¹ ^338)[45] described the situation:

The Babe is up. Two home runs today. One ball, far outside. Babe's shoulders look as if there is murder in them down there, the way he is swinging that bat down there. A high foul into the left-field stands. That great big bat of Babe's looks like a toothpick down there, he is so big himself. Here it is. Babe shot a bad one and fouled it. Two strikes and one ball. The outfield have all moved very far towards right. It is coming up now. A little too close. Two strikes and two balls. He has got two home runs and a base on balls so far today. Here it is, and a ball. Three and two. The Babe is waving that wand of his over the plate. Bell is loosing up his arm. The Babe is hit clear into the

center-field bleachers for a home run! For a home run! Did you hear what I said? Where is that fellow who told me not to talk about Ruth anymore? Send him up here. Oh what a shot! Directly over second. The boys are all over him over there. One of the boys is riding on Ruth's back. Oh, what a shot! Directly over second base far into the bleachers out in center field, and almost on a line and then that dumbell, where is he, who told me not to talk about Ruth! Oh, boy! Not that I love Ruth, but oh, how I love to see a shot like that! Wow! That is a world's series record, three home runs in one world's series game and what a home run! That was probably the longest hit ever in Sportsman's Park. They tell me this is the first ball ever hit in the center-field stand. That is a mile and half from here. You know what I mean.[44](pp337â ^338)

It was measured at over 430 feet (130Â m) and had cleared the 20 feet (6.1Â m) wall in center field, crashing through the window of an auto dealer across the street from the stadium.[34] Locals claimed it was the longest home run ever hit in St. Louis.[7](p77) Meusel then hit a single in right field, but was tagged out as he tried to head for second base. Gehrig followed with a double to the opposite side, but could not score when Lazzeri popped up to Thevenow to end the inning.[42]

In the seventh inning, the Yankees faced a new pitcher, this time a southpaw named Bill Hallahan, who served as both a starter and reliever for the Cardinals. After Severeid singled and subsequently advanced on a sacrifice bunt by Hoyt, he scored on a double hit into left field by Combs. The Yankees led 10â ^4 and did not get any more runs or hits in the eighth or ninth inning. The Cardinals came up to bat in the bottom of the ninth inning with Hoyt trying to hold on to his six-run lead. Hornsby singled to right field and advanced to second base on the following play. He then ran home to score a run on a Les Bell single to center field. Hafey then popped up in foul territory, and Severeid made the catch. The game ended with a 10â ^5 score. Waite Hoyt pitched a complete game, allowing two earned runs on 14 hits while striking out eight batters. The Cardinals' five pitchers combined to give up 10 Yankee runs and 14 hits.[42] With the series tied at two games apiece, both teams anticipated GameÂ 5, which featured a rematch between Herb Pennock and Bill Sherdel.[27]

[edit] Babe Ruth and Johnny Sylvester

The 1926 World Series produced one of the most famous anecdotes in baseball history, involving Babe Ruth and Johnny Sylvester. Sylvester was an 11-year-old boy from Essex Fells, New Jersey, who was supposedly hospitalized after falling off a horse. Sylvester asked his father to get him a baseball autographed by Babe Ruth. Prior to the start of the World Series, the boy's parents sent urgent telegrams to the Yankees in St. Louis, asking for an autographed ball. Soon, the family received an airmail package with two balls, one autographed by the entire St. Louis Cardinals team and the other with signatures from a number of Yankees players and a personal message from Ruth saying, "I'll knock a homer for you on Wednesday".[46] After Ruth hit three home runs in GameÂ 4 on Wednesday, October 6, newspapers reported that Sylvester's condition had miraculously improved. After the World Series had ended, Ruth made a highly publicized visit to Sylvester's home, in which the boy said to Ruth, "I'm sorry the Yanks lost the series".[47] In the spring of 1927, Sylvester's uncle visited Ruth and thanked him for saving the boy's life. Ruth asked how the boy was doing and asked the uncle to give the boy his regards. After the man left, Ruth, who was seated next to a group of baseball writers, said, "Now who the hell is Johnny Sylvester?"[7](p81)[48]

There have been many alternate versions of this event. One version, which was later portrayed in The Babe Ruth Story, claims that Ruth went to Sylvester's hospital bed and promised him in person that he would hit a home run for him. On October 9, Ruth followed up on Sylvester and told him he would "try to knock you another homer, maybe two today".[46] Differing newspaper reports from October 1926 claimed that Sylvester suffered from blood poisoning, a spinal infection, a sinus condition, or had a condition requiring a spinal fusion. Contemporary analyses dispute whether Sylvester was ever hospitalized, dying,

or if Ruth's three home runs had actually saved the boy's life, as claimed by the newspapers.[46]

[edit] Game 5

Game 5, played at Sportsman's Park in St. Louis on October 7, featured a rematch between Game 1 starters Herb Pennock and Bill Sherdel. Pennock had pitched a complete game three-hitter in the 2nd Yankees victory, while Sherdel had pitched seven innings, giving up two runs and six hits.[23]

Through the first three innings of the fourth game, both pitchers held the opposing team to no runs and a limited number of hits. In the bottom of the fourth inning, the Cardinals cracked through Pennock's tough pitching. Jim Bottomley began by hitting a one-out double past left fielder Babe Ruth. Les Bell followed with a single to right field, scoring Bottomley. Chick Hafey then hit a fly ball caught in foul territory by Ruth, and Bell was called out while attempting to steal second base. In the top of the sixth inning, Pennock hit a line drive double into left field past Hafey. Cardinals' catcher Bob O'Farrell threw to Tommy Thevenow in hopes of picking off Pennock, who was standing a considerable distance away from second base. Thevenow made an error with his tag on Pennock, and Pennock was safe at second base. Earle Combs, the Yankees leadoff hitter, followed by drawing a walk. With runners at first and second base, Koenig hit a single to left fielder Hafey. Pennock scored on the play, and Combs moved to second base. Ruth then struck out, and Bob Meusel followed by hitting a sacrifice fly to right fielder Billy Southworth, on which Combs promptly advanced to third base. Lou Gehrig drew a walk to load the bases for Tony Lazzeri, who ended the inning by hitting a fly ball to center fielder Wattie Holm.[49]

The Cardinals came back to take the lead in the bottom of the seventh inning. Bell led the inning by hitting a double into left field. After a Hafey fly out, O'Farrell hit a single to Ruth in left field, and Bell ran from second base to home to score the run and give the Cardinals a 2nd advantage. In the top of the ninth inning, the Yankees tied up the game. Gehrig lined a double to left field, and Lazzeri bunted a single, advancing Gehrig to third base. Ben Paschal went in as a pinch-hitter for Joe Dugan and singled into center field, scoring Gehrig and advancing Lazzeri to second base. Severeid laid down a weak bunt, and Cardinals catcher O'Farrell threw to third base to make the force out on Lazzeri. With runners at first and second base, Pennock hit a groundball to shortstop Thevenow, who tossed it to second base to get the force out on Severeid. With Pennock at first base and Paschal at third base, Combs grounded to second base, ending the Yankees' hope of taking the lead. The Cardinals could not break the 2nd tie in the bottom of the ninth inning, so the game went into extra innings.[49]

The Yankees immediately took advantage of Sherdel in the top of the tenth inning. Koenig led things off by singling into left field. Sherdel threw a wild pitch to Ruth, and Koenig advanced to second base. Ruth then walked, and Meusel followed with a sacrifice bunt straight to pitcher Sherdel. Meusel was out at first, but Ruth and Koenig were safe at second and third base, respectively. Gehrig was intentionally walked, loading the bases. Lazzeri hit a fly ball to left field, and Koenig tagged up on the play to score a run and give the Yankees a one-run lead. Mike Gazella, in place of Joe Dugan at third base, was hit by a pitch from Sherdel. With the bases loaded again, Severeid popped up to second baseman Rogers Hornsby to end the Yankee rally. The Cardinals got a single from Thevenow in the bottom of the tenth inning, but they could not score any runs. The game ended with the Yankees winning by a score of 3rd 2. Both Pennock and Sherdel pitched ten-inning complete games. Sherdel gave up nine hits and two earned runs, while walking five and striking out two. Pennock finished the game giving up just seven hits and two runs, while striking out four batters.[49]

[edit] Game 6

The teams moved back to Yankee Stadium for Game 6. Over 48,000 fans came into Yankee Stadium on October 9 to see if the Yankees could win their second World Series in franchise history. The game's pitching matchup was between Grover

Cleveland Alexander and Bob Shawkey, both of whom had made appearances in previous games in the series. Shawkey had come in as relief in Games 2 and 3, while Alexander had pitched a complete game against the Yankees in the Cardinals' Game 2 victory.[27] In the 1926 season, Shawkey had made most of his pitching appearances in relief, and had been an occasional starter on the Yankees rotation. He started 10 of his 29 total pitching appearances and posted an 8⁷ record with a 3.62 earned run average.[50]

The game was lopsided from the start. In the top of the first inning, Shawkey gave up three runs on three hits, with the runs coming from a Jim Bottomley double and Les Bell single. Alexander encountered a minor setback in the fourth inning. To open up the bottom of the inning, Bob Meusel launched a triple into left field and scored on the following ground out by Lou Gehrig. Alexander shut down the Yankees for the rest of the inning, and the Cardinals held on to a 3¹ lead. In the top of the fifth inning, the Cardinals expanded their two-run lead. Tommy Thevenow hit a single to left fielder Babe Ruth. Alexander laid down a sacrifice bunt and was tagged out by first baseman Gehrig, but was successful in advancing Thevenow to second base. Wattie Holm, substituting for Taylor Douthitt as center fielder, followed by hitting a single into center field, scoring Thevenow on the play. Billy Southworth and Rogers Hornsby followed with groundouts in the infield to end the inning.[51]

The Cardinals scored again in the top of the seventh inning. Thevenow again led the inning by hitting a single into left field. Alexander bunted right in front of the plate. Yankees catcher Hank Severeid made the throw to second baseman Tony Lazzeri, but Lazzeri made an error on the play, and both runners were safe at their respective bases. Holm followed by hitting a weak grounder that led to a force out of Thevenow at third base. With runners at first and second base, Southworth lined a double right by Ruth, scoring Alexander and sending Holm to third base. Urban Shocker, the starter in Game 2, then came in to relieve Shawkey as pitcher. Shocker gave up a single to Hornsby into center field, allowing Holm and Southworth to score. Bottomley then hit a grounder to shortstop Mark Koenig, who stepped on second base to get Hornsby out on the force play. Bell followed with a two-run home run, extending the Cardinals' lead to 9¹. Chick Hafey lined a double into left field, but Bob O'Farrell ended the inning by striking out. In the bottom of the seventh inning, the Yankees scored one run on an Earle Combs single to cut the Cardinals' lead to seven runs.[51]

In the eighth inning, Myles Thomas came in to relieve Shocker, who had given up three hits and two unearned runs in less than an inning of work. Meanwhile, Alexander shut down the Yankees offense for the rest of the game. In the top of the ninth inning, the Cardinals increased their lead back to eight runs after Hornsby had an RBI groundout, scoring Southworth. Alexander finished with his second complete game of the series and gave up only two runs on eight hits, while striking out six batters. The three Yankee pitchers combined to give up thirteen hits, seven earned runs, three unearned runs, and one home run.[51]

[edit] Game 7

The deciding Game 7 was played on October 10, 1926, at Yankee Stadium in front of a crowd of 38,093¹ people. The game featured two future Baseball Hall of Famers, who were both winners in their respective pitching appearances earlier in the series. Jesse Haines took to the mound for the Cardinals; he had pitched in relief in Game 1 and threw a complete game shutout against the Yankees in Game 3. Waite Hoyt had pitched a complete game 10⁵ Yankees victory in Game 4.[42]

The Yankees scored the first run of the game in the third inning on a Babe Ruth solo home run into the right field bleachers.[35](p35) In the following half inning, the Cardinals came back to take a 3¹ lead over the Yankees. Jim Bottomley lined a one-out single into left field to start the Cardinals' fourth inning rally. Les Bell just barely made it to first base after shortstop Mark Koenig accidentally kicked the ball while trying to field it. With runners at first and second base, Chick Hafey hit a bloop single into left field, which loaded up the bases for catcher Bob O'Farrell. This time, left fielder Bob

Meusel made an error by dropping O'Farrell's fly ball, so Bottomley scored to tie the game, and the bases remained loaded. Tommy Thevenow followed with a two-run single to right fielder Ruth. Haines struck out the next batter, and Wattie Holm hit into a force play at second base.[52] All three runs in the inning were charged as unearned on Hoyt, due to the two Yankee errors.

In the sixth inning, the Yankees cut the Cardinals lead. With two outs, Joe Dugan hit a single. Hank Severeid followed with a double, scoring Dugan, before pinch-hitter Ben Paschal grounded to Haines to end the inning. Game's 1 and 5 winner Herb Pennock came in relief for Hoyt in the seventh inning. He yielded only one hit in the inning and limited the Cardinals to their 3-2 lead. In the bottom half of the inning, the Yankees loaded up the bases with Earle Combs, Ruth and Lou Gehrig. At this point, there were two outs, and Haines had developed a blister on his pitching hand, and could no longer pitch in the game.[53](p118)

Rogers Hornsby had to determine who he would put in to replace Haines as pitcher. Although Grover Cleveland Alexander had pitched a complete game the day before and may have spent the night drinking,[54] Hornsby decided to trust him after Alexander said he "had it in easy in there" in Game's 6[53](p118) and would be ready whenever Hornsby needed him. The first two pitches thrown by Alexander to batter Tony Lazzeri went for a strike and a ball, respectively. On the third pitch, Lazzeri hit a fly ball down the left field line. The ball initially appeared to be going into the stands for a grand slam, but at the last minute, it curved several feet into the stands in foul territory.[53](p119) Alexander then threw a fastball that Lazzeri swung late at and missed for strike three, ending the inning and the Yankees' threat.

Alexander retired the Yankees in order in the eighth inning. The Cardinals did nothing offensively in the top of the ninth inning, so it was up to Alexander to preserve the Cardinals' game in the bottom of the ninth.[53](p119) Alexander got the first two batters of the inning, Combs and Dugan, to ground out to third baseman Bell. With two outs and no runners on base, Alexander faced Ruth. Ruth had hit a solo home run and walked three times in the game. Manager Hornsby walked to the mound to talk with Alexander. Alexander told Hornsby that he would rather face Ruth than intentionally walk him. Alexander's first pitch to Ruth fell in for a solid strike in the middle of the plate. Alexander's next pitch fell outside of the strike zone for ball one. Ruth then fouled the next pitch, making the count one ball and two strikes. Alexander's next two pitches fell too low for balls two and three, making it a full count.[35](p37) The following full count pitch was noted by New York Herald Tribune sportswriter W. O. McGeehan: "The count went to three and two, Ruth was swaying eagerly. The soupbone creaked again. The ball seemed a fraction of an inch from being a strike. Ruth paused a moment. Even he was uncertain. Then he trotted down to first." [53](p119)

With two outs and Ruth at first base, left fielder Bob Meusel came up to the plate. Meusel was a .315 hitter that year and had batted in 81 runs in just over 100 regular season games. Meusel also had success in Game's 6 against Alexander, with a double and triple.[53](p119) Just as Meusel was about to take his first pitch, Ruth made the bold move of trying to steal second base. Ruth was known as a good but overly aggressive baserunner, with about a 50% success rate at stealing bases in his career, and his attempt surprised many people throughout the stadium.[7](p80) Meusel swung and missed at the pitch, and Cardinals catcher Bob O'Farrell immediately threw the ball to second baseman Hornsby. Hornsby reached for the ball, and laid the tag immediately on Ruth. Ruth was out by a good 10 feet (3.0 m), and the game was over. As the game announcer described it, "Ruth is walked again for the fourth time today. One strike on Bob Meusel. Going down to second! The game is over! Babe tried to steal second and is put out catcher to second!" [44](p340)

As Hornsby recalled later, Ruth "didn't say a word. He didn't even look around or up at me. He just picked himself up and walked away".[53](p119) Ruth's failed attempt to steal second base ended the game and the 1926 World Series; it is, as of 2012, the only time a World Series has ended with a runner being

caught stealing.[55] Ruth explained later that he attempted to steal second base because he thought no one would expect it. He hoped that by getting to second base, he could have an easier chance at scoring if Meusel hit a single into the outfield.[7](p80)

The Cardinals went back home to St. Louis to a rapturous fan reception, having won their first undisputed world championship. Each member of the championship team collected \$5,584.51, while the Yankees' players were given \$3,417.75 each.[16](p71)

[edit] Series statistics

NL St. Louis Cardinals (4) vs. AL New York Yankees (3)

Game

Date

Score

Location

Time

Attendance

1

October 2

St. Louis Cardinals @ 1, New York Yankees @ 2

Yankee Stadium (I)

1:48

61,658[23]

2

October 3

St. Louis Cardinals @ 6, New York Yankees @ 2

Yankee Stadium (I)

1:57

63,600[31]

3

October 5

New York Yankees @ 0, St. Louis Cardinals @ 4

Sportsman's Park (III)

1:41

37,708[39]

4

October 6

New York Yankees @ 10, St. Louis Cardinals @ 5

Sportsman's Park (III)

2:38

38,825[42]

5

October 7

New York Yankees @ 3, St. Louis Cardinals @ 2 (10 innings)

Sportsman's Park (III)

2:28

39,552[49]

6

October 9

St. Louis Cardinals @ 10, New York Yankees @ 2

Yankee Stadium (I)

2:05

48,615[51]

7

October 10

St. Louis Cardinals @ 3, New York Yankees @ 2

Yankee Stadium (I)

2:15

38,093[52]

Team

1

2
3
4
5
6
7
8
9
10
R
H
E
St. Louis Cardinals
5
0
2
10
2
0
9
0
3
0
31
65
5
New York Yankees
2
2
2
2
4
5
2
0
1
1
21
54
7

Total attendance: 328,051[56] Average attendance: 46,864
Winning player's share: \$5,585[16](p71) Losing player's share: \$3,418[34]

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[edit] External links

Tosca (Italian pronunciation:âˆ’ [tÉ’ska]) is an opera in three acts by Giacomo Puccini to an Italian libretto by Luigi Illica and Giuseppe Giacosa. It premiered at the Teatro Costanzi in Rome on 14 January 1900. The work, based on Victorien Sardou’s 1887 French-language dramatic play, *La Tosca*, is a melodramatic piece set in Rome in June 1800, with the Kingdom of Naples’s control of Rome threatened by Napoleon’s invasion of Italy. It contains depictions of torture, murder and suicide, yet also includes some of Puccini’s best-known lyrical arias, and has inspired memorable performances from many of opera’s leading singers.

Puccini saw Sardou’s play when it was touring Italy in 1889 and, after some vacillation, obtained the rights to turn the work into an opera in 1895. Turning the wordy French play into a succinct Italian opera took four years, during which the composer repeatedly argued with his librettists and publisher. *Tosca* premiered at a time of unrest in Rome, and its first performance was delayed for a day for fear of disturbances. Despite indifferent reviews from the critics, the opera was an immediate success with the public.

Musically, *Tosca* is structured as a through-composed work, with arias, recitative, choruses and other elements musically woven into a seamless whole. Puccini used Wagnerian leitmotifs (short musical statements) to identify characters, objects and ideas. While critics have frequently dismissed the opera as a facile melodrama with confusions of plotâˆ’musicologist Joseph Kerman famously called it a "shabby little shocker"âˆ’the power of its score and the inventiveness of its orchestration have been widely acknowledged. The dramatic force of *Tosca* and its characters continues to fascinate both performers and audiences, and the work remains one of the most frequently performed operas. Many recordings of the work have been issued, both of studio and live performances.

[edit] Background

The French playwright Victorien Sardou wrote more than 70 plays, almost all of them successful, and none of them performed today.[1] In the early 1880s Sardou began a collaboration with the immensely popular actress Sarah Bernhardt, whom he provided with a series of historical melodramas.[2] He reached his greatest glory with the third Bernhardt play, *La Tosca*, which premiered in Paris on 24âˆ’November 1887, and in which she starred throughout Europe.[3] The play was an outstanding success, with more than 3,000 performances in France alone.[4]

Puccini had seen *La Tosca* at least twice, in Milan and Turin. On 7âˆ’May 1889 he wrote to his publisher, Giulio Ricordi, begging him to get Sardou’s permission for the work to be made into an opera: "I see in this *Tosca* the opera I need, with no overblown proportions, no elaborate spectacle, nor will it call for the usual excessive amount of music." [5] Ricordi sent his agent in Paris, Emanuele Muzio, to negotiate with Sardou, who preferred that his play be adapted by a French composer. He complained about the reception *La Tosca* had received in Italy, particularly in Milan, and also warned that other composers were interested in the piece.[6] Nonetheless, Ricordi reached terms with Sardou, and assigned the librettist Luigi Illica to write a scenario for an adaptation.[7] In 1891, however, Illica advised Puccini against the project, most likely because he felt the play could not be successfully adapted to a musical

form.[8] When Sardou indicated his unease at entrusting his most successful work to the as-yet-unproven Puccini, whose music he did not like, Puccini took offence. He withdrew from the agreement,[9] which Ricordi then assigned to Alberto Franchetti.[7]

Illica wrote a libretto for Franchetti who, however, was never at ease with the assignment. There are several versions of how Ricordi got Franchetti to surrender the rights so he could recommission Puccini, who had again become interested.[10] By some accounts, Ricordi convinced Franchetti that the work was too violent to be successfully staged. Franchetti family tradition holds that Franchetti gave the work back as a grand gesture, "He has more talent than I do." [7] American scholar Deborah Burton contends that Franchetti gave it up simply because he saw little merit in it and could not feel the music in the play.[7] Franchetti surrendered the rights in May 1895, and in August Puccini signed a contract to resume control of the project.[10]

Role

Voice type

Premiere cast, 14 January 1900[11]

(Conductor: Leopoldo Mugnone)[12]

Floria Tosca, a celebrated singer

soprano

Hariclea Darclãe

Mario Cavaradossi, a painter

tenor

Emilio De Marchi

Baron Scarpia, chief of police

baritone

Eugenio Giraldoni

Cesare Angelotti, former Consul of the Roman Republic

bass

Ruggero Galli

A Sacristan

baritone

Ettore Borelli

Spoletta, a police agent

tenor

Enrico Giordano

Sciarrone, a gendarme

bass

Giuseppe Gironi

A Jailer

bass

Aristide Parassani

A Shepherd boy

alto

Angelo Righi

Soldiers, police agents, altar boys, noblemen and women, townsfolk, artisans

[edit] Synopsis

[edit] Historical context

According to the libretto, the action of Tosca occurs in Rome in June 1800.[13] Sardou, in his play, dates it more precisely; La Tosca takes place in the afternoon, evening, and early morning of 17 and 18 June 1800.[14]

Italy had long been divided into a number of small states, with the Pope in Rome ruling the Papal States in the area of central Italy. Following the French Revolution, a French army under Napoleon invaded Italy in 1796, entering Rome almost unopposed on 11 February 1798 and establishing a republic there.[15] This republic was ruled by seven consuls; in the opera this is the former office of Angelotti, whose character may be based on the real-life consul Libero Angelucci.[16] In September 1799 the French, who had protected the republic, withdrew from Rome.[17] As they left, troops of the Kingdom of Naples occupied the city.[18]

In May 1800 Napoleon, by then the unquestioned leader of France, brought his troops across the Alps to Italy once again. On 14th June his army met the Austrian forces at the Battle of Marengo (near Alessandria). Austrian troops were initially successful; by mid-morning they were in control of the field of battle, and their commander, Michael von Melas sent this news south towards Rome. However, fresh French troops arrived in late afternoon, and Napoleon attacked the tired Austrians. As Melas retreated in disarray with the remains of his army, he sent a second courier south with the revised message.[19] The Neapolitans abandoned Rome,[20] and the city spent the next fourteen years under French domination.[21]

Inside the church of Sant'Andrea della Valle

Cesare Angelotti, former consul of the Roman Republic and now an escaped political prisoner, runs into the church and hides in the Attavanti private chapel ~ his sister, the Marchesa Attavanti, has left a key to the chapel hidden at the feet of the statue of the Madonna. The elderly Sacristan enters and begins cleaning. The Sacristan kneels in prayer as the Angelus sounds. The painter Mario Cavaradosi arrives to continue work on his picture of Mary Magdalene. The Sacristan identifies a likeness between the portrait and a blonde-haired woman who has been visiting the church recently (unknown to him, it is Angelotti's sister the Marchesa). Cavaradosi describes the "hidden harmony" ("Recondita armonia") in the contrast between the blonde beauty of his painting and his dark-haired lover, the singer Floria Tosca. The Sacristan mumbles his disapproval before leaving.

Angelotti emerges and tells Cavaradosi, an old friend who has republican sympathies, that he is being pursued by the Chief of Police, Baron Scarpia. Cavaradosi promises to assist him after nightfall. Tosca's voice is heard, calling to Cavaradosi. Cavaradosi gives Angelotti his basket of food and Angelotti hurriedly returns to his hiding place. Tosca enters and suspiciously asks Cavaradosi what he has been doing ~ she thinks that he has been talking to another woman. Cavaradosi reassures her and Tosca tries to persuade him to take her to his villa that evening: "Non la sospiri, la nostra casetta" ("Do you not long for our little villa"). She then expresses jealousy over the woman in the painting, whom she recognises as the Marchesa Attavanti. Cavaradosi explains the likeness; he has merely observed the Marchesa at prayer in the church. He reassures Tosca of his fidelity and asks her what eyes could be more beautiful than her own: "Qual'occhio al mondo" ("What eyes in the world"). After Tosca has gone, Angelotti reappears, and discusses with the painter his plan to flee disguised as a woman, using clothes left in the chapel by his sister. Cavaradosi gives Angelotti a key to his villa, suggesting that he hide in a disused well in the garden.

The sound of a cannon signals that Angelotti's escape has been discovered. As he and Cavaradosi rapidly leave the church the Sacristan re-enters with choristers, celebrating the news that Napoleon has apparently been defeated at Marengo. The celebrations cease abruptly with the entry of Scarpia, his henchman Spoletta and several police agents, who are searching for Angelotti. They have heard that he has sought refuge in the church. A search is ordered, and the empty food basket and a fan bearing the Attavanti coat of arms are found in the chapel. Scarpia questions the Sacristan, and his suspicions are aroused further when he learns that Cavaradosi has been in the church; Scarpia mistrusts the painter, and believes him complicit in Angelotti's escape. When Tosca arrives looking for her lover, Scarpia artfully arouses her jealous instincts by implying a relationship between the painter and the Marchesa Attavanti. He draws Tosca's attention to the fan and suggests that someone must have surprised the lovers in the chapel. Tosca falls for his deceit; enraged, she rushes off to confront Cavaradosi. Scarpia orders Spoletta and his agents to follow her, assuming she will lead them to Cavaradosi and Angelotti. He privately gloats as he reveals his intentions to possess Tosca and execute Cavaradosi. A procession enters the church singing the Te Deum; exclaiming 'Tosca, you make me forget even God!', Scarpia joins the chorus in the prayer. Scarpia's apartment in the Palazzo Farnese, that evening

Scarpia, at supper, sends a note to Tosca asking her to come to his apartment. He has been unable to find Angelotti, but has arrested Cavaradossi. Cavaradossi is brought in and, as he is questioned, the voice of Tosca, singing in a celebratory cantata in another room in the Palace, can be heard. Cavaradossi denies knowing anything about the escape of Angelotti. Tosca arrives, just in time to see her lover taken to an antechamber to be tortured. He is able to speak briefly with her, telling her to say nothing. Tosca is told by Scarpia that she can save her lover from indescribable pain if she reveals Angelotti's hiding place. She resists, but hearing Cavaradossi's cries of pain, eventually tells Scarpia that Angelotti is in the well in the garden of Cavaradossi's villa.

Scarpia orders the torture of Cavaradossi to cease and the wounded painter is brought back in. He recovers consciousness and, learning of Tosca's betrayal, is furious with her. Sciarrone, a police agent, enters with news of Napoleon's victory at Marengo; Cavaradossi gloats, telling Scarpia that his rule of terror will soon be at an end, before being dragged away by Scarpia's men. Scarpia, left with Tosca, proposes a bargain: if she gives herself to him, Cavaradossi will be freed. She is revolted, and repeatedly rejects his advances. Outside she hears the drums that announce an execution; as Scarpia awaits her decision, she prays to God for help, asking why He has abandoned her: "Vissi d'arte" ("I lived for art"). Scarpia remains adamant despite her pleas. When Spoletta brings news that Angelotti has killed himself and that everything is in place for Cavaradossi's execution, Tosca, in despair, agrees to submit to Scarpia in return for Cavaradossi's freedom. Scarpia tells his deputy Spoletta to arrange a mock execution, both recalling that it will be "as we did with Count Palmieri".

Following Spoletta's departure, Tosca imposes the further condition that Scarpia provide a safe-conduct out of Rome for herself and her lover. While he is signing the document, Tosca quietly takes a knife from the supper table. As Scarpia triumphantly embraces her, she stabs him, crying "this is Tosca's kiss!". As Scarpia falls dead, she declares that she now forgives him. She removes the safe-conduct from his pocket, lights candles in a gesture of piety and places a crucifix on the body before leaving.

The upper parts of the Castel Sant'Angelo, early the following morning

A shepherd boy sings (in Romanesco dialect) "Io de' sospiri" ("I give you sighs") as church bells sound for matins. Cavaradossi is led in by guards and informed that he has one hour to live. He refuses to see a priest, but asks permission to write a letter to Tosca. He begins to write, but is soon overwhelmed by memories: "E lucevan le stelle" ("And the stars shone"). Tosca enters and shows him the safe-conduct. She tells him that she has killed Scarpia and that the imminent execution is a sham: Cavaradossi must feign death, but afterwards they can leave Rome together, before Scarpia's body is discovered. Cavaradossi is amazed at the courage shown by one so gentle and tender: "O dolci mani" ("Oh sweet hands"). The pair ecstatically plan the life they will live away from Rome. Tosca then anxiously instructs Cavaradossi on how to play his part in the mock execution convincingly. She tells him that he will be shot with blanks by the firing squad and instructs him to fall down as if dead. He agrees to act "like Tosca in the theatre".

Cavaradossi is led away, and Tosca watches with increasing impatience as the execution is prepared. The men fire, Cavaradossi falls, and Tosca exclaims "Ecco un artista!" ("What an actor!"). When the soldiers have all left, she hurries towards Cavaradossi, only to find that he is dead; Scarpia has betrayed her. Heartbroken, she clasps his lifeless body and weeps. The voices of Spoletta, Sciarrone and soldiers are heard, indicating that Scarpia's body has been found, and that Tosca is known to have killed him. As Spoletta, Sciarrone and the soldiers rush in, Tosca rises, evades their clutches, and runs to the parapet. Crying "O Scarpia, Avanti a Dio!" ("O Scarpia, we meet before God!"), she hurls herself over the edge to her death.

[edit] Adaptation and writing

Sardou's five-act play *La Tosca* contains a large amount of dialogue and

exposition. While the broad details of the play are present in the opera's plot, the original work contains many more characters and much detail not present in the opera. In the play the lovers are portrayed as though they were French: the character Floria Tosca is closely modelled on Bernhardt's personality, while her lover Cavaradossi, of Roman descent, is born in Paris. Illica and Giuseppe Giacosa, the playwright who joined the project to polish the verses, needed not only to cut back the play drastically, but to make the characters' motivations and actions suitable for Italian opera.[22] Giacosa and Puccini repeatedly clashed over the condensation, with Giacosa feeling that Puccini did not really want to complete the project.[23]

The first draft libretto that Illica produced for Puccini resurfaced in 2000 after being lost for many years. It contains considerable differences from the final libretto, relatively minor in the first two acts but much more appreciable in the third, where the description of the Roman dawn that opens the third act is much longer, and Cavaradossi's tragic aria, the eventual "E lucevan le stelle", has different words. The 1896 libretto also offers a different ending, in which Tosca does not die but instead goes mad. In the final scene, she cradles her lover's head in her lap and hallucinates that she and her Mario are on a gondola, and that she is asking the gondolier for silence.[24] Sardou refused to consider this change, insisting that as in the play, Tosca must throw herself from the parapet to her death.[25] Puccini agreed with Sardou, telling him that the mad scene would have the audiences anticipate the ending and start moving towards the cloakrooms. Puccini pressed his librettists hard, and Giacosa issued a series of melodramatic threats to abandon the work.[26] The two librettists were finally able to give Puccini what they hoped was a final version of the libretto in 1898.[27]

Little work was done on the score during 1897, which Puccini devoted mostly to performances of *La bohème*. [27] The opening page of the autograph *Tosca* score, containing the motif that would be associated with Scarpia, is dated January 1898.[28] At Puccini's request, Giacosa irritably provided new lyrics for the act 1 love duet. In August, Puccini removed several numbers from the opera, according to his biographer, Mary Jane Phillips-Matz, "cut[ting] *Tosca* to the bone, leaving three strong characters trapped in an airless, violent, tightly wound melodrama that had little room for lyricism".[29] At the end of the year, Puccini wrote that he was "busting his balls" on the opera.[29]

Puccini asked clerical friends for words for the congregation to mutter at the start of the act 1 *Te Deum*; when nothing they provided satisfied him, he supplied the words himself.[29] For the *Te Deum* music, he investigated the melodies to which the hymn was set in Roman churches, and sought to reproduce the cardinal's procession authentically, even to the uniforms of the Swiss Guards.[26] He adapted the music to the exact pitch of the great bell of St. Peter's Basilica,[30] and was equally diligent when writing the music that opens act 3, in which Rome awakens to the sounds of church bells.[30] He journeyed to Rome and went to the Castel Sant'Angelo to measure the sound of matins bells there, as they would be heard from its ramparts.[26] Puccini had bells for the Roman dawn cast to order by four different foundries.[31] This apparently did not have its desired effect, as Illica wrote to Ricordi on the day after the premiere, "the great fuss and the large amount of money for the bells have constituted an additional folly, because it passes completely unnoticed".[32] Nevertheless, the bells provide a source of trouble and expense to opera companies performing *Tosca* to this day.[25]

In act 2, when *Tosca* sings offstage the cantata that celebrates the supposed defeat of Napoleon, Puccini was tempted to follow the text of Sardou's play and use the music of Giovanni Paisiello, before finally writing his own imitation of Paisiello's style.[33] It was not until 29th September 1899 that Puccini was able to mark the final page of the score as completed. Despite the notation, there was additional work to be done,[34] such as the shepherd boy's song at the start of act 3. Puccini, who always sought to put local colour in his works, wanted that song to be in Roman dialect. The composer asked a friend to have a "good romesco poet" write some words; eventually the well-known poet and

folklorist, Luigi "Giggi" Zanazzo wrote the verse which, after slight modification, was placed in the opera.[34]

In October 1899, Ricordi realized that some of the music for Cavaradossi's act 3 aria, "O dolci mani" was borrowed from music Puccini had cut from his early opera, Edgar and demanded changes. Puccini defended his music as expressive of what Cavaradossi must be feeling at that point, and offered to come to Milan to play and sing act 3 for the publisher.[35] Ricordi was overwhelmed by the completed act 3 prelude, which he received in early November, and softened his views, though he was still not completely happy with the music for "O dolci mani".[36] In any event time was too short before the scheduled January 1900 premiere to make any further changes.[37]

[edit] Reception and performance history

[edit] Premiere

By December 1899, Tosca was in rehearsal at the Teatro Costanzi.[38] Because of the Roman setting, Ricordi arranged a Roman premiere for the opera,[26] even though this meant that Arturo Toscanini could not conduct it as Puccini had hoped. Toscanini was fully engaged at La Scala in Milan. Leopoldo Mugnone was appointed to conduct. The accomplished (but temperamental) soprano Hariclea Darclé was selected for the title role; Eugenio Giraldoni, whose father had originated multiple Verdi roles, became the first Scarpia. The young Enrico Caruso had hoped to create Cavaradossi, but was passed over in favour of the more experienced Emilio De Marchi.[38] The performance was to be directed by Nino Vignuzzi, with stage designs by Adolfo Hohenstein.[39]

At the time of the premiere, Italy had experienced political and social unrest for several years. The start of the Holy Year in December 1899 attracted the religious to the city, but also brought threats from anarchists and other anticlericals. Police received warnings of an anarchist bombing of the theatre, and instructed Mugnone (who had survived a theatre bombing in Barcelona),[40] that in an emergency he was to strike up the royal march.[41] The unrest caused the premiere to be postponed by one day, to 14 January.[42]

By 1900, the premiere of a Puccini opera was a national event.[41] Many Roman dignitaries attended, as did Queen Margherita, though she arrived late, after the first act.[40] The Prime Minister of Italy, Luigi Pelloux was present, with several members of his cabinet.[42] A number of Puccini's operatic rivals were there, including Franchetti, Pietro Mascagni, Francesco Cilea and Ildebrando Pizzetti. Shortly after the curtain was raised there was a disturbance in the back of the theatre, caused by latecomers attempting to enter the auditorium, and a shout of "Bring down the curtain!", at which Mugnone stopped the orchestra.[40] A few moments later the opera began again, and proceeded without further disturbance.[40]

The performance, while not quite the triumph that Puccini had hoped for, was generally successful, with numerous encores.[40] Much of the critical and press reaction was lukewarm, often blaming Illica's libretto. In response, Illica condemned Puccini for treating his librettists "like stagehands" and reducing the text to a shadow of its original form.[43] Nevertheless, any public doubts about Tosca soon vanished; the premiere was followed by twenty performances, all given to packed houses.[44]

[edit] Subsequent productions

The Milan premiere at La Scala took place under Toscanini on 17 March 1900. Darclé and Giraldoni reprised their roles; the prominent tenor Giuseppe Borgatti replaced De Marchi as Cavaradossi. The opera was a great success at La Scala, and played to full houses.[45] Puccini travelled to London for the British premiere at the Royal Opera House, Covent Garden, on 11 July, with Milka Ternina and Fernando De Lucia as the doomed lovers and Antonio Scotti as Scarpia. Puccini wrote that Tosca was "[a] complete triumph", and Ricordi's London representative quickly signed a contract to take Tosca to New York. The premiere at the Metropolitan Opera (the "Met") was on 4 February 1901, with De Lucia's replacement by Giuseppe Cremonini the only change from the London cast.[46] For its French premiere at the Opéra-Comique on 13 October 1903, the 72-year-old Sardou took charge of all the action on the stage. Puccini was

delighted with the public's reception of the work in Paris, despite adverse comments from critics. The opera was subsequently premiered at venues throughout Europe, the Americas, Australia and the Far East;[47] by the outbreak of war in 1914 it had been performed in more than 50 cities worldwide.[11]

Among the prominent early Toscas was Emmy Destinn, who sang the role regularly in a long-standing partnership with the tenor Enrico Caruso.[48] Maria Jeritza, over many years at the Met and in Vienna, brought her own distinctive style to the role, and was said to be Puccini's ideal Tosca.[49] Jeritza was the first to deliver "Vissi d'arte" from a prone position, having fallen to the stage while eluding the grasp of Scarpia. This was a great success, and Jeritza sang the aria lying down thereafter.[50] Of her successors, opera enthusiasts tend to consider Maria Callas as the supreme interpreter of the role, largely on the basis of her performances at the Royal Opera House in 1964, with Tito Gobbi as Scarpia.[49] This production, by Franco Zeffirelli, remained in continuous use at Covent Garden for more than 40 years until replaced in 2006 by a new staging, which premiered with Angela Gheorghiu. Callas had first sung Tosca at age 18 in a performance given in Greek, in Athens on 27 August 1942.[51] Tosca was also her last on-stage operatic role, in a special charity performance at the Royal Opera House on 7 May 1965.[52]

Among non-traditional productions, in 1996 at La Scala Luca Ronconi used distorted and fractured scenery to represent the twists of fate reflected in the plot.[49] Jonathan Miller, in a 1986 production for the 49th Maggio Musicale Fiorentino, transferred the action to Nazi-occupied Rome in 1944, with Scarpia as head of the fascist police.[53] In Philipp Himmelfmann's production on the Lake Stage at the Bregenz Festival in 2007 the act 1 set, designed by Johannes Leiacker, was dominated by a huge Orwellian "Big Brother" eye. The iris opens and closes to reveal surreal scenes beyond the action. This production updates the story to a modern Mafia scenario, with special effects "worthy of a Bond film".[54]

In 1992 a television version of the opera was filmed at the locations prescribed by Puccini, at the times of day at which each act takes place. Featuring Catherine Malfitano, Plácido Domingo and Ruggero Raimondi, the performance was broadcast live throughout Europe.[55] Luciano Pavarotti, who sang Cavaradossi from the late 1970s, appeared in a special performance in Rome on 14 January 2000, to celebrate the opera's centenary with Domingo as conductor. Pavarotti's last stage performance was as Cavaradossi at the Met, on 13 March 2004.[56]

Early Cavaradossis played the part as if the painter believed that he was reprieved, and would survive the "mock" execution. Beniamino Gigli, who performed the role many times in his forty-year operatic career, was one of the first to assume that the painter knows, or strongly suspects, that he will be shot. Gigli wrote in his autobiography: "he is certain that these are their last moments together on earth, and that he is about to die".[57] Domingo, the dominant Cavaradossi of the 1970s and 1980s, concurred, stating in a 1985 interview that he had long played the part that way.[57] Gobbi, who in his later years often directed the opera, commented, "Unlike Floria, Cavaradossi knows that Scarpia never yields, though he pretends to believe in order to delay the pain for Tosca." [57]

[edit] Critical reception

The enduring popularity of Tosca has not been matched by consistent critical enthusiasm. After the premiere, Ippolito Valetta of Nueva antologia wrote, "[Puccini] finds in his palette all colours, all shades; in his hands, the instrumental texture becomes completely supple, the gradations of sonority are innumerable, the blend unfailingly grateful to the ear." [44] However, one critic described act 2 as overly long and wordy; another echoed Illica and Giacosa in stating that the rush of action did not permit enough lyricism, to the great detriment of the music. A third called the opera "three hours of noise".[58]

The critics gave the work a generally kinder reception in London, where The

Times called Puccini "a master in the art of poignant expression", and praised the "wonderful skill and sustained power" of the music.[59] In The Musical Times, Puccini's score was admired for its sincerity and "strength of utterance." [60] However, after the 1903 Paris opening, the composer Paul Dukas thought the work lacked cohesion and style, while Gabriel Fauré was offended by "disconcerting vulgarities". [61] More recently the musicologist Joseph Kerman described Tosca as a "shabby little shocker", [62] while the composer Benjamin Britten declared that he was "sickened by the cheapness and emptiness" of Puccini's music. [63] Veteran critic Ernest Newman, while acknowledging the "enormously difficult business of boiling [Sardou's] play down for operatic purposes," [64] writes that the subtleties of Sardou's original plot are handled "very lamely", so that "much of what happens, and why, is unintelligible to the spectator". [65] Overall, however, Newman delivers a more positive judgement: "[Puccini's] operas are to some extent a mere bundle of tricks, but no one else has performed the same tricks nearly as well". [66] Opera scholar Julian Budden remarks on Puccini's "inept handling of the political element", but still hails the work as "a triumph of pure theatre". [67] Music critic Charles Osborne ascribes Tosca's immense popularity with audiences to the taut effectiveness of its melodramatic plot, the opportunities given to its three leading characters to shine vocally and dramatically, and the presence of two great arias in "Vissi d'arte" and "E lucevan le stelle". [68] The work remains popular today; it was the second-most performed opera in North America in 2008/2009, surpassed only by Puccini's La bohème. [68]

[edit] General style

By the end of the 19th century the classic form of opera structure, in which arias, duets and other set-piece vocal numbers are interspersed with passages of recitative or dialogue, had been largely abandoned, even in Italy. Operas were "through-composed", with a continuous stream of music which in some cases eliminated all identifiable set-pieces. In what critic Edward Greenfield calls the "Grand Tune" concept, Puccini retains a limited number of set-pieces, distinguished from their musical surroundings by their memorable melodies. Even in the passages linking these "Grand Tunes", Puccini maintains a strong degree of lyricism and only rarely resorts to recitative. [69]

Budden describes Tosca as the most Wagnerian of Puccini's scores, in its use of musical leitmotifs. Unlike Wagner, Puccini does not develop or modify his motifs, nor weave them into the music symphonically, but uses them to refer to characters, objects and ideas, and as reminders within the narrative. [70] The most potent of these motifs is the sequence of three very loud and strident chords which open the opera and which represent the evil character of Scarpia—or perhaps, Charles Osborne proposes, the violent atmosphere that pervades the entire opera. [71] Budden has suggested that Scarpia's tyranny, lechery and lust form "the dynamic engine that ignites the drama". [72] Other motifs identify Tosca herself, the love of Tosca and Cavaradossi, the fugitive Angelotti, the semi-comical character of the sacristan in act 1 and the theme of torture in act 2. [72][73]

The opera begins without any prelude; the opening chords of the Scarpia motif lead immediately to the agitated appearance of Angelotti and the enunciation of the "fugitive" motif. The sacristan's entry, accompanied by his sprightly buffo theme, lifts the mood, as does the generally light-hearted colloquy with Cavaradossi which follows after the latter's entrance. This leads to the first of the "Grand Tunes", Cavaradossi's "Recondita armonia" with its sustained high B flat, accompanied by the sacristan's grumbling counter-melody. [71] The domination, in that aria, of themes which will be repeated in the love duet make it clear that though the painting may incorporate the Marchesa's features, Tosca is the ultimate inspiration of his work. [74] Cavaradossi's dialogue with Angelotti is interrupted by Tosca's arrival, signalled by her motif which incorporates, in Newman's words, "the feline, caressing cadence so characteristic of her." [75] Though Tosca enters violently and suspiciously, the music paints her devotion and serenity. According to Budden, there is no contradiction: Tosca's jealousy is largely a matter of habit, which her lover

does not take too seriously.[76]

After Tosca's "Non la sospiri" and the subsequent argument inspired by her jealousy, the sensuous character of the love duet "Qual'occhio" provides what opera writer Burton Fisher describes as "an almost erotic lyricism that has been called pornophony".[77] The brief scene in which the sacristan returns with the choristers to celebrate Napoleon's supposed defeat provides almost the last carefree moments in the opera; after the entrance of Scarpia to his menacing theme, the mood becomes sombre, then steadily darker.[33] As the police chief interrogates the sacristan, the "fugitive" motif recurs three more times, each time more emphatically, signalling Scarpia's success in his investigation.[78] In Scarpia's exchanges with Tosca the sound of tolling bells, interwoven with the orchestra, creates an almost religious atmosphere,[33] for which Puccini draws on music from his then unpublished Mass of 1880.[79] The final scene in the act is a juxtaposition of the sacred and the profane,[73] as Scarpia's lustful reverie is sung alongside the swelling Te Deum chorus. He joins with the chorus in the final statement "Te aeternum Patrem omnis terra veneratur" ("Everlasting Father, all the earth worships thee"), before the act ends with a thunderous restatement of the Scarpia motif.[73][80]

Fisher has observed that Puccini's was a tragic muse;[77] in the second act of Tosca, according to Newman, he rises to his greatest height as a master of the musical macabre.[81] The act begins quietly, with Scarpia musing on the forthcoming downfall of Angelotti and Cavaradossi, while in the background a gavotte is played in a distant quarter of the Farnese Palace. For this music Puccini adapted a fifteen-year-old student exercise by his late brother, Michele, stating that in this way his brother could live again through him.[82] In the dialogue with Spoletta, the "torture" motifâ ~an "ideogram of suffering", according to Buddenâ ~is heard for the first time as a foretaste of what is to come.[33][83] As Cavaradossi is brought in for interrogation, Tosca's voice is heard with the offstage chorus singing a cantata, "[its] suave strains contrast[ing] dramatically with the increasing tension and ever-darkening colour of the stage action".[84] The cantata is most likely the Cantata a Giove, in the literature referred to as a lost work of Puccini's from 1897.[82]

Osborne describes the scenes that followâ ~Cavaradossi's interrogation, his torture, Scarpia's sadistic tormenting of Toscaâ ~as Puccini's musical equivalent of grand guignol to which Cavaradossi's brief "Vittoria! Vittoria!" on the news of Napoleon's victory gives only partial relief.[85] Scarpia's aria "GiÃ , mi dicon venal" ("Yes, they say I am venal") is closely followed by Tosca's "Vissi d'arte". A lyrical andante based on Tosca's act 1 motif, this is perhaps the opera's best-known aria, yet was regarded by Puccini as a mistake;[86] he considered eliminating it since it held up the action.[87] Fisher calls it "a Job-like prayer questioning God for punishing a woman who has lived unselfishly and righteously".[73] In the act's finale, Newman likens the orchestral turmoil which follows Tosca's stabbing of Scarpia to the sudden outburst after the slow movement of Beethoven's Ninth Symphony.[88] After Tosca's contemptuous "E avanti a lui tremava tutta Roma!" ("All Rome trembled before him"), sung on a middle Câ ~ monotone [89] (sometimes spoken),[85] the music gradually fades, ending "the most impressively macabre scene in all opera." [90] The final notes in the act are those of the Scarpia motif, softly, in a minor key.[91]

The third act's tranquil beginning provides a brief respite from the drama. An introductory 16-bar theme for the horns will later be sung by Cavaradossi and Tosca in their final duet. The orchestral prelude which follows portrays the Roman dawn; the pastoral aura is accentuated by the shepherd boy's song, and the sounds of sheep bells and church bells, the authenticity of latter validated by Puccini's early morning visits to Rome.[77][85] Themes reminiscent of Scarpia, Tosca and Cavaradossi emerge in the music, which changes tone as the drama resumes with Cavaradossi's entrance, to an orchestral statement of what becomes the melody of his aria "E lucevan le stelle".[85] This is a farewell to love and life, "an anguished lament and grief built around the words 'muoio disperato' (I die in despair)".[92] Puccini insisted on the

inclusion of these words, and later stated that admirers of the aria had treble cause to be grateful to him: for composing the music, for having the lyrics written, and "for declining expert advice to throw the result in the waste-paper basket".[93] The lovers' final duet "Amaro sol per te", which concludes with the act's opening horn music, did not equate with Ricordi's idea of a transcendental love duet which would be a fitting climax to the opera. Puccini justified his musical treatment by citing Tosca's preoccupation with teaching Cavaradossi to feign death.[70]

In the execution scene which follows, a theme emerges, the incessant repetition of which reminded Newman of the Transformation Music which separates the two parts of act 1 in Wagner's Parsifal.[94] In the final bars, as Tosca evades Spoletta and leaps to her death, the theme of "E lucevan le stelle" is played tutta forza (as loudly as possible). This choice of ending has been strongly criticised by analysts, mainly because of its specific association with Cavaradossi rather than Tosca.[67] Joseph Kerman mocked the final music, "Tosca leaps, and the orchestra screams the first thing that comes into its head." [95] Budden, however, argues that it is entirely logical to end this dark opera on its blackest theme.[67] According to historian and former opera singer Susan Vandiver Nicassio: "The conflict between the verbal and the musical clues gives the end of the opera a twist of controversy that, barring some unexpected discovery among Puccini's papers, can never truly be resolved." [95]

[edit] List of arias and set numbers

First lines

Performed by

Act 1

"Recondita armonia"

("Hidden harmony")

Cavaradossi

"Non la sospiri, la nostra casetta"

("Do you not long for our little house")

Tosca, Cavaradossi

"Qual'occhio"

("What eyes in the world")

Cavaradossi, Tosca

"Va, Tosca!"

("Go, Tosca!")

Scarpia, Chorus

Te Deum laudamus

("We praise thee, O God")

Scarpia, Chorus

Act 2

"Ha piÃ¹ forte sapore"

("For myself the violent conquest")

Scarpia

"Vittoria! Vittoria!"

("Victory! Victory!")

Cavaradossi

"GiÃ , mi dicon venal"

("Yes, they say that I am venal")

Scarpia

"Vissi d'arte"

("I lived for art, I lived for love")

Tosca

Act 3

"Io de' sospiri"

("I give you sighs")

Voice of a shepherd boy

"E lucevan le stelle"

("And the stars shone")

Cavaradossi

"O dolci mani"
("Oh, sweet hands")
Cavaradossi
"Amaro sol per te m'era il morire"
("Only for you did death taste bitter for me")
Cavaradossi, Tosca
[edit] Recordings

The first complete Tosca recording was made in 1919, using the pre-microphone acoustic process. The conductor, Carlo Sabajno, had been The Gramophone Company's house conductor since 1904; he had made recordings of Verdi's Ernani and Rigoletto before tackling Tosca with a young and largely unknown cast.[96] In 1929 Sabajno recorded the opera again, with the orchestra and chorus of the Teatro alla Scala and with star names Carmen Melis and Apollo Granforte in the roles of Tosca and Scarpia.[97] In 1938 HMV secured the services of the renowned tenor Beniamino Gigli for a "practically complete" recording that extended over 14 double-sided shellac discs.[98]

In the post-war period, following the invention of long-playing records, Tosca recordings were dominated by Maria Callas. The earliest of her recordings in the role were of two live performances in Mexico City, in 1950 and 1952.[99] In 1953, with conductor Victor de Sabata and the La Scala forces, she made the recording which for decades has been considered the best of all the recorded performances of the opera.[100][101] Callas made several more recordings, mainly of live stage performances, the last in 1965.[99] The first stereo recording of the opera was made in 1959, with Francesco Molinari-Pradelli conducting the Santa Cecilia orchestra and chorus with Renata Tebaldi as Tosca and Mario Del Monaco as Cavaradossi.[102] Herbert von Karajan's acclaimed performance with the Vienna State Opera was in 1963, with Leontyne Price, Giuseppe Di Stefano and Giuseppe Taddei in the leading roles.[100]

The 1970s and 1980s saw a proliferation of recordings, many of live performances. Plácido Domingo first recorded Cavaradossi in 1973, and continued to do so at regular intervals until 1994. In 1976 he was joined by his son, Plácido Domingo Jr., who sang the shepherd boy's song in a British recording with the New Philharmonia Orchestra. More recent commended recordings have included Antonio Pappano's 2000 Royal Opera House version with Angela Gheorghiu, Roberto Alagna and Ruggero Raimondi.[100] Recordings of Tosca in languages other than Italian are rare but not unknown; over the years versions in French, German, Spanish, Hungarian and Russian have been issued.[99] An admired English language version was released in 1995 in which David Parry led the Philharmonia Orchestra and a largely British cast.[103] Since the late 1990s numerous video recordings of the opera have been issued on DVD and Blu-ray disc (BD). These include recent productions and remastered versions of historic performances.[104]

[edit] Editions and amendments

The orchestral score of Tosca was published in late 1899 by Casa Ricordi. In contrast to his other operas, Puccini appeared to be satisfied with his initial score, which remained relatively unchanged in the 1909 edition prepared by Osbourne McConachy.[105] An unamended edition was published by Dover Press in 1991.[106]

The 1909 score contains a number of minor changes from the autograph score. Some are changes of phrase: Cavaradossi's reply to the sacristan when he asks if the painter is doing penance is changed from "Pranzai"[107] ("I have eaten.") to "Fame non ho" ("I am not hungry."), which William Ashbrook states, in his study of Puccini's operas, accentuates the class distinction between the two. When Tosca comforts Cavaradossi after the torture scene, she now tells him, "Ma il giusto Iddio lo punirà;" ("But a just God will punish him" [Scarpia]); formerly she stated, "Ma il sozzo sbirro lo pagherà " ("But the filthy cop will pay for it."). Other changes are in the music; when Tosca demands the price for Cavaradossi's freedom ("Il prezzo!"), her music is changed to eliminate an octave leap, allowing her more opportunity to express her contempt and loathing of Scarpia in a passage which is now near the middle

of the soprano vocal range.[108] A remnant of a "Latin Hymn" sung by Tosca and Cavaradossi in act 3 survived into the first published score and libretto, but is not in later versions.[109] According to Ashbrook, the most surprising change is where, after Tosca discovers the truth about the "mock" execution and exclaims "Finire cosÃ-? Finire cosÃ-?" ("To end like this? To end like this?"), she was to sing a five-bar fragment to the melody of "E lucevan le stelle". Ashbrook applauds Puccini for deleting the section from a point in the work where delay is almost unendurable as events rush to their conclusion. He also points out that the orchestra's recalling "E lucevan le stelle" in the final notes would seem less incongruous if it was meant to underscore Tosca's and Cavaradossi's love for each other, rather than being simply a melody which Tosca never hears.[110]

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 ^ In the first edition the line was recited later, on the Dâ - before rehearsal
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 [edit] Further reading
 [edit] External links

Banksia paludosa, commonly known as the marsh or swamp banksia, is a species of shrub in the plant genus *Banksia*. It is endemic to New South Wales, where it is found between Sydney and Batemans Bay, with an isolate population further south around Eden. Two subspecies are recognised, the nominate of which is a spreading shrub to 1.5 m (5 ft) in height, and subsp. *astrolux* is a taller shrub to 5 m (16 ft) high found only in Nattai National Park.

Native mammals, such as the Brown Antechinus and Sugar Glider, are important pollinators of *Banksia paludosa*. Several species of honeyeaters visit the flower spikes, as do ants and the European honeybee. The response to bushfire depends on the subspecies; subspecies *paludosa* regenerates from underground lignotubers, while plants of subspecies *astrolux* are killed by fire and regenerate from large stores of seed which have been held in cones in the plant canopy. *Banksia paludosa* is sometimes seen in cultivation, with dwarf forms being registered and sold.

[edit] Description

The two subspecies of *Banksia paludosa* are identical in foliage and flower, and differ only on their size, habit, and response to bushfire.[2]*Banksia paludosa* subspecies *paludosa* is most commonly encountered as a spreading multistemmed shrub generally under 1.5 m (5 ft) high, or rarely 2 m (7 ft). In

heathland habitats such as Nadgee[3] or Barren Grounds Nature Reserves,[4] it may not exceed 1 m (3 ft) in height. At an exposed area such as Green Cape, it is reduced further to a 30 cm (12 in) prostrate shrub.[5] This subspecies has a woody base, known as a lignotuber, which begins developing in the first year of life.[3] *Banksia paludosa* subspecies *astrolux* is a more open nonlignotuberous shrub which reaches 5 m (16 ft) high.[2]

The bark and foliage is smooth, although the new growth is covered in fine hair. The stems are generally less than 2 cm (0.8 in) in diameter,[3] and may be red or yellow when young.[6] The leaves are alternate or whorled along the stems, and spear- to egg-shaped (lanceolate to obovate) in shape. They measure 4–13 cm (1.6–5.2 in) long and 1–3 cm (0.4–1.2 in) wide. The leaf margins are entire or have occasional serrations. The leaf undersurface is white, with a midrib.[3] Flowering occurs over autumn and winter (April to July) and the flower spikes, known as inflorescences, arise from stems that are three or more years old. Cylindrical in shape, they are composed of a central woody spike or axis from which a large number of compact floral units arise perpendicularly to it, and are generally 3.2–4 cm (1.3–1.8 in) wide and 7–13 cm (2.8–5.2 in) high.[3] The individual flowers are more openly spaced than those of other banksias, and this is especially evident in late bud.[6] This, coupled with the tall thin shape of the flower spike, makes the species quite distinctive.[3] The flower spikes are pale- to golden brown in bud, and open to a more gold colour after anthesis.[6] Variations are seen, one form having a grey limb in bud, and plants with particularly tall flower spikes have been recorded near Huskisson at Jervis Bay.[7] As with most banksias, anthesis is acropetal; the opening of the individual buds proceeds up the flower spike from the base to the top.[3] The process from bud to the finishing of flowering takes six to eight weeks.[8]

As they age, the flower spikes fade to grey, with the old flowers remaining for years. Up to 60 woody follicles develop on each spike, known in this stage as an infructescence. Narrow and elliptic, they measure 0.9–1.8 cm (0.4–0.7 in) long, 0.1–0.5 cm (0.0–0.2 in) high, and 0.3–0.7 cm (0.1–0.3 in) wide. Some follicles open spontaneously, but most remain closed until burnt by bushfire. Each follicle contains one or two fertile seeds, between which lies a woody dark brown separator of similar shape to the seeds. Measuring 1.3–1.8 cm (0.5–0.7 in) in length, the seed is obovate, and composed of a dark brown 0.8–1.3 cm (0.3–0.5 in) wide membranous "wing" and sickle-shaped (falcate) seed proper which measures 0.8–0.9 cm (0.3–0.4 in) long by 0.3–0.4 cm (0.1–0.2 in) wide. The seed surface can be smooth or covered in tiny ridges, and often glistens. The resulting seedling first grows two asymmetrical obovate cotyledon leaves measuring 0.9 cm (0.4 in) long by 0.7 cm (0.3 in) wide, which may remain for several months as several more leaves appear. The first pairs of leaves are oppositely arranged on the stem, have 3–4 "teeth" on their margins, and are narrowly obovate in shape. They are around 1.2–1.4 cm (0.5–0.6 in), and each following pair of leaves is slightly larger[3]

The cotyledons of *Banksia paludosa*, *B. marginata* and *B. integrifolia* are very similar in appearance.[9] The foliages of larger shrubs of both *Banksia paludosa* subspecies resemble those of *Banksia conferta* subsp. *penicillata*, but the latter has a wider inflorescence, and the buds are more crowded in appearance on the inflorescence before anthesis.[10] *Banksia paludosa* also bears a superficial resemblance to *B. oblongifolia*, but latter has a prominent midrib on the leaf underside, the new growth is covered in rusty fur, and the old spikes are bare of flowers. The latter grows on dryer rocky soils while the former is on wetter sandy soils.[11]

[edit] Taxonomy

Banksia paludosa was first described by Robert Brown in his 1810 *On the Proteaceae of Jussieu*, and named *Banksia paludosa*. In 1870, George Bentham demoted it to a variety of *B. integrifolia* (Coast Banksia), but in 1981 Alex George restored it to species rank. Its specific epithet is derived from the Latin noun *palus* "marsh", but is somewhat misleading, as it more often grows on sandstone ridges and heathland. Its common names, marsh banksia and swamp

banksia, echo its scientific name.[12]

[edit] Placement within Banksia

The current taxonomic arrangement of the Banksia genus is based on botanist Alex George's 1999 monograph for the Flora of Australia book series.[2] In this arrangement, *B. paludosa* is placed in Banksia subgenus Banksia, because its inflorescences take the form of Banksia's characteristic flower spikes, section Banksia because of its straight styles, and series Salicinae because its inflorescences are cylindrical. In a morphological cladistic analysis published in 1994, Kevin Thiele placed it in the newly described subseries Integrifoliae, within the series Salicinae.[13] However, this subgrouping of the Salicinae was not supported by George.[2]

B. paludosa's placement within Banksia may be summarised as follows:

Genus Banksia

Subgenus Isostylis

Subgenus Banksia

Section Oncostylis

Section Coccinea

Section Banksia

Series Grandes

Series Banksia

Series Crocinae

Series Prostratae

Series Cyrtostylis

Series Tetragonae

Series Bauerinae

Series Quercinae

Series Salicinae

B. dentata ^ *B. aquilonia* ^ *B. integrifolia* ^ *B. plagiocarpa* ^ *B. oblongifolia*
^ *B. robur* ^ *B. conferta* ^ *B. paludosa* ^ *B. marginata* ^ *B. canei* ^ *B. saxicola*

Since 1998, American botanist Austin Mast and co-authors have been publishing results of ongoing cladistic analyses of DNA sequence data for the subtribe Banksiinae, which then comprised genera Banksia and Dryandra. Their analyses suggest a phylogeny that differs greatly from George's taxonomic arrangement. Banksia paludosa resolves as the closest relative, or "sister", to the three subspecies of *B. integrifolia*. [14][15][16] In 2007, Mast and Thiele rearranged the genus Banksia by merging Dryandra into it, and published *B.* subg. Spathulatae for the taxa having spoon-shaped cotyledons; thus *B.* subg. Banksia was redefined as encompassing taxa lacking spoon-shaped cotyledons. They foreshadowed publishing a full arrangement once DNA sampling of Dryandra was complete; in the meantime, if Mast and Thiele's nomenclatural changes are taken as an interim arrangement, *B. paludosa* is placed in *B.* subg. Spathulatae.[17]

[edit] Subspecies

Two subspecies are recognised. The more widespread subspecies *paludosa* is a lignotuberous shrub to 1.5 m (5 ft) high, while subspecies *astrolux*, a rare plant known only from the Starlight Trail in Nattai National Park, is a nonlignotuberous shrub which reaches 5 m (16 ft) high.[2] The latter was first recorded by contributors Brian Walters and Kevin Mills for The Banksia Atlas mapping project in the mid-1980s. They initially thought the plants were Banksia conferta subsp. penicillata until they observed the flower spikes typical of *B. paludosa*. The subspecies was initially termed the Nattai River form of *B. paludosa*, [18] until it was formally named by George, who coined its species name from the Ancient Greek aster "star" and Latin lux "light", a translation of the place it was found.[19]

Hybrids with Banksia marginata and *B. integrifolia* have been recorded at Nadgee Nature Reserve, where all three species occur.[5] A study of an area of extensive hybridization between *B. robur* and *B. oblongifolia* at Barren Grounds Nature Reserve revealed some plants with morphology suggestive of *B. paludosa* in their parentage, and requiring further investigation.[20]

[edit] Distribution and habitat

Both subspecies of Banksia paludosa are endemic to New South Wales. The

nominate subspecies *paludosa* is found from Glen Davis through to the Sydney region and then south to Ulladulla on the South Coast, with a separate population in the vicinity of Eden just north of the Victorian border. It occurs inland as far as Taralga on the Southern Tablelands. It was collected in 1966 from Hat Head on the Mid North Coast by Lawrie Johnson, but has not been found there since despite field work in the area.[5] This record aside, the northernmost historical coastal record is from what is now Centennial Park and La Perouse in Sydney's eastern suburbs, where it is now locally vanished.[8] Subspecies *astrolux* is restricted to Nattai National Park in the Southern Highlands.[5]

Both subspecies grow in nutrient-poor well-drained sandstone soils, in open woodland with trees such as Sydney peppermint (*Eucalyptus piperita*), silvertop ash (*E. sieberi*), grey gum (*E. punctata*), narrow-leaved stringybark (*E. sparsifolia*), red bloodwood (*Corymbia gummifera*) and smooth-barked apple (*Angophora costata*), and in heathland with species such as dwarf banksia (*Banksia oblongifolia*), coral heath (*Epacris microphylla*), and dagger hakea (*Hakea teretifolia*).[8]

[edit] Ecology

Banksia paludosa subspecies *paludosa* is a slow-growing shrub which regenerates from bushfire by resprouting from its lignotuber. After fire, plants take around three years to flower significantly, but are flowering well by five years afterwards. Flowerhead numbers dwindle by fourteen years post bushfire. Plants are estimated to live to around 60 years of age. Seedlings also appear from seed dispersed after bushfire.[8] All banksias have developed proteoid or cluster roots in response to the nutrient-poor conditions of Australian soils (particularly lacking in phosphorus).[21]

The flower spikes of *Banksia paludosa* are unable to self-pollinate and require pollinators to set seed.[4] A 1988 isozyme study showed very high rates of outcrossing; pollen from one plant is well-mixed among other plants in the locale. Nonflying mammals are important pollinators in heathland habitat, with the Brown Antechinus (*Antechinus stuartii*) a frequent visitor to flower spikes. The Sugar Glider (*Petaurus breviceps*) is another mammal pollinator.[4] Bird species that have been observed foraging and feeding at the flowers include the Red Wattlebird (*Anthochaera carunculata*), Yellow-faced Honeyeater (*Lichenostomus chrysops*), White-eared Honeyeater (*L. leucotis*), Crescent Honeyeater (*Phylidonyris pyrrhoptera*), New Holland Honeyeater (*P. novaehollandiae*), and Eastern Spinebill (*Acanthorhynchus tenuirostris*).[5] Insects recorded visiting flower spikes include the European Honey Bee and ants.[5]

[edit] Cultivation

Banksia paludosa was first introduced into cultivation in England in 1805. The species was grown at Kew, Cambridge Botanic Gardens, Woburn Abbey, Loddiges nursery in Hackney, John Miller's nursery in Bristol and George Hibbert's garden at Clapham Common.[22] It was also grown in the Villa San Donato in Italy, in the collection of Anatoly Nikolaievich Demidov, 1st Prince of San Donato.[23]

Banksia paludosa is cultivated in Australian gardens, and does best with a sunny aspect and good drainage, in soils with a pH from 5.5 to 7.5. Slow growing, it flowers in 6 to 10 years from seed.[6] It can be propagated by seed, which take around two weeks to germinate,[24] or cutting. Low growing coastal (dwarf) forms which grow to 60 cm (2 ft) are also commercially available, and should be propagated by cutting to preserve features.[6] Noting the flower spikes to be "rather dull", plant author John Wrigley has described the species as "not a spectacular garden plant",[24] although its foliage has been described as "attractive".[12] A form from Jervis Bay with large orange flower spikes was deemed by amateur botanist and banksia enthusiast Alf Salkin to have horticultural potential.[25]

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[edit] External links

Galerina marginata is a species of poisonous fungus in the family
Hymenogastraceae of the order Agaricales. Prior to 2001, the species *G.Â*
autumnalis, *G.Â oregonensis*, *G.Â unicolor*, and *G.Â venenata* were thought to be
separate due to differences in habitat and the viscosity of their caps, but
phylogenetic analysis showed that they are all the same species.

The fruit bodies of this fungus have brown to yellow-brown caps that fade in
color when drying. The gills are brownish and give a rusty spore print. A
well-defined membranous ring is typically seen on the stems of young specimens
but often disappears with age. In older fruit bodies, the caps are flatter and
the gills and stems browner. The species is a classic "little brown mushroom"â ~a
catchall category that includes all small to medium-sized, hard-to-identify
brownish mushrooms, and may be easily confused with several edible species.

Galerina marginata is widespread in the Northern Hemisphere, including Europe,
North America, and Asia, and has also been found in Australia. It is a
wood-rotting fungus that grows predominantly on decaying conifer wood. An
extremely poisonous species, it contains the same deadly amatoxins found in the
death cap (*Amanita phalloides*). Ingestion in toxic amounts causes severe liver
damage with vomiting, diarrhea, hypothermia, and eventual death if not treated
rapidly. About ten poisonings have been attributed to the species now grouped
as *G.Â marginata* over the last century.

[edit] Taxonomy and naming

What is now recognized as a single morphologically variable taxon named
Galerina marginata was once split into five distinct species. Norwegian
mycologist Gro Gulden and colleagues concluded that all five represented the
same species after comparing the DNA sequences of the internal transcribed
spacer region of ribosomal DNA for various North American and European
specimens in *Galerina* section *Naucoriopsis*. The results showed no genetic
differences between *G.Â marginata* and *G.Â autumnalis*, *G.Â oregonensis*, *G.Â*
unicolor, and *G.Â venenata*, thus reducing all these names to synonymy.[1] The
oldest of these names are *Agaricus marginatus*, described by August Batsch in
1789,[2] and *Agaricus unicolor*, described by Martin Vahl in 1792.[3] *Agaricus*
autumnalis was described by Charles Horton Peck in 1873, and later moved to
Galerina by A.Â H.Â Smith and Rolf Singer in their 1962 worldwide monograph on
that genus. In the same publication they also introduced the *G.Â autumnalis*
varieties *robusta* and *angusticystis*. [4] Another of the synonymous species, *G.Â*
oregonensis, was first described in that monograph. *Galerina venenata* was first
identified as a species by Smith in 1953.[5] Since *Agaricus marginatus* is the
oldest validly published name, it has priority according to the rules of
botanical nomenclature.[6]

Another species analysed in Gulden's 2001 study, *Galerina pseudomycenopsis*,
also could not be distinguished from *G.Â marginata* based on ribosomal DNA
sequences and restriction fragment length polymorphism analyses. Because of
differences in ecology, fruit body color and spore size combined with
inadequate sampling, the authors preferred to maintain *G.Â pseudomycenopsis* as a

distinct species.[1] A 2005 study again failed to separate the two species using molecular methods, but reported that the incompatibility demonstrated in mating experiments suggests that the species are distinct.[7]

In the fourth edition (1986) of Singer's comprehensive classification of the Agaricales, *G. marginata* is the type species of *Galerina* section *Naucoriopsis*, a subdivision first defined by French mycologist Robert K  hner in 1935.[8] It includes small brown-spored mushrooms characterized by cap edges initially curved inwards, fruit bodies resembling *Pholiota* or *Naucoria*[9] and thin-walled, obtuse or acute-ended pleurocystidia that are not rounded at the top. Within this section, *G. autumnalis* and *G. oregonensis* are in stirps *Autumnalis*, while *G. unicolor*, *G. marginata*, and *G. venenata* are in stirps *Marginata*. *Autumnalis* species are characterized by having a viscid to lubricous cap surface while *Marginata* species lack a gelatinous cap ~the surface is moist, "fatty-shining", or matte when wet.[10] However, as Gulden explains, this characteristic is highly variable: "Viscosity is a notoriously difficult character to assess because it varies with the age of the fruitbody and the weather conditions during its development. Varying degrees of viscosity tend to be described differently and applied inconsistently by different persons applying terms such as lubricous, fatty, fatty-shiny, sticky, viscid, glutinous, or (somewhat) slimy." [11]

The specific epithet *marginata* is derived from the Latin word for "margin" or "edge", [11] while *autumnalis* means "of the autumn". [12] Common names of the species include the "marginate *Pholiota*" (resulting from its synonymy with *Pholiota marginata*), [13] "funeral bell", [14] "deadly skullcap", and "deadly *Galerina*". *G. autumnalis* was known as the "fall *Galerina*" or the "autumnal *Galerina*", while *G. venenata* was the "deadly lawn *Galerina*". [15][16]

[edit] Description

The cap reaches 1.7 to 4 cm (0.67 to 1.6 in) in diameter. It starts convex, sometimes broadly conical, and has edges (margins) that are curved in against the gills. As the cap grows and expands, it becomes broadly convex and then flattened, sometimes developing a central elevation, or umbo, which may project prominently from the cap surface. [13]

Based on the collective descriptions of the five taxa now considered to be *G. marginata*, the texture of the surface shows significant variation. Smith and Singer give the following descriptions of surface texture: from "viscid" (*G. autumnalis*), [4] to "shining and viscid to lubricous when moist" (*G. oregonensis*), [17] to "shining, lubricous to subviscid (particles of dirt adhere to surface) or merely moist, with a fatty appearance although not distinctly viscid", [18] to "moist but not viscid" (*G. marginata*). [19] The cap surface remains smooth and changes colors with humidity (hygrophanous), pale to dark ochraceous tawny over the disc and yellow-ochraceous on the margin (at least when young), but fading to dull tan or darker when dry. When moist, the cap is somewhat transparent so that the outlines of the gills may be seen as striations. The flesh is pale brownish ochraceous to nearly white, thin and pliant, with an odor and taste varying from very slightly to strongly like flour (farinaceous). [19]

The gills are typically narrow and crowded together, with a broadly adnate to nearly decurrent attachment to the stem and convex edges. They are a pallid brown when young, becoming tawny at maturity. Some short gills, called lamellulae, do not extend entirely from the cap edge to the stem, and are intercalated among the longer gills. The stem ranges from 3 to 6 cm (1.2 to 2.4 in) long, 3 to 9 mm (0.12 to 0.35 in) thick at the apex, and stays equal in width throughout or is slightly enlarged downward. Initially solid, it becomes hollow from the bottom up as it matures. The membranous ring is located on the upper half of the stem near the cap, but may be sloughed off and missing in older specimens. Its color is initially whitish or light brown, but usually appears a darker rusty-brown in mature specimens that have dropped spores on it. Above the level of the ring, the stem surface has a very fine whitish powder and is paler than the cap; below the ring it is brown down to the reddish-brown to bistre base. The lower portion of the stem has a thin coating

of pallid fibrils which eventually disappear and do not leave any scales. The spore print is rusty-brown.[19]

[edit] Microscopic characteristics

The spores measure $8\hat{a}^{10}$ by $5\hat{a}^{6\hat{A}}\hat{A}\mu\text{m}$, and are slightly inequilateral in profile view, and egg-shaped in face view. Like all *Galerina* species, the spores have a plage, which has been described as resembling "a slightly wrinkled plastic shrink-wrap covering over the distal end of the spore".[20] The spore surface is warty and full of wrinkles, with a smooth depression where the spore was once attached via the sterigmata to the basidium (the spore-bearing cell). When in potassium hydroxide (KOH) solution, the spores appear tawny or darker rusty-brown, with an apical callus. The basidia are four-spored (rarely with a very few two-spored ones), roughly cylindrical when producing spores, but with a slightly tapered base, and measure $21\hat{a}^{29}$ by $5\hat{a}^{8.4\hat{A}}\hat{A}\mu\text{m}$. [19]

Cystidia are cells of the fertile hymenium that do not produce spores. These sterile cells, which are structurally distinct from the basidia, are further classified according to their position. In *G. marginata*, the pleurocystidia (cystidia from the gill sides) are $46\hat{a}^{60}$ by $9\hat{a}^{12\hat{A}}\hat{A}\mu\text{m}$, thin-walled, and hyaline in KOH, fusoid to ventricose in shape with wavy necks and blunt to subacute apices ($3\hat{a}^{6\hat{A}}\hat{A}\mu\text{m}$ diameter near apex). The cheilocystidia (cystidia on the gill edges) are similar in shape but often smaller than the pleurocystidia, abundant, with no club-shaped or abruptly tapering (mucronate) cells present. Clamp connections are present in the hyphae.[19]

[edit] Similar species

Galerina marginata may be mistaken for a few edible mushroom species. *Pholiota mutabilis* produces fruit bodies roughly similar in appearance and also grows on wood, but may be distinguished from *G. marginata* by its stems bearing scales up to the level of the ring, and from growing in large clusters (which is not usual of *G. marginata*). However, the possibility of confusion is such that this good edible species is "not recommended to those lacking considerable experience in the identification of higher fungi." [21] Furthermore, microscopic examination shows smooth spores in *Pholiota*. [22] *G. marginata* may be easily confused with other edibles such as *Armillaria mellea* and *Kuehneromyces mutabilis*. [23] Regarding the latter species, one source notes "Often, *G. marginata* bears an astonishing resemblance to this fungus, and it requires careful and acute powers of observation to distinguish the poisonous one from the edible one." [13] *K. mutabilis* may be distinguished by the presence of scales on the stem below the ring, the larger cap, which may reach a diameter of $6\hat{A}\text{ cm}$ ($2.4\hat{A}\text{ in}$), and spicy or aromatic odor of the flesh. The related *K. vernalis* is a rare species and even more similar in appearance to *G. marginata*. Examination of microscopic characteristics is typically required to reliably distinguish between the two, revealing smooth spores with a germ pore. [13]

Another potential edible lookalike is the "velvet foot", *Flammulina velutipes*. This species has gills that are white to pale yellow, a white spore print, and spores that are elliptical, smooth, and measure $6.5\hat{a}^9$ by $2.5\hat{a}^{4\hat{A}}\hat{A}\mu\text{m}$. [24] A rough resemblance has also been noted with the edible *Hypholoma capnoides*, [13] as well as *Conocybe filaris*, another poisonous amatoxin-containing species. [25]

[edit] Habitat and distribution

Galerina marginata is a saprobic fungus, [6] obtaining nutrients by breaking down organic matter. It is known to have most of the major classes of secreted enzymes that dissolve plant cell wall polysaccharides, and has been used as a model saprobe in recent studies of ectomycorrhizal fungi. [26] [27] Because of its variety of enzymes capable of breaking down wood and other lignocellulosic materials, the Department of Energy Joint Genome Institute (JGI) is currently sequencing its genome. The fungus is typically reported to grow on or near the wood of conifers, although it has been observed to grow on hardwoods as well. [23] [1] Fruit bodies may grow solitarily, but more typically in groups or small clusters, and appear in the summer to autumn. Sometimes, they may grow on buried wood and thus appear to be growing on soil. [16]

Galerina marginata is widely distributed throughout the Northern Hemisphere, found in North America, Europe, Japan, Iran, [28] continental Asia, and the

Caucasus.[19][29][30] In North America, it has been collected as far north as the boreal forest of Canada[31] and subarctic and arctic habitats in Labrador,[32] and south to Jalisco, Mexico.[33] It is also found in Australia.[34]
[edit] Toxicity

Fruit bodies contain deadly amatoxins.

General chemical structure of amatoxins

The toxins found in *Galerina marginata* are known as amatoxins. Amatoxins belong to a family of bicyclic octapeptide derivatives composed of an amino acid ring bridged by a sulphur atom and characterized by differences in their side groups; these compounds are responsible for more than 90% of fatal mushroom poisonings in humans. The amatoxins inhibit the enzyme RNA polymerase II, which copies the genetic code of DNA into messenger RNA molecules. The toxin naturally accumulates in liver cells, and the ensuing disruption of metabolism accounts for the severe liver dysfunction caused by amatoxins. Amatoxins also lead to kidney failure because, as the kidneys attempt to filter out poison, it damages the convoluted tubules and reenters the blood to recirculate and cause more damage. Initial symptoms after ingestion include severe abdominal pain, vomiting, and diarrhea which may last for six to nine hours. Beyond these symptoms, toxins severely affect the liver which results in gastrointestinal bleeding, a coma, kidney failure, or even death, usually within seven days of consumption.[35]

Galerina marginata was shown in various studies to contain the amatoxins Î±-amanitin and Î³-amanitin, first as *G.Â venenata*,[36] then as *G.Â marginata* and *G.Â autumnalis*. [37] The ability of the fungus to produce these toxins was confirmed by growing the mycelium as a liquid culture (only trace amounts of Î±-amanitin were found). [38] *G.Â marginata* is thought to be the only species of the amatoxin-producing genera that will produce the toxins while growing in culture. [39] Both amanitins were quantified in *G.Â autumnalis* (1.5Â mg/g dry weight) [40] and *G.Â marginata* (1.1Â mg/g dry weight). [41] Later experiments confirmed the occurrence of Î³-amanitin and Î±-amanitin in German specimens of *G.Â autumnalis* and *G.Â marginata* and revealed the presence of the three amanitins in the fruit bodies of *G.Â unicolor*. [42] Although some mushroom field guides claim that the species (as *G.Â autumnalis*) also contains phallotoxins, [15] [43] scientific evidence does not support this contention. [23] A 2004 study determined that the amatoxin content of *G.Â marginata* varied from 78.17 to 243.61Â µg/g of fresh weight. In this study, the amanitin amounts from certain *Galerina* specimens were higher than those from some *Amanita phalloides*, a European fungus generally considered as the richest in amanitins. The authors suggest that "other parameters such as extrinsic factors (environmental conditions) and intrinsic factors (genetic properties) could contribute to the significant variance in amatoxin contents from different specimens." [23] The lethal dose of amatoxins has been estimated to be about 0.1Â mg/kg human body weight, or even lower. [44] Based on this value, the ingestion of 10 *G.Â marginata* fruit bodies containing about 250Â µg of amanitins per gram of fresh tissue could poison a child weighing approximately 20 kilograms (44Â lb). However, a 20-year retrospective study of more than 2100 cases of amatoxin poisonings from North American and Europe showed that few cases were due to ingestion of *Galerina* species. This low frequency may be attributed to the mushroom's nondescript appearance as a "little brown mushroom" leading to it being overlooked by collectors, and by the fact that 21% of amatoxin poisonings were caused by unidentified species. [23]

The toxicity of certain *Galerina* species has been known for a century. In 1912, Charles Horton Peck reported a human poisoning case due to *G. autumnalis*.^[45] In 1954, a poisoning was caused by *G. venenata*.^[46] Between 1978 and 1995, ten cases caused by amatoxin-containing *Galerinas* were reported in the literature. Three European cases, two from Finland^[47] and one from France^[48] were attributed to *G. marginata* and *G. unicolor*, respectively. Seven North American exposures included two fatalities from Washington due to *G. venenata*,^[16] with five cases reacting positively to treatment; four poisonings were caused by *G. autumnalis* from Michigan and Kansas,^{[49][50]} in addition to poisoning caused by an unidentified *Galerina* species from Ohio.^[51] Several poisonings have been attributed to collectors consuming the mushrooms after mistaking them for hallucinogenic *Psilocybe* species,^[52] such as *P. stuntzii*.^[53]

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Look Mickey (also known as Look Mickey!) is a 1961 oil on canvas painting by Roy Lichtenstein. It is widely regarded as the bridge between his abstract expressionism and pop art works. It is notable for its ironic humor and aesthetic value as well as being the first example of the artist's employment of Ben-Day dots, speech balloons and comic imagery as a source for a painting. The painting was bequeathed to the Washington, D.C. National Gallery of Art upon the death of the artist.

Building on his late 1950s drawings of comic strips characters, Look Mickey marks Lichtenstein's first full employment of painterly techniques to reproduce almost faithful representations of pop culture and so satirize and comment upon the then developing process of mass production of visual imagery. In this, Lichtenstein pioneered a motif that became influential not only in 1960s Pop art but continuing to the work of artists today. Lichtenstein borrows from a Donald Duck illustrated story book, showing Mickey Mouse and Donald Duck during a fishing mishap. However, he makes significant alterations to the original source, including modifying the color scheme and perspective, while seeming to make statements about himself.

The work dates from Lichtenstein's first solo exhibition, and is regarded by art critics as revolutionary both as a progression of pop art and as a work of modern art in general. It was later reproduced in his 1973 painting, Artist's Studioâ ~Look Mickey, which shows the painting hanging prominently on a facing wall of Lichtenstein's studio.

[edit] Background

During the late 1950s and early 1960s a number of American painters began to

adapt the imagery and motifs of comic strips into their work. Lichtenstein was among them, and in 1958 began to make drawings of comic strip characters. Andy Warhol produced his earliest paintings in the style in 1960. Lichtenstein, unaware of Warhol's work, produced Look Mickey and Popeye in 1961.[1] Lichtenstein's 1961 works, especially Look Mickey, are considered a minor step from his earlier comic strip pop art.[2]

According to the Lichtenstein Foundation, Look Mickey was based on the Little Golden Book series.[3] The National Gallery of Art notes that the source is entitled Donald Duck Lost and Found, written in 1960 by Carl Buettnner and published through Disney Enterprises. The image was illustrated by Bob Grant and Bob Totten.[4][5] An alternate theory suggests that Look Mickey and Popeye were enlargements of bubble gum wrappers.[1] This image marked the first of numerous of works in which Lichtenstein cropped his source to bring the viewer closer to the scene.[6]

A number of stories purport to tell of the moment of inspiration for Look Mickey. Critic Alice Goldfarb Marquis writes that the artist recalled one of his sons pointing to a comic book and challenging; "I bet you can't paint as good as that".[7] Another says that the painting resulted from an effort to prove his abilities to both his son and his son's classmates who mocked Lichtenstein's hard to fathom abstracts.[8] American painter Allan Kaprow once stated, in reference to a Bazooka Double Bubble Gum wrapper, to Lichtenstein, "You can't teach color from Cézanne, you can only teach it from something like this." Lichtenstein then showed him one of his Donald Duck images.[9]

During the comic book phase of his career, Lichtenstein often slightly altered the colorization of the original source.[10] According to Marco Livingstone, his early comic subjects comprise a "loose and improvised style clearly derived from de Kooning." [1] Art historian Jonathan Fineberg, describes Lichtenstein's 1960 as an "...abstract expressionist picture with Mickey Mouse in it, related stylistically to the de Kooning Women".[11] When Leo Castelli saw both Lichtenstein's and Warhol's large comic strip-based works, he elected to show only Lichtenstein's, causing Warhol to create the Campbell's Soup Cans series to avoid competing with the more refined style of comics Lichtenstein was then producing.[12][13] He once said "I've got to do something that really will have a lot of impact that will be different enough from Lichtenstein and James Rosenquist, that will be very personal, that won't look like I'm doing exactly what they're doing." [14] Lichtenstein's foray into comics led to the abandonment of the topic by Warhol.[15] Although Lichtenstein continued to work with comic sources, after 1961 he avoided the easily identified sources like Popeye and Mickey Mouse.[16]

During autumn 1961, Allan Kaprow, a fellow teacher at Rutgers University, introduced Lichtenstein to art dealer Ivan Karp, the director of the Leo Castelli Gallery. Lichtenstein showed Karp several paintings, but not Look Mickey. He instead impressed him with Girl with Ball, and Karp decided to represent Lichtenstein a few weeks later.[3]

[edit] Description

The painting is one of Lichtenstein's first non-expressionist works, and marks his initial employment of Ben-Day dots which he used to give it an "industrial" half-tone effect. The painting is his first use both of a speech balloon[3] and comics as source material.[17] The work has visible pencil marks and was produced using a plastic-bristle dog brush to apply the oil paint onto the canvas.[3]

"It occurred to me one day to do something that would appear to be just the same as a comic book illustration without employing the then current symbols of art: the thick and thin paint, the calligraphic line and all that had become the hallmark of painting in the 1940s and '50s. I would make marks that would remind one of a real comic strip."

â ~Lichtenstein on the germination of his style[18]

In reproducing a mass-produced illustration in a painterly style, Lichtenstein simplifies by reducing the composition to primary colors, which serves to accentuate its mass appeal and largely gives it the "pop" look.[4] Typically, Ben-Day dots enable an artist to produce a variety of colors by using dots of a few colors to give the illusion of a broader pallet. By mixing dots of different colors, like an ink jet printer, just a few colors can create a broad spectrum using only a limited number of primary hues. Lichtenstein as a painter and not a mass production printer is able to avoid this, achieving his individual color tones without blending existing hues. Instead, for each color that he wanted to include in a work, he used that color paint.[19]

Lichtenstein made several alterations to the original work: he eliminated various non-essential figures and rotated the dock so that Donald looks off the side rather than the end. At the same time, he kept Donald and Mickey in almost the same positions as they were in the original.[20] Lichtenstein not only redesigned the space, but also altered the position of Donald's body and fishing rod for better balance and eliminated signs of stress and exertion to form a meticulous composition.[21] Walt Disney said about Donald Duck: "He's got a big mouth, a big belligerent eye, a twistable neck and a substantial backside that's highly flexible. The duck comes near being the animator's ideal subject." [22] Lichtenstein's painting reflects many of these physical features.[23]

Compared to the original source, Donald leans further forward towards the water, and Mickey less so. Mickey's face is more flushed, seemingly less from exertion, than embarrassment for and perhaps schadenfreude towards Donald.[24] The composition incorporates some of the foibles of comic book printing, including misaligning the joining of the contours of the waves with the yellow sky to give rise to an area of white space.[19]

[edit] Interpretation

The large scale reproduction of a comic strip frame was considered radical and revolutionary at the time.[25] Critics applauded the work's playfulness, inherent humour and irreverence. According to Diane Waldman of the Solomon R. Guggenheim Museum, "Look Mickey is broad comedy and falls into the category of slapstick" ... [26] Lichtenstein's slight alterations to its of "linear clarity and colour", the critic writes, adds to its aesthetic value and grandeur, reinforced by his choice of scale.[27] A common misconception about Lichtenstein comes from the fact that in his best known works, his meticulous approach to painting is purposely disguised because he superficially seeks his paintings to appear as if facsimiles of industrial produced pop culture icons.[21] Graham Bader wrote that "Lichtenstein's painting in fact appears more the product of industrial manufacture than the very pulp image on which it is based." [28] Look Mickey is considered self-referential in the sense that the artist is painting something through which the viewer may see elements of the artist.[29]

Bader observes that Look Mickey is concerned both with the artistic process and Lichtenstein's new painting techniques. He believes it can be considered a self-portrait in the sense that it "explicitly situates the painting's maker himself within the self-enclosed narcissistic circuit at its center". The painting shows Donald looking into the reflective water at Lichtenstein's blue 'rfl' signature "as a kind of surrogate for the image's creator", in a manner that is reminiscent of Caravaggio's Narcissus, in which the subject gazes at his own reflection on the water.[29] This is viewed as an allegory of Lichtenstein's position as an artist trained to develop his realist instincts despite the prominence of abstract expressionism. When viewed this way, Mickey serves as the "vanguard modernist" superego towering over Lichtenstein and laughing at his retrograde efforts.[24]

Lichtenstein uses red Ben-Day dots to color Mickey's face. According to some art critics, this gives the character the appearance of blushing, a

socio-psychosomatic reflex that is typically experienced when we are conscious of how we appear to others. Other interpretations are that the coloration is merely skin pigmentation or that it is the hue associated with a "healthy glow", since Mickey has historically been viewed as a creature with skin rather than fur.[30] Another interpretation â ^ supported by the original source in which Mickey says that if Donald can land the fish he can have it for lunch â ^ is that Mickey's face is red due to the exertion necessary to contain his disbelief and laughter while he experiences his amused superiority.[24] Those adhering to the blushing interpretation are bolstered by the uneven blotchiness of the red dots, but others are quick to point out that Lichtenstein's Ben-Day dot technique was still in a primitive stage. He did not develop the use of a stencil (i.e. the technique of pressing the liquid paint onto the surface through a screen of dots) to present uniformly distributed dots until 1963.[31]

"it is precisely this tensionâ ~between heightened sensation and absolute numbness, bodily exuberance and the deadening of sensory experienceâ ~that animates Look Mickey."

Graham Bader, describing it as the engine of the painting's narrative, notes the intrigue created by the juxtaposition of Donald's heightened sense of visual perception as it relates to his anticipated catch, and his deadened sense of tactile perception as it relates to having a fishing hook in the back of his own shirt. In this sense, Lichtenstein has chosen to depict a source that has as its subject a divide between raised visual awareness and an absent sense of touch:[32]

Donald is an explicitly divided subject, all sensory experience on one end and, literally, numbness on the other (and, visually, all depth and all flatness â ^ for Donald's face is by far the painting's most spatially illusionistic element, while his caught jacket, merged with the schematic waves behind it, emphatically one of its flattest). Indeed, Donald is a portrait of precisely the separation of sight and feeling, vision and touchâ | What divides vision and touch in Look Mickey, what marks this shift between them, is text: the words that Donald (and Lichtenstein) introduces to the scene, and which the duck's pole-cum-brush passes through before snagging his own back end.

Lichtenstein frequently explored vision-related themes after he began to work in the pop art genre; early examples include I Can See the Whole Room...and There's Nobody in It! and Look Mickey.[33] In this painting, Donald's large eyes indicate his belief that he has caught something big, while Mickey's small eyes indicate his disbelief that Donald has caught anything significant.[34] Like Lichtenstein's works with subjects looking through a periscope (Torpedo...Los!), a mirror (Girl in Mirror) or a peephole (I Can See the Whole Room... and There's Nobody in It!), Look Mickey, with a subject looking at his reflection in the water, is a prominent example of the theme of vision. He uses narrative to emphasize this motif, while presenting several visual elements.[33]

[edit] Legacy

The paintings was included Lichtenstein's first solo exhibition at The Leo Castelli Gallery, a show in which all the works had pre-sold before its opening in February 1962.[7][35] He included the painting in his Artist's Studioâ ~Look Mickey (1973), showing it hanging prominently on the wall of the pictorial space intended to depict his studio as the ideal studio, and imply that his popularity with critic and public ratifies his choice of popular culture subject matter.[36] Reflecting on Look Mickey many years later, he said:

The idea of doing [a cartoon painting] without apparent alteration just occurred to me ... and I did one really almost half seriously to get an idea of what it might look like. And as I was painting this painting I kind of got interested in organizing it as a painting and brought it to some kind of conclusion as an aesthetic statement, which I hadn't really intended to do to begin with. And then I really went back to my other kind of painting, which was pretty abstract. Or tried to. But I had this cartoon painting in my studio, and it was a little too formidable. I couldn't keep my eyes off it, and it sort of prevented me from painting in any other way, and then I decided this stuff was really serious ... I would say I had it on my easel for a week. I would just want to see what it looked like. I tried to make it a work of art. I wasn't trying just to copy. I realized that this was just so much more compelling.

The painting was bequeathed to the Washington National Gallery of Art after Lichtenstein's death in 1997, following a 1990 pledge in honor of the institution's 50th Anniversary.[4][37] It remains in the gallery's collection, where, as of November 2012[update], it is on permanent view.[4]

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[edit] External links

Knights Templar
 Poor Fellow-Soldiers of Christ and of the Temple of Solomon
 Pauperes commilitones Christi Templique Salomonici
 A Seal of the Knights Templar[1]
 Active
 c. 1119–1312
 Allegiance
 The Pope
 Type
 Western Christian military order
 Role
 Protection of Christian Pilgrims
 Size
 15,000–20,000 members at peak, 10% of whom were knights[2][3]
 Headquarters
 Temple Mount, Jerusalem
 Nickname
 Order of the Temple
 Patron
 St. Bernard of Clairvaux
 Motto
 Non nobis Domine, non nobis, sed nomini tuo da gloriam (Not to us Lord, not to us, but to Your Name give the glory)
 Attire
 White mantle with a red cross
 Mascot
 2 Knights riding a single horse
 Engagements

The Crusades, including: Siege of Ascalon (1153), Battle of Montgisard (1177), Battle of Marj Ayyun (1179), Battle of Hattin (1187), Siege of Acre (1190â ~1191), Battle of Arsuf (1191), Siege of Al-Dã mÅ«s (1210), Battle of Legnica (1241), Siege of Acre (1291), Reconquista

Commanders

First Grand Master

Hugues de Payens

Last Grand Master

Jacques de Molay

The Poor Fellow-Soldiers of Christ and of the Temple of Solomon (Latin: *Pauperes commilitones Christi Templique Salomonici*), commonly known as the Knights Templar, the Order of the Temple (French: *Ordre du Temple* or *Templiers*) or simply as Templars, were among the most famous of the Western Christian military orders.[4] The organisation existed for nearly two centuries during the Middle Ages.

Officially endorsed by the Catholic Church around 1129, the Order became a favoured charity throughout Christendom and grew rapidly in membership and power. Templar knights, in their distinctive white mantles with a red cross, were among the most skilled fighting units of the Crusades.[5] Non-combatant members of the Order managed a large economic infrastructure throughout Christendom, innovating financial techniques that were an early form of banking,[6][7] and building fortifications across Europe and the Holy Land.

The Templars' existence was tied closely to the Crusades; when the Holy Land was lost, support for the Order faded. Rumours about the Templars' secret initiation ceremony created mistrust and King Philip IV of France, deeply in debt to the Order, took advantage of the situation. In 1307, many of the Order's members in France were arrested, tortured into giving false confessions, and then burned at the stake.[8] Under pressure from King Philip, Pope Clement V disbanded the Order in 1312. The abrupt disappearance of a major part of the European infrastructure gave rise to speculation and legends, which have kept the "Templar" name alive into the modern day.

[edit] History

After the First Crusade recaptured Jerusalem in 1099, many Christian pilgrims travelled to visit what they referred to as the Holy Places. However, though the city of Jerusalem was under relatively secure control, the rest of Outremer was not. Bandits abounded, and pilgrims were routinely slaughtered, sometimes by the hundreds, as they attempted to make the journey from the coastline at Jaffa into the Holy Land.[9]

Around 1119, the French knight Hugues de Payens approached King Baldwin II of Jerusalem with the proposal of creating a monastic order for the protection of these pilgrims. King Baldwin agreed to the request, and granted space for a headquarters in a wing of the royal palace on the Temple Mount, in the captured Al-Aqsa Mosque. The Temple Mount had a mystique because it was above what was believed to be the ruins of the Temple of Solomon.[5][10] The Crusaders therefore referred to the Al Aqsa Mosque as Solomon's Temple, and it was from this location that the new Order took the name of Poor Knights of Christ and the Temple of Solomon, or "Templar" knights. The Order, with about nine knights including Godfrey de Saint-Omer and Andr   de Montbard, had few financial resources and relied on donations to survive. Their emblem was of two knights riding on a single horse, emphasising the Order's poverty.[11]

A Templar Knight is truly a fearless knight, and secure on every side, for his soul is protected by the armour of faith, just as his body is protected by the armour of steel. He is thus doubly armed, and need fear neither demons nor men."

Bernard de Clairvaux, c. 1135, *De Laude Novae Militae*â ~In Praise of the New

The Templars' impoverished status did not last long. They had a powerful advocate in Saint Bernard of Clairvaux, a leading Church figure and a nephew of Andr   de Montbard, one of the founding knights. Bernard spoke and wrote persuasively on their behalf and, in 1129, at the Council of Troyes the Order was officially endorsed by the Church. With this formal blessing, the Templars became a favoured charity throughout Christendom, receiving money, land, businesses, and noble-born sons from families who were eager to help with the fight in the Holy Land. Another major benefit came in 1139, when Pope Innocent II's papal bull *Omne Datum Optimum* exempted the Order from obedience to local laws. This ruling meant that the Templars could pass freely through all borders, were not required to pay any taxes, and were exempt from all authority except that of the pope.[13]

With its clear mission and ample resources, the Order grew rapidly. Templars were often the advance force in key battles of the Crusades, as the heavily armoured knights on their warhorses would set out to charge at the enemy, in an attempt to break opposition lines. One of their most famous victories was in 1177 during the Battle of Montgisard, where some 500 Templar knights helped several thousand infantry to defeat Saladin's army of more than 26,000 soldiers.[14]

Although the primary mission of the Order was military, relatively few members were combatants. The others acted in support positions to assist the knights and to manage the financial infrastructure. The Templar Order, though its members were sworn to individual poverty, was given control of wealth beyond direct donations. A nobleman who was interested in participating in the Crusades might place all his assets under Templar management while he was away. Accumulating wealth in this manner throughout Christendom and the Outremer, the Order in 1150 began generating letters of credit for pilgrims journeying to the Holy Land: pilgrims deposited their valuables with a local Templar preceptory before embarking, received a document indicating the value of their deposit, then used that document upon arrival in the Holy Land to retrieve their funds. This innovative arrangement was an early form of banking, and may have been the first formal system to support the use of cheques; it improved the safety of pilgrims by making them less attractive targets for thieves, and also contributed to the Templar coffers.[5][15]

Based on this mix of donations and business dealing, the Templars established financial networks across the whole of Christendom. They acquired large tracts of land, both in Europe and the Middle East; they bought and managed farms and vineyards; they built churches and castles; they were involved in manufacturing, import and export; they had their own fleet of ships; and at one point they even owned the entire island of Cyprus. The Order of the Knights Templar arguably qualifies as the world's first multinational corporation.[14][16][17]

[edit] Decline

In the mid-12th century, the tide began to turn in the Crusades. The Muslim world had become more united under effective leaders such as Saladin, and dissension arose among Christian factions in and concerning the Holy Land. The Knights Templar were occasionally at odds with the two other Christian military orders, the Knights Hospitaller and the Teutonic Knights, and decades of internecine feuds weakened Christian positions, politically and militarily. After the Templars were involved in several unsuccessful campaigns, including the pivotal Battle of the Horns of Hattin, Jerusalem was captured by Saladin's forces in 1187. The Crusaders retook the city in 1229, without Templar aid, but held it only briefly. In 1244, the Khwarezmi Turks recaptured Jerusalem, and the city did not return to Western control until 1917 when the British captured it from the Ottoman Turks.[18]

The Templars were forced to relocate their headquarters to other cities in the north, such as the seaport of Acre, which they held for the next century. But they lost that, too, in 1291, followed by their last mainland strongholds,

Tortosa (Tartus in what is now Syria), and Atlit in present-day Israel. Their headquarters then moved to Limassol on the island of Cyprus,[19] and they also attempted to maintain a garrison on tiny Arwad Island, just off the coast from Tortosa. In 1300, there was some attempt to engage in coordinated military efforts with the Mongols[20] via a new invasion force at Arwad. In 1302 or 1303, however, the Templars lost the island to the Egyptian Mamluks in the Siege of Arwad. With the island gone, the Crusaders lost their last foothold in the Holy Land.[14][21]

With the Order's military mission now less important, support for the organisation began to dwindle. The situation was complex though, as over the two hundred years of their existence, the Templars had become a part of daily life throughout Christendom.[22] The organisation's Templar Houses, hundreds of which were dotted throughout Europe and the Near East, gave them a widespread presence at the local level.[3] The Templars still managed many businesses, and many Europeans had daily contact with the Templar network, such as by working at a Templar farm or vineyard, or using the Order as a bank in which to store personal valuables. The Order was still not subject to local government, making it everywhere a "state within a state"~its standing army, though it no longer had a well-defined mission, could pass freely through all borders. This situation heightened tensions with some European nobility, especially as the Templars were indicating an interest in founding their own monastic state, just as the Teutonic Knights had done in Prussia[15] and the Knights Hospitaller were doing with Rhodes.[23]

[edit] Arrests, charges and dissolution

In 1305, the new Pope Clement V, based in France, sent letters to both the Templar Grand Master Jacques de Molay and the Hospitaller Grand Master Fulk de Villaret to discuss the possibility of merging the two Orders. Neither was amenable to the idea, but Pope Clement persisted, and in 1306 he invited both Grand Masters to France to discuss the matter. De Molay arrived first in early 1307, but de Villaret was delayed for several months. While waiting, De Molay and Clement discussed charges that had been made two years prior by an ousted Templar. It was generally agreed that the charges were false, but Clement sent King Philip IV of France a written request for assistance in the investigation. King Philip was already deeply in debt to the Templars from his war with the English and decided to seize upon the rumors for his own purposes. He began pressuring the Church to take action against the Order, as a way of freeing himself from his debts.[24]

On Friday, 13 October 1307 (a date sometimes spuriously linked with the origin of the Friday the 13th superstition and October surprise)[25][26] Philip ordered de Molay and scores of other French Templars to be simultaneously arrested. The arrest warrant started with the phraseÂ : "Dieu n'est pas content, nous avons des ennemis de la foi dans le Royaume" ["God is not pleased. We have enemies of the faith in the kingdom"].[27] The Templars were charged with numerous offences (including apostasy, idolatry, heresy, obscene rituals and homosexuality, financial corruption and fraud, and secrecy).[28] Many of the accused confessed to these charges under torture, and these confessions, even though obtained under duress, caused a scandal in Paris. All interrogations were recorded on a thirty metre long parchment, kept at the "Archives nationales" in Paris. The prisoners were coerced to confess that they had spat on the CrossÂ : "Moi Raymond de La FÃ~re, 21 ans, reconnais que (J'ai) crachÃ© trois fois sur la Croix, mais de bouche et pas de coeur" (free translationÂ : "I, Raymond de La FÃ~re, 21 years old, admit that I have spat three times on the Cross, but only from my mouth and not from my heart"). The Templars were accused of idolatry.[29]

After more bullying from Philip, Pope Clement then issued the papal bull *Pastoralis Praeeminentiae* on 22 November 1307, which instructed all Christian monarchs in Europe to arrest all Templars and seize their assets.[30]

Pope Clement called for papal hearings to determine the Templars' guilt or innocence, and once freed of the Inquisitors' torture, many Templars recanted their confessions. Some had sufficient legal experience to defend themselves in

the trials, but in 1310 Philip blocked this attempt, using the previously forced confessions to have dozens of Templars burned at the stake in Paris.[31][32]

With Philip threatening military action unless the pope complied with his wishes, Pope Clement finally agreed to disband the Order, citing the public scandal that had been generated by the confessions. At the Council of Vienne in 1312, he issued a series of papal bulls, including Vox in excelso, which officially dissolved the Order, and Ad providam, which turned over most Templar assets to the Hospitallers.[34]

As for the leaders of the Order, the elderly Grand Master Jacques de Molay, who had confessed under torture, retracted his confession. Geoffroi de Charney, Preceptor of Normandy, also retracted his confession and insisted on his innocence. Both men were declared guilty of being relapsed heretics, and they were sentenced to burn alive at the stake in Paris on 18 March 1314. De Molay reportedly remained defiant to the end, asking to be tied in such a way that he could face the Notre Dame Cathedral and hold his hands together in prayer.[35] According to legend, he called out from the flames that both Pope Clement and King Philip would soon meet him before God. His actual words were recorded on the parchment as follows: "Dieu sait qui a tort et a pÃ©chÃ©. Il va bientot arriver malheur Ã ceux qui nous ont condamnÃ©s Ã mort" (free translation: "God knows who is wrong and has sinned. Soon a calamity will occur to those who have condemned us to death").[27] Pope Clement died only a month later, and King Philip died in a hunting accident before the end of the year.[36][37][38]

With the last of the Order's leaders gone, the remaining Templars around Europe were either arrested and tried under the Papal investigation (with virtually none convicted), absorbed into other military orders such as the Knights Hospitaller, or pensioned and allowed to live out their days peacefully. By papal decree, the property of the Templars was transferred to the Order of Hospitallers, which also absorbed many of the Templars' members. In effect, the dissolution of the Templars could be seen as the merger of the two rival orders.[39] Some may have fled to other territories outside Papal control, such as excommunicated Scotland or to Switzerland. Templar organisations in Portugal simply changed their name, from Knights Templar to Knights of Christ â€” see Order of Christ (Portugal).[40]

[edit] Chinon Parchment

In September 2001, a document known as the "Chinon Parchment" dated 17â€”20 August 1308 was discovered in the Vatican Secret Archives by Barbara Frale, apparently after having been filed in the wrong place in 1628. It is a record of the trial of the Templars and shows that Clement absolved the Templars of all heresies in 1308 before formally disbanding the Order in 1312,[41] as did another Chinon Parchment dated 20 August 1308 addressed to Philip IV of France, also mentioning that all Templars that had confessed to heresy were "restored to the Sacraments and to the unity of the Church". This other Chinon Parchment has been well known to historians [42][43][44] having been published by Tienne Baluze in 1693,[45] and by Pierre Dupuy in 1751.[46]

The current position of the Roman Catholic Church is that the medieval persecution of the Knights Templar was unjust, that nothing was inherently wrong with the Order or its Rule, and that Pope Clement was pressed into his actions by the magnitude of the public scandal and by the dominating influence of King Philip IV, who was Clement's relative.[47][48]

[edit] Organisation

The Templars were organised as a monastic order similar to Bernard's Cistercian Order, which was considered the first effective international organization in Europe.[49] The organizational structure had a strong chain of authority. Each country with a major Templar presence (France, England, Aragon, Portugal, Poitou, Apulia, Jerusalem, Tripoli, Antioch, Anjou, Hungary, and Croatia)[50] had a Master of the Order for the Templars in that region.

All of them were subject to the Grand Master, appointed for life, who oversaw both the Order's military efforts in the East and their financial holdings in the West. The Grand Master exercised his authority via the visitors-general of

the order, who were knights specially appointed by the Grand Master and convent of Jerusalem to visit the different provinces, correct malpractices, introduce new regulations, and resolve important disputes. The visitors-general had the power to remove knights from office and to suspend the Master of the province concerned.

No precise numbers exist, but it is estimated that at the Order's peak there were between 15,000 and 20,000 Templars, of whom about a tenth were actual knights.[2][3]

[edit] Ranks within the order

[edit] Three main ranks

There was a threefold division of the ranks of the Templars: the aristocratic knights, the lower-born sergeants, and the clergy. Knights were required to be of knightly descent and to wear white mantles. They were equipped as heavy cavalry, with three or four horses and one or two squires. Squires were generally not members of the Order but were instead outsiders who were hired for a set period of time. Beneath the knights in the Order and drawn from lower social strata were the sergeants.[51] They were either equipped as light cavalry with a single horse[52] or served in other ways such as administering the property of the Order or performing menial tasks and trades. Chaplains, constituting a third Templar class, were ordained priests who saw to the Templar's' spiritual needs.[53]

[edit] Grand Masters

Starting with founder Hugues de Payens in 1118â ^1119, the Order's highest office was that of Grand Master, a position which was held for life, though considering the martial nature of the Order, this could mean a very short tenure. All but two of the Grand Masters died in office, and several died during military campaigns. For example, during the Siege of Ascalon in 1153, Grand Master Bernard de Tremelay led a group of 40 Templars through a breach in the city walls. When the rest of the Crusader army did not follow, the Templars, including their Grand Master, were surrounded and beheaded.[54] Grand Master GÃ©rard de Ridefort was beheaded by Saladin in 1189 at the Siege of Acre.

The Grand Master oversaw all of the operations of the Order, including both the military operations in the Holy Land and Eastern Europe and the Templars' financial and business dealings in Western Europe. Some Grand Masters also served as battlefield commanders, though this was not always wise: several blunders in de Ridefort's combat leadership contributed to the devastating defeat at the Battle of Hattin. The last Grand Master was Jacques de Molay, burned at the stake in Paris in 1314 by order of King Philip IV.[32]

[edit] Behaviour and dress

It was Bernard de Clairvaux and founder Hugues de Payens who devised the specific code of behaviour for the Templar Order, known to modern historians as the Latin Rule. Its 72 clauses defined the ideal behaviour for the Knights, such as the types of garments they were to wear and how many horses they could have. Knights were to take their meals in silence, eat meat no more than three times per week, and not have physical contact of any kind with women, even members of their own family. A Master of the Order was assigned "4 horses, and one chaplain-brother and one clerk with three horses, and one sergeant brother with two horses, and one gentleman valet to carry his shield and lance, with one horse." [55] As the Order grew, more guidelines were added, and the original list of 72 clauses was expanded to several hundred in its final form.[56][57]

The knights wore a white surcoat with a red cross and a white mantle; the sergeants wore a black tunic with a red cross on front and back and a black or brown mantle.[58][59] The white mantle was assigned to the Templars at the Council of Troyes in 1129, and the cross was most probably added to their robes at the launch of the Second Crusade in 1147, when Pope Eugenius III, King Louis VII of France, and many other notables attended a meeting of the French Templars at their headquarters near Paris.[60][61][62] According to their Rule, the knights were to wear the white mantle at all times, even being forbidden to eat or drink unless they were wearing it.[63]

The red cross that the Templars wore on their robes was a symbol of martyrdom,

and to die in combat was considered a great honor that assured a place in heaven.[64] There was a cardinal rule that the warriors of the Order should never surrender unless the Templar flag had fallen, and even then they were first to try to regroup with another of the Christian orders, such as that of the Hospitallers. Only after all flags had fallen were they allowed to leave the battlefield.[65] This uncompromising principle, along with their reputation for courage, excellent training, and heavy armament, made the Templars one of the most feared combat forces in medieval times.[66]

Initiation,[67] known as Reception (receptio) into the Order, was a profound commitment and involved a solemn ceremony. Outsiders were discouraged from attending the ceremony, which aroused the suspicions of medieval inquisitors during the later trials.

New members had to willingly sign over all of their wealth and goods to the Order and take vows of poverty, chastity, piety, and obedience.[68] Most brothers joined for life, although some were allowed to join for a set period. Sometimes a married man was allowed to join if he had his wife's permission,[59] but he was not allowed to wear the white mantle.[69]

[edit] Legacy

With their military mission and extensive financial resources, the Knights Templar funded a large number of building projects around Europe and the Holy Land. Many of these structures are still standing. Many sites also maintain the name "Temple" because of centuries-old association with the Templars.[70] For example, some of the Templars' lands in London were later rented to lawyers, which led to the names of the Temple Bar gateway and the Temple tube station. Two of the four Inns of Court which may call members to act as barristers are the Inner Temple and Middle Temple.

Distinctive architectural elements of Templar buildings include the use of the image of "two knights on a single horse", representing the Knights' poverty, and round buildings designed to resemble the Church of the Holy Sepulchre in Jerusalem.[71]

[edit] Modern organizations

The story of the secretive yet powerful medieval Templars, especially their persecution and sudden dissolution, has been a tempting source for many other groups which have used alleged connections with the Templars as a way of enhancing their own image and mystery.[72] There is no clear historical connection between the Knights Templar, which were dismantled in the Roll's of the Catholic Church in the 1309 with the martyrdom of Jacques de Molay, and any of the modern organizations, of which, except for the publicly known Scottish Order, the earliest emerged publicly in the 18th century.[73][74][75][76] However, there is often public confusion and many overlook the 400-year gap.

[edit] Freemasonry

Since at least the 18th century Freemasonry has incorporated Templar symbols and rituals in a number of Masonic bodies,[5] most notably, the "Order of the Temple" the final order joined in "The United Religious, Military and Masonic Orders of the Temple and of St John of Jerusalem, Palestine, Rhodes and Malta" commonly known as the Knights Templar. One theory of the origins of Freemasonry claims direct descent from the historical Knights Templar through its final fourteenth-century members who took refuge in Scotland whose King, Robert the Bruce was excommunicated by the Roman Catholic Church at the time, or in Spain who for a time were called Knights of Christ Cross, other members having joined Knights of St. John There have even been claims that some of the Templars who made it to Scotland contributed to the Scots' victory at Bannockburn. This theory is usually deprecated on grounds of lack of evidence, by both Masonic authorities[77] and historians.[78]

[edit] Legends and relics

The Knights Templar have become associated with legends concerning secrets and mysteries handed down to the select from ancient times. Rumors circulated even during the time of the Templars themselves. Freemasonic writers added their own speculations in the 19th century, and further fictional embellishments have been added in popular novels such as *Ivanhoe*, *Foucault's Pendulum*, *The Lost*

symbol, and The Da Vinci Code;[5] modern movies such as National Treasure and Indiana Jones and the Last Crusade; and video games such as Assassin's Creed and Broken Sword.[79]

Many of the Templar legends are connected with the Order's early occupation of the Temple Mount in Jerusalem and speculation about what relics the Templars may have found there, such as the Holy Grail or the Ark of the Covenant.[5][15][66][80] That the Templars were in possession of some relics is certain. Many churches still display holy relics such as the bones of a saint, a scrap of cloth once worn by a holy man, or the skull of a martyr; the Templars did the same. They were documented as having a piece of the True Cross, which the Bishop of Acre carried into battle at the disastrous Horns of Hattin.[81] When the battle was lost, Saladin captured the relic, which was then ransomed back to the Crusaders when the Muslims surrendered the city of Acre in 1191.[82] The Templars were also known to possess the head of Saint Euphemia of Chalcedon,[83] and the subject of relics came up during the Inquisition of the Templars, as several trial documents refer to the worship of an idol of some type, referred to in some cases as a cat, a bearded head, or in some cases as Baphomet. This accusation of idol worship levied against the Templars has also led to the modern belief by some that the Templars practiced witchcraft.[84] However, modern scholars generally explain the name Baphomet from the trial documents as simply a French misspelling of the name Mahomet (Muhammad).[5][85]

The Holy Grail quickly became associated with the Templars, even in the 12th century. The first Grail romance, *Le Conte du Graal*, was written around 1180 by Chrétien de Troyes, who came from the same area where the Council of Troyes had officially sanctioned the Templars' Order. Perhaps twenty years later Parzival, Wolfram von Eschenbach's version of the tale, refers to knights called "Templeisen" guarding the Grail Kingdom.[86] Another hero of the Grail quest, Sir Galahad (a 13th-century literary invention of monks from St. Bernard's Cistercian Order) was depicted bearing a shield with the cross of Saint George, similar to the Templars' insignia: this version presented the "Holy" Grail as a Christian relic. A legend developed that since the Templars had their headquarters at the Temple Mount in Jerusalem, they must have excavated in search of relics, found the Grail, and then proceeded to keep it in secret and guard it with their lives. However, in the extensive documents of the Templar inquisition there was never a single mention of anything like a Grail relic,[14] let alone its possession by the Templars, nor is there any evidence that a Templar wrote a Grail Romance.[87] In reality, most mainstream scholars agree that the story of the Grail was just that, a literary fiction that began circulating in medieval times.[5][15]

Another legendary object that is claimed to have some connection with the Templars is the Shroud of Turin. In 1357, the shroud was first publicly displayed by a nobleman known as Geoffrey of Charney,[88] described by some sources as being a member of the family of the grandson of Geoffroi de Charney, who was burned at the stake with De Molay.[89] The shroud's origins are still a matter of controversy, but in 1988, a carbon dating analysis concluded that the shroud was made between 1260 and 1390, a span that includes the last half-century of the Templars' existence.[90] The validity of the dating methodology has subsequently been called into question, and the age of the shroud is still the subject of much debate[91] despite the existence of a 1389 Memorandum by Bishop Pierre D'Arcis to the Avignon Antipope Clement VII mentioning that the image had previously been denounced by his predecessor Henri de Poitiers (Bishop of Troyes 1353-1370), stating "Eventually, after diligent inquiry and examination, he discovered how the said cloth had been cunningly painted, the truth being attested by the artist who had painted it, to wit, that it was a work of human skill and not miraculously wrought or bestowed." [92]

^ as reproduced in T. A. Archer, *The Crusades: The Story of the Latin Kingdom of Jerusalem* (1894), p. 176. The design with the two knights on a horse and the

inscription SIGILLVM MILITVM XRISTI is attested in 1191, see Jochen Burgtorf, *The central convent of Hospitallers and Templars: history, organization, and personnel (1099/1120-1310)*, Volume 50 of *History of warfare* (2008), ISBN 978-90-04-16660-8, pp. 545-546.

^ a b Burman, p. 45.

^ a b c Barber, in "Supplying the Crusader States" says, "By Molay's time the Grand Master was presiding over at least 970 houses, including commanderies and castles in the east and west, serviced by a membership which is unlikely to have been less than 7,000, excluding employees and dependents, who must have been seven or eight times that number."

^ Malcolm Barber, *The New Knighthood: A History of the Order of the Temple*. Cambridge University Press, 1994. ISBN 0-521-42041-5.

^ a b c d e f g h The History Channel, *Decoding the Past: The Templar Code*, 7 November 2005, video documentary written by Marcy Marzuni.

^ Martin, p. 47.

^ Nicholson, p. 4.

^ Malcolm Barber, *The Trial of the Templars*. Cambridge University Press, 1978. ISBN 0-521-45727-0.

^ Burman, pp. 13, 19.

^ Barber, *The New Knighthood*, p. 7.

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^ Stephen A. Dafoe. "In Praise of the New Knighthood". *TemplarHistory.com*. <http://www.templarhistory.com/praise.html>. Retrieved March 20, 2007.

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^ Martin, p. 99.

^ Martin, p. 113.

^ Demurger, p.139 "During four years, Jacques de Molay and his order were totally committed, with other Christian forces of Cyprus and Armenia, to an enterprise of reconquest of the Holy Land, in liaison with the offensives of Ghazan, the Mongol Khan of Persia.

^ Nicholson, p. 201. "The Templars retained a base on Arwad island (also known as Ruad island, formerly Arados) off Tortosa (Tartus) until October 1302 or 1303, when the island was recaptured by the Mamluks."

^ Nicholson, p. 5.

^ Nicholson, p. 237.

^ Barber, *Trial of the Templars*, 2nd ed. "Recent Historiography on the Dissolution of the Temple." In the second edition of his book, Barber summarises the views of many different historians, with an overview of the modern debate on Philip's precise motives.

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^ Martin, pp. 123â ^124.

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^ In The New Knighthood Barber referred to a variant of this legend, about how an unspecified Templar had appeared before and denounced Clement V and, when he was about to be executed sometime later, warned that both Pope and King would "within a year and a day be obliged to explain their crimes in the presence of God", found in the work by Ferretto of Vicenza, Historia rerum in Italia gestarum ab anno 1250 ad annum usque 1318 (Malcolm Barber, The New Knighthood, pages 314-315, Cambridge University Press, 1994). ISBN 0-521-55872-7

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^ a b Burman, p. 44.

^ Barber, *The New Knighthood*, page 66: "According to William of Tyre it was under Eugenius III that the Templars received the right to wear the characteristic red cross upon their tunics, symbolising their willingness to suffer martyrdom in the defence of the Holy Land." (WT, 12.7, p. 554. James of Vitry, *'Historia Hierosolimatana'*, ed. J. ars, *Gesta Dei per Francos*, vol I(ii), Hanover, 1611, p. 1083, interprets this as a sign of martyrdom.)

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[edit] External links

Ima Hogg (July 10, 1882 â ^ August 19, 1975), known as "The First Lady of Texas",^[1] was an American philanthropist, patron and collector of the arts, and one of the most respected women in Texas during the 20th century.^[2] Hogg was an avid art collector, and owned works by Picasso, Klee, and Matisse, among others. Hogg donated hundreds of pieces of artwork to Houston's Museum of Fine Arts and served on a committee to plan the Kennedy Center in Washington, D.C. An enthusiastic collector of early American antiques, she also served on a committee tasked with locating historical furniture for the White House. She restored and refurbished several properties, including the Varner plantation and Bayou Bend, which she later donated to Texas arts and historical institutions who maintain the facilities and their collections today. Hogg received numerous awards and honors, including the Louise E. du Pont Crowninshield Award from the National Trust for Historic Preservation, the Santa Rita Award from the University of Texas System, and an honorary doctorate in fine arts from Southwestern University.

Hogg was the daughter of Sarah Ann "Sallie" Stinson and James Stephen "Big Jim" Hogg, later Attorney General of Texas and Governor of the state. Ima Hogg's first name was taken from The Fate of Marvin, an epic poem written by her uncle Thomas Hogg. She endeavored to downplay her unusual name by signing her first name illegibly and having her stationery printed with "I. Hogg" or "Miss Hogg". Although it was rumored that Hogg had a sister named "Ura Hogg", she had only brothers. Hogg's father left public office in 1895, and soon after, her mother was diagnosed with tuberculosis. When Sarah died later that year, Jim Hogg's widowed elder sister moved to Austin to care for the Hogg children. Between 1899 and 1901, Hogg attended the University of Texas at Austin; she then moved to New York City to study piano and music theory for two years. After her father's death in 1906, she traveled to Europe and spent two years studying music under Xaver Scharwenka in Vienna. When she returned to Texas, she established and managed the Houston Symphony Orchestra and served as president of the Symphony Society.

The discovery of oil on her family's plantation made Hogg very wealthy, and she used this income to benefit the people of Texas. In 1929, she founded the Houston Child Guidance Center, which provides counseling for disturbed children and their families. Through her brother's will, she established the Hogg Foundation for Mental Health at the University of Texas at Austin in 1940. Hogg successfully ran for a seat on the Houston School Board in 1943, where she worked to remove gender and race as criteria for determining pay and established art education programs for black students. Hogg never married, and died in 1975. The Ima Hogg Foundation was the major beneficiary of her will, and carries on her philanthropic work today. Several annual awards have been established in her name, honoring her efforts to preserve cultural heritage in Texas.

After the birth of his only daughter, Jim Hogg wrote to his brother, "Our cup of joy is now overflowing! We have a daughter of as fine proportions and of as angelic mien as ever gracious nature favor a man with, and her name is Ima!"[3] Ima Hogg had no middle name, which was unusual for the time.[4] Her first name was taken from her uncle Thomas Hogg's epic Civil War poem *The Fate of Marvin*, which featured two young women named Ima and Leila.[4][5][6] According to Virginia Bernhard's biography of Ima Hogg, "there are some who believe that James Stephen Hogg ... named his only daughter Ima Hogg to attract the attention of Texas voters" in a year when he was running in a close race for district attorney of the Seventh District in Texas,[3] which he won.[7][8] Alternatively, correspondence from Jim Hogg indicates he may not have been conscious of the combined effect of his daughter's first and last names.[9]

Ima Hogg later recounted that "my grandfather Stinson lived fifteen miles [24 km] from Mineola and news traveled slowly. When he learned of his granddaughter's name he came trotting to town as fast as he could to protest but it was too late. The christening had taken place, and Ima I was to remain." [4] During her childhood, Hogg's elder brother William often came home from school with a bloody nose, the result of defending, as she later recalled, "my good name".[10] Throughout her adult years, Hogg signed her name in a scrawl that left her first name illegible. Her personal stationery was usually printed "Miss Hogg" or "I. Hogg", and she often had her stationery order placed in her secretary's name to avoid questions. Hogg did not use a nickname until several months before her death, when she began calling herself "Imogene". Her last passport was issued to "Ima Imogene Hogg".[10]

Contrary to popular belief, Ima did not have a sister named Ura.[11] Texas legend insists that when Jim Hogg ran for re-election as Texas governor in 1892 he often travelled with Ima and a friend of hers and introduced them as his daughters Ima and Ura. Ima Hogg maintained throughout her life that this never happened.[12] She was frequently forced to dispel the myth; hundreds of people wrote her letters inquiring whether her name was real and if she really had a sister named Ura.[10] The Kansas City Star even invented another sister, Hoosa.[13]

In the early 1930s, Hogg worked on a collection of her father's papers and speeches with his biographer, historian Robert C. Cotner; she became a guardian of his place in history, often writing to clarify or refute articles published about her father. According to Bernhard, "the very fact that Ima had been burdened with a name that made a lifetime of explanations necessary also made her anxious to defend her father from all detractors. By doing so, she defended herself as well, and she did so with considerable skill and unfailing politeness." [14]

Ima Hogg has been the source of "unfortunate name" or "worst baby name" jokes, lists, and contests,[15][16][17] including the incorrect lore that Jim Hogg had named his two daughters "Ima Hogg" and "Ura Hogg".[18][19] Similar unfortunate baby names according to United States Census records include Ima Pigg, Ima Muskrat, Ima Nut, Ima Hooker,[15] Ima Weiner, Ima Reck, Ima Pain and Ima Butt.[19]

[edit] Early years

Ima Hogg was born in Mineola, Texas in 1882 to Jim Hogg and Sarah Ann "Sallie"

Stinson. She was the second of four children, including brothers William Clifford Hogg (1875â ~1930), Michael Hogg (1885â ~1941), and Thomas Elisha Hogg (1887â ~1949).[11] The Hogg family had long been active in public service. Her great-grandfather, Thomas Hogg, served in the state legislatures of Georgia, Alabama, and Mississippi. Her grandfather, Joseph Lewis Hogg, served in the Congress of the Republic of Texas and helped to write the Texas State Constitution.[20] At the time of her birth, Hogg's father was the district attorney of the Seventh District in Texas.[21] His term expired in 1884, and the family moved to Tyler, where he practiced law. Two years later, Jim Hogg was elected Texas Attorney General and the Hogg family moved to the state capital, Austin, where Ima began attending kindergarten.[22] When Jim Hogg was elected the first native-born Governor of Texas four years later,[21] Ima accompanied her mother and elder brother to the swearing-in ceremony and inauguration ball in January 1891, thus witnessing the first inauguration in the newly erected Texas State Capitol.[23] The family moved into the Governor's Mansion. Built in 1855, the building was in poor condition, with cracked walls and dilapidated furnishings. Ima and her siblings were expected to help renovate the building to a liveable stateâ ~she was required, among other things, to pry chewing gum from the furniture and door moldings.[24]

Hogg and her younger brothers were rambunctious. She recalled that they particularly enjoyed sliding down the banisters in the Governor's Mansion. Hogg's parents allowed this to continue until Thomas cut his chin, after which Jim Hogg nailed tacks along the center of the railing to curb the activity through fear of bloodied posteriors; the holes from the tacks remained visible in the banister for many decades after the Hogg family moved from the home.[25] Hogg's mother attempted to teach her ladylike skills such as needlework, but Hogg claimed that she "never had the patience to succeed".[25] Her mother also encouraged Hogg to learn German. Hogg and her siblings were frequently taken to the Millet Opera House in Austin to enjoy the performances.[26]

The children liked animals, and their menagerie included dogs, cats, birds, raccoons, opossums, rabbits, a Shetland pony and a parrot.[27] The children once used their animals to conduct a circus on the grounds of the Governor's Mansion. Hogg charged each visitor five cents, but was forced to return the money when her father discovered the scheme.[28] In later years, the family added a bear, a horse, a fawn, cockatoos, and two ostriches named Jack and Jill to their collection of animals. In response to a challenge from her brothers, Hogg once mounted one of the ostriches, but was thrown from its back after one of the boys hit it with a slingshot.[29] Ima and her ostriches later became the protagonists of a picture book, Ima & the Great Texas Ostrich Race, by Margaret Olivia McManis and Bruce Dupree.[30]

Her mother never regained her strength after Thomas's birth, and for the remainder of her life was a semi-invalid.[25] Ima accompanied her to several health spas during their years in Austin.[31] In 1895, Sarah was diagnosed with tuberculosis, and on the recommendation of her doctor, she and Ima moved to Colorado, where they lived with Jim Hogg's elder sister, Martha Francis Davis. Sarah Hogg died in Colorado on September 25, 1895.[32]

Davis accompanied the family to Austin and spent several months caring for Hogg and her brothers.[33] Davis, who had lost her husband to tuberculosis and watched her son fight the disease, believed that Hogg must have contracted the disease from her mother. Davis instructed Ima to never marry so as not to pass on the illness.[34] By the end of 1895, the children had been enrolled in a boarding school in San Marcos. The following year, they returned to Austin to live with their father.[33] Although the family employed a housekeeper, Hogg was considered the lady of the house and supervised the housecleaning as well as the education of her younger brothers.[34] In 1898, Hogg accompanied her father to Hawaii, where they met Hawaiian Queen Liliuokalani and watched the ceremony that delivered Hawaii to the United States. The two were scheduled to sail to Seattle, but Hogg refused to board the ship. Sobbing, she begged her father to make other arrangements because she "had an awful feeling".[35] He relented and they instead sailed to California, where they learned that their

original ship had been lost at sea with no survivors.[35]

[edit] Education and musical interests

Music was always present at the Hogg household, and Ima began learning to play the piano at age three.[22] Although her younger brothers attended public school, Ima was enrolled at a private school and received private music lessons.[36] In 1899, she entered the University of Texas at Austin (UT),[37] where her favorite courses were German, Old English, and psychology.[38] She later remarked that "No freshman was ever more immature, more unprepared, more frightened than I." [37] She joined the female social club known as the Valentine Club, and helped to inaugurate the first sorority on the UT campus, Pi Beta Phi. After two years at the university, she moved to New York City to study piano and music theory at the National Conservatory of Music.[37]

Near the turn of the 20th century, Hogg's father began speculating in oil. He purchased 4,100 acres (17 km²) of land near West Columbia in 1901, land that had been part of the Varner plantation.[39] After two years of study in New York City, Ima Hogg returned to Texas, dividing her time between the plantation and Houston, where her father had a law practice.[40] Under her supervision, the house was later remodeled and a portico was added to what had been the back of the house; she made this the new front entrance, orienting the house away from Varner Creek.[41]

On January 26, 1905, Jim Hogg suffered an injury in a train accident. For the next year Ima nursed him as he struggled to regain his health,[42] but on March 3, 1906, she discovered her father dead in his bed.[43] Ima was devastated; to quell her grief, her brother William took her to New York City. During her stay she immersed herself in concerts and museums.[44]

In 1907, she vacationed in Germany, and enjoyed her time so much that she chose to remain in Europe to continue her piano studies.[45] For the next two years she studied music in Vienna under Franz Xaver Scharwenka, pianist to the court of Francis Joseph I of Austria, and in Berlin under Martin Krause.[46] After returning from Europe, Hogg settled in Houston with her brother William.[47][48] Although the city had a population of about 100,000, it had no museums or parks and no professional theater, music, or ballet groups.[49] Hogg chose to teach music and continued in this vocation for the next nine years. One of her first pupils was Jacques Abram, who later became a concert pianist.[47] By 1913, Hogg had become president of the Girls' Musical Society and was on the entertainment committee of the College Women's Club, which organized a small theater group known as the Green Mask Players.[48] That year, she organized the Houston Symphony Orchestra. Hogg served as the vice-president of the Symphony Society when the first session of the Board of Directors convened.[50] In 1917 the Board of Directors requested that she serve as president; she went on to serve 12 terms.[51]

[edit] Philanthropist and community leader

Hogg was affectionately known as "Miss Ima" by those who knew her,[5] and widely considered to be "The First Lady of Texas".[1] When John B. Connally was Governor of Texas, his wife Nellie declared, "The Governor's wife is usually called the First Lady of the State, but Ima always has been and always will be the First Lady of Texas." [2] In 1957, The New York Times featured prominent Texans in a series about high society, stating: "But one social figure celebrated throughout the state and even beyond its border is Miss Ima Hogg. She is now about 80 but still a civic beacon of Houston." [52]

After their father's death in 1906, Hogg and her brothers tried to sell the Varner plantation, but a provision in his will specified that the land be kept for 15 years.[53] On January 15, 1918, oil was found on the Varner plantation.[54] A second strike the following year provided oil income amounting to \$225,000 a month shared among the four siblings.[55] According to Hogg biographer Gwendolyn Cone Neely, the Hoggs did not believe that the oil money was rightfully theirs, as it had come from the land and not hard work, and they were determined to use it for the good of Texas.[41]

Hogg founded the Houston Child Guidance Center in 1929 to provide counseling for disturbed children and their families.[55] Hogg was convinced that if

children's emotional and mental problems were treated, more serious illness could be prevented in adults.[56] Her interest in mental health came from her father, who had read widely on mental health issues; during his terms as governor, Ima had often accompanied him on visits to state institutions, including charity hospitals and asylums for the mentally ill.[57] She furthered her knowledge of the field while she was a student at UT, taking several courses in psychology.[58] Ima was convinced that her youngest brother, Tom, would have benefited from similar intervention, as he had reacted badly after their mother's death and as an adult was "restless, impulsive, and alarmingly careless with money".[59] Although her ideas on mental health would be considered mainstream today, in 1929 they were pioneering.[60] In 1972, she told the Houston Chronicle that, of all her activities, she had derived most pleasure from her role in establishing the Houston Child Guidance Center.[61]

Hogg had previously suffered from mental health problems. In late 1918, she fell ill, probably from severe depression.[62] She consulted with Dr. Francis Xavier Dercum, a specialist in the treatment of nervous and mental diseases, who treated her for the next three years.[63] She was hospitalized for more than a year, and spent a further three years convalescing, primarily in Philadelphia, Pennsylvania.[47][64] By the summer of 1923 Hogg was fully recovered,[64] but she permanently discarded her dream of being a concert pianist, ostensibly because of weakness after her illness.[47]

Hogg joined her elder brother William on a vacation in Germany in 1930. During their visit, he suffered a gallbladder attack and died on September 12, 1930 after emergency surgery. Ima brought her brother's body back to the United States.[60] His will bequeathed \$2.5 million to UT; his desire was that it be used alongside money donated by his sister for "far-reaching benefit to the people of Texas".[55] Legal challenges tied up the grant until 1939, when the University received \$1.8 million. In 1940, after discussion with her brother Michaelâthe executor of the willâHogg used the money to establish the Hogg Foundation for Mental Health at the University of Texas at Austin.[55]

The San Antonio Express reported in 1939 that the funds granted to the Hogg Foundation for Mental Health would be used to establish mental hygiene clinics and conduct lectures and teacher training courses across Texas, for mental health research, and to survey mental hygiene conditions in Texas.[65] On the entry of the United States into World War II, the Foundation researched methods to prevent mentally unsuitable candidates from enlisting in the military, and provided counseling to those traumatized by the war. After the war, the Foundation expanded its educational and philanthropic focus, providing mental health care to the poor and the aged.[66] The Foundation continues to award five \$5,000 annual scholarships to individuals pursuing a Master's degree in Social Work.[67]

In 1943, Hogg decided to run for a seat on the Houston School Board so that the board would include two female members.[68] Hogg won with 4,350 votes, more than 1,000 ahead of the runner-up.[69] During her term, she worked to remove gender and race as criteria for determining pay.[70] She championed a visiting teacher program for children with emotional problems[69] and began art education programs in the schools for black students.[68] Hogg declined to run for a second term.[68]

[edit] Furniture and art collector

Hogg and her brothers were avid art collectors; she owned a large collection, including Native American art and works by Picasso, Chagall, Matisse and Modigliani.[71] Her interest in collecting began during her convalescence in Philadelphia.[64] Her first purchase, in 1922, was a Spanish foot chair or Queen Anne maple chair with carved feet.[72][73] She researched the early American furniture market extensively, personally visiting Luke Vincent Lockwood, the author of the standard work on the topic, for more information.[73] At the time, Hogg was one of a small number of people who believed that American antiques had valueâby contrast, most collectors concentrated on furniture built in Europe.[74] Other collectors soon saw the value in early American pieces. Hogg remained one of the few collectors not

located on the East Coast. As her collection grew, she was often asked to loan pieces for exhibit in New England; Hogg always refused, stating "they've got plenty of these things up there".[75]

In the 1920s, Hogg's brothers began to develop a new elite neighborhood, which they called River Oaks, on the outskirts of Houston.[76] For their home, the Hoggs chose the largest lot, 14.5 acres (5.9Â ha). Ima worked closely with architect John Staub to design a house that would show off the art the family had purchased.[77][78] William and Ima moved into the house, which she christened Bayou Bend, in 1928.[78] In 1939, when she restored her estate along American lines,[71] she donated more than 100Â works on paper to Houston's Museum of Fine Arts (MFAH), including works by CÃ@zanne, Sargent, Picasso, and Klee.[79] Following the death of her brother Michael in 1941, she donated his collection of Frederic Remington works to the museum. Consisting of 53 oil paintings, 10Â watercolors, and one bronze, it is known as the Hogg Brothers Collection, and is "one of the most important groupings of Western paintings on display in an American museum", according to Hogg biographer Neely.[68] Hogg donated her collection of Native American art to MFAH in 1944,[79] including 168 pieces of pottery, 95 pieces of jewelry, and 81Â paintings.[80]

In 1960, she was appointed by President Eisenhower to serve on a committee to plan the National Cultural Center, now called the Kennedy Center, in Washington, D.C.[81] In 1961, Jacqueline Kennedy named Hogg to the 18-member advisory committee to work with the Fine Arts Committee in seeking historical furniture for the White House.[82]

[edit] Restorations

Although Hogg spent little time at the Varner plantation after Bayou Bend was constructed, she continued to purchase art and antique furniture on its behalf.[83] In the 1950s, she restored the plantation, and each room was given a different theme from Texas history: colonial times, the Confederacy, Napoleonic times (1818), and the Mexicanâ ^American War. One room was dedicated to her father, and contained his desk and chair as well as his collection of walking sticks.[84] She donated the property to the state, and it was dedicated as the Varnerâ ^Hogg Plantation State Historical Site in 1958, the 107th anniversary of Jim Hogg's birth.[85]

As the Varnerâ ^Hogg restoration wound to a halt, Hogg refocused her attention on her Houston home, Bayou Bend,[86] which housed some of her personal collection of antiques and artwork.[70]The New York Times described her "superb Early American furniture" collection in 1953,[87] and she had a large collection of Americana and colonial Mexican decorative arts, some of which are still in the house.[88] In the late 1950s she said: "I had been collecting American furniture. I collected, and collected, and collected, until I had so much of it I didn't know what to do with it. I decided to give it to a museum." [89] She collaborated with the original architect John Staub on structural changes that would prepare the home to be a museum.[90] She denuded the home of personal items and items that did not meet her concept; the only piece of non-American furniture in the home was her English dining table, which had too many memories for her to remove it.[91]

Several residents of River Oaks sued to prevent Bayou Bend becoming a museum, but Hogg prevailed in court.[92] To alleviate the residents' concerns over increased traffic, she asked the city of Houston to build a footbridge over Buffalo Bayou so that visitors could reach the house without having to drive through River Oaks.[86] In the fall of 1965, Hogg moved out of her home,[91] telling the docents that "When you love something enough it's easy to give it up in order to see it go on." [93] The MFAH opened the new museum to the public in 1966 as MFAH's Bayou Bend Collection and Gardens.[79] At its dedication, Charles Montgomery, a Senior Research Fellow at the Henry Francis DuPont Winterthur Museum, called Bayou Bend "the largest, finest collection this side of Winterthur".[75]

In 1963, Hogg purchased property near Round Top, hoping to move its historic building to Bayou Bend. When that plan proved impractical, she decided to restore it in place and temporarily moved to Round Top.[94][95] After

personally supervising the restoration of the Winedale Inn, a stagecoach inn near Round Top, Hogg donated the property to the University of Texas at Austin. Known as the Winedale Historical Center, it is used primarily as an outdoor museum and music center,[70] and annually hosts Shakespeare at Winedale. In 1969, she restored her parents' house in Quitman; the town renamed it the Ima Hogg Museum in her honor.[96] The museum holds items from the history of Wood County and northeast Texas.[97] She later restored the home of her maternal grandfather and had it moved to the park.[98]

[edit] Description and disposition

David Warren, the first curator of Bayou Bend, said Hogg was "small and dainty and feminineâ ~and smart and sharp and knowledgeableâ ~all rolled into one".[99] Her biographer Bernhard described her as "elegantly and stylishly dressed", 5Â feet 2Â inches (157Â cm) tall and of fair complexion,[100] "independent and self-possessed"[51] and noted that she could "sugarcoat her single-mindedness with layers of charm".[101] At the age of 81, she was described by The New York Times as a "blue-eyed strawberry blonde".[71]

One morning in 1914,[51] Hogg was awakened by a burglar in her bedroom. She confronted the man, who was attempting to steal her jewelry, and not only convinced him to return the jewelry, but "wrote down a name and address, handed it to him and told him to go there that very day to get a job".[102] When asked why she did that, Hogg responded, "He didn't look like a bad man." [102] Later that year, she sailed to Germany, alone. While she was en route, Archduke Franz Ferdinand of Austria was assassinated, and the day before she arrived, Britain declared war on Germany. The United States was still neutral, however, so Hogg continued her tour of Europe, not leaving until several months later.[51]

Though Bernard describes Hogg as a woman of "unfailing politeness", [14] the biographer suggests the philanthropist was not without adversaries. For instance, at a concert arranged by the Houston Symphony for her 90th birthday featuring the elderly pianist Arthur Rubinstein,[70] he characterized her as a "tiresome old woman". Hogg, in turn, regarded the musician as "a pompous old man". By contrast, Hogg said of Vladimir Horowitz, whom she met backstage at a 1975 concert in Houston, "Such a nice man. Not at all like that Mr. Rubinstein." [103]

Hogg was a generous benefactor, and believed that "inherited money was a public trust". She was described by the University of Houston as "compassionate by nature", "progressive in outlook", "concerned with the welfare of all Texans", a "zealous proponent of mental health care" and "committed to public education".[104] Hogg was a lifelong Democrat.[14]

Hogg died on August 19, 1975, at the age of 93, from a heart attack resulting from atheroma. She had been vacationing in London at the time, but fell as she was getting into a taxi, and died a few days later in a London hospital. An autopsy report revealed that her death was not related to the earlier fall.[2][105] On receiving news of her death, the University of Texas declared two days of mourning and flew the flag at half-staff.[106]

At the time of her death, Hogg had employed her personal maid, Gertrude Vaughn, for 56Â years, and her butler-chauffeur, Lucious Broadnax, for over 40Â years.[106][107] She is buried next to her family in the Oakwood Cemetery in Austin.[106] Hogg's work lives on through the Ima Hogg Foundation, which she founded in 1964 and which was the major beneficiary of her will.[5] Hogg never married; her biographer Bernhard reports that she told a friend "she had gotten over 30 proposals of marriage but 'wouldn't have any of them'".[108]

[edit] Awards, recognition and legacy

Hogg received many awards for her contributions to the community. The Garden Club of America honored her in 1959 with the Amy Angell Colliers Montague Model for Civic Achievement.[109] In 1966, she was honored at the 20th annual awards banquet of the National Trust for Historic Preservation. She received the seventh annual Louise du Pont Crowninshield Award[110]â ~the highest award given by the National Trust for Historic Preservationâ ~for "superlative achievement in the preservation, restoration and interpretation of sites, buildings, architecture, districts, and objects of national historical or cultural

significance" in Texas.[111]

In 1968, Hogg became the first recipient of the Santa Rita Awardâ ~the highest award given by the University of Texas System[111]â ~for contributions to higher education.[112] She was presented with an honorary doctorate in fine arts from Southwestern University in 1971.[113] In 1969, she became the third woman (after Lady Bird Johnson and Oveta Culp Hobby) invited to become a member of the Academy of Texas, a society which recognized efforts to "enrich, enlarge or enlighten" knowledge in any field.[113] She also became the first female president in the 110-year history of the Philosophical Society of Texas.[111]

Her restoration work was recognized by many organizations. The National Society of Interior Designers named her to their International Honors List in 1965 and in 1972 presented her with their Thomas Jefferson Award for her contributions to cultural heritage.[113] The Texas State Historical Survey Committee recognized Hogg in 1967 for her "meritorious service in historic preservation"[92] and the American Association of State and Local History gave her an award of merit in 1969.[113]

The Houston Symphony established a scholarship in Hogg's name,[114] honored her on her 90th birthday with a special concert,[70] and holds an annual Ima Hogg Young Artist Competition for musicians between the ages of 16 and 29 who perform on orchestral instruments or the piano.[115] The Center for American History at the University of Texas at Austin presents an annual Ima Hogg Award for Historical Achievement.[116] She was a National Patroness of Delta Omicron, an international professional music fraternity.[117] The Mental Health Association of Greater Houston presents an annual Ima Hogg Award "to an individual or couple who have advanced mental health causes".[118]

In 1963, former Governor of Texas Allan Shiversâ ~when presenting Hogg with the Distinguished Alumnus Award of the University of Texas Ex-Students Association (the first woman so honored)[119]â ~said of "Miss Ima":

Some persons create history.

Some record it.

Others restore and conserve it.

She has done all three.[2]

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^ a b Bernhard (1984), p. 24.

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^ a b c Bernhard (1984), p. 25.

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^ Bernhard (1984), p. 44.

^ Neely (1992), p. 32.

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[edit] Further reading

[edit] External links

Persondata

Name

Hogg, Ima

Alternative names

The First Lady of Texas

Short description

Philanthropist, patron of the arts, one of the most respected Texas women of the 20th century

Date of birth

July 10, 1882

Place of birth

Mineola, Texas

Date of death

August 19, 1975

Place of death

London, England

Aikido

(āī æ°·é ^)

The version of the "four-direction throw" (shihÅ nage) with standing attacker and seated defender (hanmi-handachi). The receiver of the throw (uke) is taking a breakfall (ukemi) to reach the ground safely.

Focus

Grappling and softness

Country of origin

Japan

Creator

Morihei Ueshiba

Famous practitioners

Kisshomaru Ueshiba, Moriteru Ueshiba, Steven Seagal, Christian Tissier,

Morihiro Saito, Koichi Tohei, Yoshimitsu Yamada, Gozo Shioda

Parenthood

Aiki-jÅ«jutsu; Jujutsu; Kenjutsu; SÅ jutsu, Bojutsu, Iaijutsu, Jojutsu

Ancestor arts

DaitÅ -ryÅ« Aiki-jÅ«jutsu

Aikido (Japanese: āī æ°·é ^, Hepburn: AikidÅ ?) [a.i.ki.doĖĭ] is a Japanese martial art developed by Morihei Ueshiba as a synthesis of his martial studies, philosophy, and religious beliefs. Aikido is often translated as "the Way of unifying (with) life energy"[1] or as "the Way of harmonious spirit." [2] Ueshiba's goal was to create an art that practitioners could use to defend themselves while also protecting their attacker from injury.[3][4]

Aikido is performed by blending with the motion of the attacker and redirecting the force of the attack rather than opposing it head-on. This requires very little physical strength, as the aikidÅ ka (aikido practitioner) "leads" the attacker's momentum using entering and turning movements. The techniques are completed with various throws or joint locks.[5]

Aikido derives mainly from the martial art of DaitÅ -ryÅ« Aiki-jÅ«jutsu, but began to diverge from it in the late 1920s, partly due to Ueshiba's involvement with the Å moto-kyÅ religion. Ueshiba's early students' documents bear the term aiki-jÅ«jutsu.[6]

Ueshiba's senior students have different approaches to aikido, depending partly on when they studied with him. Today aikido is found all over the world in a number of styles, with broad ranges of interpretation and emphasis. However, they all share techniques learned from Ueshiba and most have concern for the well-being of the attacker.

[edit] Etymology and basic philosophy

The word "aikido" is formed of three kanji:

āī Å ā ^ aiÅ ā ^ joining, unifying, combining, fit
æ°·Å ā ^ kiÅ ā ^ spirit, energy, mood, morale

é ^Â â ^ dÂ Â â ^ way, path

The term "aiki" does not readily appear in the Japanese language outside the scope of Budo. This has led to many possible interpretations of the word. âi is mainly used in compounds to mean 'combine, unite, join together, meet', examples being âi âi (combined/united), âi æ i (composition), çuiâi (unite/combine/join together), é fâi (union/alliance/association), çuiâi (combine/unify), and âi æ (mutual agreement). There is an idea of reciprocity, ç~¥ã âi ã (to get to know one another), è@±ã 'âi ã (talk/discussion/negotiation), and â¼ã ã ;âi ã ã ,ã (meet by appointment).

æ°· is often used to express a feeling, as in æ°·ã ã ã ('I feel', as in terms of thinking but with less cognitive reasoning), æ°·æ ã ; (feeling/sensation), and æ°·â (mood/morale). It is used to mean energy or force, as in é,»æ°· (electricity) and çf æ°· (magnetism).

The term dÂ is also found in martial arts such as judo and kendo, and in the more peaceful arts such as Japanese calligraphy (shodÂ), flower arranging (kadÂ) and tea ceremony (chadÂ or sadÂ).

Therefore, from a purely linguistic point of view, aikido is 'Way of combining forces'. The term aiki refers to the martial arts principle or tactic of blending with an attacker's movements for the purpose of controlling their actions with minimal effort.[7] One applies aiki by understanding the rhythm and intent of the attacker to find the optimal position and timing to apply a counter-technique. This then is very similar to the principles expressed by KanÂ JigorÂ , founder of judo.

[edit] History

Aikido was created by Morihei Ueshiba (æø è " ç,,â¹³ Ueshiba Morihei, 14 December 1883Â â ^ 26 April 1969), referred to by some aikido practitioners as Â sensei ("Great Teacher").[8] Ueshiba envisioned aikido not only as the synthesis of his martial training, but as an expression of his personal philosophy of universal peace and reconciliation. During Ueshiba's lifetime and continuing today, aikido has evolved from the Aiki that Ueshiba studied into a wide variety of expressions by martial artists throughout the world.[5]

[edit] Initial development

Ueshiba developed aikido primarily during the late 1920s through the 1930s through the synthesis of the older martial arts that he had studied.[9] The core martial art from which aikido derives is DaitÂ -ryÂ« aiki-jÂ«jutsu, which Ueshiba studied directly with Takeda SÂ kaku, the reviver of that art. Additionally, Ueshiba is known to have studied Tenjin Shin'yÂ -ryÂ« with Tozawa TokusaburÂ in Tokyo in 1901, GotÂ ha YagyÂ« Shingan-ryÂ« under Nakai Masakatsu in Sakai from 1903 to 1908, and judo with Kiyoichi Takagi (é«"æ " â~ ä»fâ-1 Takagi Kiyoichi, 1894â ^1972) in Tanabe in 1911.[10]

The art of DaitÂ -ryÂ« is the primary technical influence on aikido. Along with empty-handed throwing and joint-locking techniques, Ueshiba incorporated training movements with weapons, such as those for the spear (yari), short staff (jÂ), and perhaps the bayonet (é â £, jÂ«ken?). However, aikido derives much of its technical structure from the art of swordsmanship (kenjutsu).[2]

Ueshiba moved to HokkaidÂ in 1912, and began studying under Takeda Sokaku in 1915. His official association with DaitÂ -ryÂ« continued until 1937.[9] However, during the latter part of that period, Ueshiba had already begun to distance himself from Takeda and the DaitÂ -ryÂ«. At that time Ueshiba was referring to his martial art as "Aiki BudÂ ". It is unclear exactly when Ueshiba began using the name "aikido", but it became the official name of the art in 1942 when the Greater Japan Martial Virtue Society (Dai Nippon Butoku Kai) was engaged in a government sponsored reorganization and centralization of Japanese martial arts.[5]

[edit] Religious influences

After Ueshiba left HokkaidÂ in 1919, he met and was profoundly influenced by Onisaburo Deguchi, the spiritual leader of the Â moto-kyÂ religion (a neo-Shinto movement) in Ayabe.[11] One of the primary features of Â moto-kyÂ is its emphasis on the attainment of utopia during one's life. This was a great influence on Ueshiba's martial arts philosophy of extending love and compassion

especially to those who seek to harm others. Aikido demonstrates this philosophy in its emphasis on mastering martial arts so that one may receive an attack and harmlessly redirect it. In an ideal resolution, not only is the receiver unharmed, but so is the attacker.[12]

In addition to the effect on his spiritual growth, the connection with Deguchi gave Ueshiba entry to elite political and military circles as a martial artist. As a result of this exposure, he was able to attract not only financial backing but also gifted students. Several of these students would found their own styles of aikido.[13]

[edit] International dissemination

Aikido was first brought to the rest of the world in 1951 by Minoru Mochizuki with a visit to France where he introduced aikido techniques to judo students.[14] He was followed by Tadashi Abe in 1952 who came as the official Aikikai Hombu representative, remaining in France for seven years. Kenji Tomiki toured with a delegation of various martial arts through 15 continental states of the United States in 1953.[13] Later in that year, Koichi Tohei was sent by Aikikai Hombu to Hawaii, for a full year, where he set up several dojo. This was followed up by several further visits and is considered the formal introduction of aikido to the United States. The United Kingdom followed in 1955; Italy in 1964; and Germany 1965. Designated "Official Delegate for Europe and Africa" by Morihei Ueshiba, Masamichi Noro arrived in France in September 1961. Seiichi Sugano was appointed to introduce aikido to Australia in 1965. Today there are aikido dojo available throughout the world. Aikido was exhibited in Hollywood films by Steven Seagal in the 1990s.

[edit] Proliferation of independent organizations

The largest aikido organization is the Aikikai Foundation which remains under the control of the Ueshiba family. However, aikido has many styles, mostly formed by Morihei Ueshiba's major students.[13]

The earliest independent styles to emerge were Yoseikan Aikido, begun by Minoru Mochizuki in 1931,[14] Yoshinkan Aikido founded by Gozo Shioda in 1955,[15] and Shodokan Aikido, founded by Kenji Tomiki in 1967.[16] The emergence of these styles pre-dated Ueshiba's death and did not cause any major upheavals when they were formalized. Shodokan Aikido, however, was controversial, since it introduced a unique rule-based competition that some felt was contrary to the spirit of aikido.[13]

After Ueshiba's death in 1969, two more major styles emerged. Significant controversy arose with the departure of the Aikikai Hombu Dojo's chief instructor Koichi Tohei, in 1974. Tohei left as a result of a disagreement with the son of the founder, Kisshomaru Ueshiba, who at that time headed the Aikikai Foundation. The disagreement was over the proper role of ki development in regular aikido training. After Tohei left, he formed his own style, called Shin Shin Toitsu Aikido, and the organization which governs it, the Ki Society (Ki no Kenkyōkai).[17]

A final major style evolved from Ueshiba's retirement in Iwama, Ibaraki, and the teaching methodology of long term student Morihiro Saito. It is unofficially referred to as the "Iwama style", and at one point a number of its followers formed a loose network of schools they called Iwama Ryu. Although Iwama style practitioners remained part of the Aikikai until Saito's death in 2002, followers of Saito subsequently split into two groups; one remaining with the Aikikai and the other forming the independent Shinshin Aikishuren Kai in 2004 around Saito's son Hitohiro Saito.

Today, the major styles of aikido are each run by a separate governing organization, have their own headquarters (æ -é "é ^â ´, honbu dÅ jÅ ?) in Japan, and have an international breadth.[13]

[edit] Training

In aikido, as in virtually all Japanese martial arts, there are both physical and mental aspects of training. The physical training in aikido is diverse, covering both general physical fitness and conditioning, as well as specific techniques.[18] Because a substantial portion of any aikido curriculum consists of throws, the first thing most students learn is how to safely fall or

roll.[18] The specific techniques for attack include both strikes and grabs; the techniques for defense consist of throws and pins. After basic techniques are learned, students study freestyle defense against multiple opponents, and techniques with weapons.

[edit] Fitness

Physical training goals pursued in conjunction with aikido include controlled relaxation, flexibility, and endurance, with less emphasis on strength training. In aikido, pushing or extending movements are much more common than pulling or contracting movements. This distinction can be applied to general fitness goals for the aikido practitioner.[2]

In aikido, specific muscles or muscle groups are not isolated and worked to improve tone, mass, and power. Aikido-related training emphasizes the use of coordinated whole-body movement and balance similar to yoga or pilates. For example, many dojos begin each class with warm-up exercises (æ°~å ä½æ^ , junbi taisÅ ?), which may include stretching and ukemi (break falls).[19]

[edit] Roles of uke and nage

Aikido training is based primarily on two partners practicing pre-arranged forms (kata) rather than freestyle practice. The basic pattern is for the receiver of the technique (uke) to initiate an attack against the person who applies the techniqueâ ~the å ~ã tori, or shite ä»~æ (depending on aikido style), also referred to as æ ~ã ´ nage (when applying a throwing technique), who neutralises this attack with an aikido technique.[20]

Both halves of the technique, that of uke and that of nage, are considered essential to aikido training.[20] Both are studying aikido principles of blending and adaptation. Nage learns to blend with and control attacking energy, while uke learns to become calm and flexible in the disadvantageous, off-balance positions in which nage places them. This "receiving" of the technique is called ukemi.[20]Uke continuously seeks to regain balance and cover vulnerabilities (e.g., an exposed side), while nage uses position and timing to keep uke off-balance and vulnerable. In more advanced training, uke will sometimes apply reversal techniques (è¿~ã ´æ , kaeshi-waza?) to regain balance and pin or throw nage.

Ukemi (å ´è°«?) refers to the act of receiving a technique. Good ukemi involves attention to the technique, the partner and the immediate environmentâ ~it is an active rather than a passive receiving of aikido. The fall itself is part of aikido, and is a way for the practitioner to receive, safely, what would otherwise be a devastating strike or throw.

[edit] Initial attacks

Aikido techniques are usually a defense against an attack, so students must learn to deliver various types of attacks to be able to practice aikido with a partner. Although attacks are not studied as thoroughly as in striking-based arts, "honest" attacks (a strong strike or an immobilizing grab) are needed to study correct and effective application of technique.[2]

Many of the strikes (æ ~ã ;, uchi?) of aikido resemble cuts from a sword or other grasped object, which indicates its origins in techniques intended for armed combat.[2] Other techniques, which explicitly appear to be punches (tsuki), are practiced as thrusts with a knife or sword. Kicks are generally reserved for upper-level variations; reasons cited include that falls from kicks are especially dangerous, and that kicks (high kicks in particular) were uncommon during the types of combat prevalent in feudal Japan. Some basic strikes include:

Front-of-the-head strike (æ-fé"çæ ~ã ;, shÅ men'uchi?) a vertical knifehand strike to the head. In training, this is usually directed at the forehead or the crown for safety, but more dangerous versions of this attack target the bridge of the nose and the maxillary sinus.

Side-of-the-head strike (æ"~æ"çæ ~ã ;, yokomen'uchi?) a diagonal knifehand strike to the side of the head or neck.

Chest thrust (è ,çª ~ã , mune-tsuki?) a punch to the torso. Specific targets include the chest, abdomen, and solar plexus. Same as "middle-level thrust" (ä,-æ@µçª ~ã , chÅ«dan-tsuki?), and "direct thrust" (ç,´çª ~ã , choku-tsuki?).

Face thrust (éí~é"ççª ã , ganmen-tsuki?) a punch to the face. Same as "upper-level thrust" (ä, æµçª ã , jÅ dan-tsuki?).

Beginners in particular often practice techniques from grabs, both because they are safer and because it is easier to feel the energy and lines of force of a hold than a strike. Some grabs are historically derived from being held while trying to draw a weapon; a technique could then be used to free oneself and immobilize or strike the attacker who is grabbing the defender.[2] The following are examples of some basic grabs:

Single-hand grab (ç æ å ~ã , katate-dori?) one hand grabs one wrist.
Both-hands grab (è«æ å ~ã , morote-dori?) both hands grab one wrist. Same as "single hand double-handed grab" (ç æ ä,æ å ~ã , katateryÅ te-dori?)
Both-hands grab (ä,æ å ~ã , ryÅ te-dori?) both hands grab both wrists. Same as "double single-handed grab" (ä,ç æ å ~ã , ryÅ katate-dori?).
Shoulder grab (è @å ~ã , kata-dori?) a shoulder grab. "Both-shoulders-grab" is ryÅ kata-dori (ä,è @å ~ã ?). It is sometimes combined with an overhead strike as Shoulder grab face strike (è @å ~ã é"çæ ^ã ;, kata-dori men-uchi?).
Chest grab (è ,å ~ã , mune-dori or muna-dori?) grabbing the (clothing of the) chest. Same as "collar grab" (è¥~å ~ã , eri-dori?).

[edit] Basic techniques

The following are a sample of the basic or widely practiced throws and pins. Many of these techniques derive from DaitÅ -ryÅ« Aiki-jÅ«jutsu, but some others were invented by Morihei Ueshiba. The precise terminology for some may vary between organisations and styles, so what follows are the terms used by the Aikikai Foundation. Note that despite the names of the first five techniques listed, they are not universally taught in numeric order.[21]

First technique (ä, æ- , ikkyÅ ?) a control using one hand on the elbow and one hand near the wrist which leverages uke to the ground.[22] This grip applies pressure into the ulnar nerve at the wrist.

Second technique (ä° æ- , nikyÅ ?) a pronating wristlock that torques the arm and applies painful nerve pressure. (There is an adductive wristlock or Z-lock in ura version.)

Third technique (ä, æ- , sankyÅ ?) a rotational wristlock that directs upward-spiraling tension throughout the arm, elbow and shoulder.

Fourth technique (ä,æ- , yonkyÅ ?) a shoulder control similar to ikkyÅ , but with both hands gripping the forearm. The knuckles (from the palm side) are applied to the recipient's radial nerve against the periosteum of the forearm bone.[23]

Fifth technique (ä°~æ- , gokyÅ ?) visually similar to ikkyÅ , but with an inverted grip of the wrist, medial rotation of the arm and shoulder, and downward pressure on the elbow. Common in knife and other weapon take-aways.

Four-direction throw (ä,æ~¹æ -ã ´, shihÅ nage?) The hand is folded back past the shoulder, locking the shoulder joint.

Forearm return (ä° æ èç~ã ´, kotegaeshi?) a supinating wristlock-throw that stretches the extensor digitorum.

Breath throw (ä`¼å¹æ -ã ´, kokyÅ«nage?) a loosely used term for various types of mechanically unrelated techniques, although they generally do not use joint locks like other techniques.[24]

Entering throw (å ¥è°«æ -ã ´, iriminage?) throws in which nage moves through the space occupied by uke. The classic form superficially resembles a "clothesline" technique.

Heaven-and-earth throw (åµ@å °æ -ã ´, tenchinage?) beginning with ryÅ te-dori; moving forward, nage sweeps one hand low ("earth") and the other high ("heaven"), which unbalances uke so that he or she easily topples over.

Hip throw (è °æ -ã ´, koshinage?) aikido's version of the hip throw. Nage drops his or her hips lower than those of uke, then flips uke over the resultant fulcrum.

Figure-ten throw (å å-¹æ -ã ´, jÅ«jinage?) or figure-ten entanglement (å å-¹çµ;ã ç, jÅ«jigarami?) a throw that locks the arms against each other (The kanji for "10" is a cross-shape: å).[25]

Rotary throw (ä,è«çæ -ã ´, kaitennage?) nage sweeps the arm back until it locks the shoulder joint, then uses forward pressure to throw.[26]

[edit] Implementations

Aikido makes use of body movement (tai sabaki) to blend with uke. For example, an "entering" (irimi) technique consists of movements inward towards uke, while a "turning" (tenkan?) technique uses a pivoting motion.[27] Additionally, an "inside" (uchi?) technique takes place in front of uke, whereas an "outside" (soto?) technique takes place to his side; a "front" (omote?) technique is applied with motion to the front of uke, and a "rear" (ura?) version is applied with motion towards the rear of uke, usually by incorporating a turning or pivoting motion. Finally, most techniques can be performed while in a seated posture (seiza). Techniques where both uke and nage are standing are called tachi-waza, techniques where both start off in seiza are called suwari-waza, and techniques performed with uke standing and nage sitting are called hanmi handachi.[28]

Thus, from fewer than twenty basic techniques, there are thousands of possible implementations. For instance, ikkyÅ can be applied to an opponent moving forward with a strike (perhaps with an ura type of movement to redirect the incoming force), or to an opponent who has already struck and is now moving back to reestablish distance (perhaps an omote-waza version). Specific aikido kata are typically referred to with the formula "attack-technique(-modifier)".[29] For instance, katate-dori ikkyÅ refers to any ikkyÅ technique executed when uke is holding one wrist. This could be further specified as katate-dori ikkyÅ omote, referring to any forward-moving ikkyÅ technique from that grab.

Atemi (atemi) are strikes (or feints) employed during an aikido technique. Some view atemi as attacks against "vital points" meant to cause damage in and of themselves. For instance, GÅ zÅ Shioda described using atemi in a brawl to quickly down a gang's leader.[30] Others consider atemi, especially to the face, to be methods of distraction meant to enable other techniques. A strike, whether or not it is blocked, can startle the target and break his or her concentration. The target may become unbalanced in attempting to avoid the blow, for example by jerking the head back, which may allow for an easier throw.[28] Many sayings about atemi are attributed to Morihei Ueshiba, who considered them an essential element of technique.[31]

[edit] Weapons

Weapons training in aikido traditionally includes the short staff (jÅ), wooden sword (bokken), and knife (tantÅ).[32] Today, some schools incorporate firearm-disarming techniques. Both weapon-taking and weapon-retention are sometimes taught, to integrate armed and unarmed aspects. Others, such as the Iwama style of Morihiro Saito, usually spend substantial time with bokken and jÅ , practised under the names aiki-ken, and aiki-jÅ , respectively.

The founder developed much of empty handed aikido from traditional sword and spear movements. Consequently, the practice of these movements both gives insight into the origin of techniques and movements, and reinforces the concepts of distance, foot movement, presence and connectedness with one's training partner(s).[33]

[edit] Multiple attackers and randori

One feature of aikido is training to defend against multiple attackers, often called taninzudori, or taninzugake. Freestyle (randori, or jiyÅ waza) practice with multiple attackers is a key part of most curricula and is required for the higher level ranks.[34] "Randori", literally "chaos", exercises a person's ability to intuitively perform techniques in an unstructured environment.[34] Strategic choice of techniques, based on how they reposition the student relative to other attackers, is important in randori training. For instance, an ura technique might be used to neutralise the current attacker while turning to face attackers approaching from behind.[2]

In Shodokan Aikido, randori differs in that it is not performed with multiple persons with defined roles of defender and attacker, but between two people, where both participants attack, defend, and counter at will. In this respect it resembles judo randori.[16]

[edit] Injuries

In applying a technique during training, it is the responsibility of nage to prevent injury to uke by employing a speed and force of application that is commensurate with their partner's proficiency in ukemi.[20] Injuries (especially those to the joints), when they do occur in aikido, are often the result of nage misjudging the ability of uke to receive the throw or pin.[35][36]

A study of injuries in the martial arts showed that while the type of injuries varied considerably from one art to the other, the differences in overall rates of injury were much less pronounced. Soft tissue injuries are one of the most common types of injuries found within aikido, and a few deaths from repetitive "shihÅ nage" in a Japanese-style hazing context have been reported.[35][36][37] [edit] Mental training

Aikido training is mental as well as physical, emphasizing the ability to relax the mind and body even under the stress of dangerous situations.[38] This is necessary to enable the practitioner to perform the bold enter-and-blend movements that underlie aikido techniques, wherein an attack is met with confidence and directness.[39] Morihei Ueshiba once remarked that one "must be willing to receive 99% of an opponent's attack and stare death in the face" in order to execute techniques without hesitation.[40] As a martial art concerned not only with fighting proficiency but with the betterment of daily life, this mental aspect is of key importance to aikido practitioners.[41]

[edit] Criticisms

The most common criticism of aikido is that it suffers from a lack of realism in training. The attacks initiated by uke (and which nage must defend against) have been criticized as being "weak," "sloppy," and "little more than caricatures of an attack." [42][43] Weak attacks from uke cause a conditioned response from nage, and result in underdevelopment of the strength and conditioning needed for the safe and effective practice of both partners.[42] To counteract this, some styles allow students to become less compliant over time but, in keeping with the core philosophies, this is after having demonstrated proficiency in being able to protect themselves and their training partners. Shodokan Aikido addresses the issue by practising in a competitive format.[16] Such adaptations are debated between styles, with some maintaining that there is no need to adjust their methods because either the criticisms are unjustified, or that they are not training for self-defence or combat effectiveness, but spiritual, fitness or other reasons.[44]

Another criticism is that after the end of Ueshiba's seclusion in Iwama from 1942 to the mid-1950s, he increasingly emphasized the spiritual and philosophical aspects of aikido. As a result, strikes to vital points by nage, entering (irimi) and initiation of techniques by nage, the distinction between omote (front side) and ura (back side) techniques, and the use of weapons, were all de-emphasized or eliminated from practice. Lack of training in these areas is thought to lead to an overall loss of effectiveness by some aikido practitioners.[45]

Conversely, there are some who criticize aikido practitioners for not placing enough importance on the spiritual practices emphasized by Ueshiba. The premise of this criticism is that "O-Sensei's aikido was not a continuation and extension of the old and has a distinct discontinuity with past martial and philosophical concepts." [46] That is, that aikido practitioners who focus on aikido's roots in traditional jujutsu or kenjutsu are diverging from what Ueshiba taught. Such critics urge practitioners to embrace the assertion that "[Ueshiba's] transcendence to the spiritual and universal reality was the fundamentals [sic] of the paradigm that he demonstrated." [46]

The study of ki is a critical component of aikido, and its study defies categorization as either "physical" or "mental" training, as it encompasses both. The original kanji for ki was æ°¸, and is a symbolic representation of a lid covering a pot full of rice; the "nourishing vapors" contained within are ki.[47]

The character for ki is used in everyday Japanese terms, such as "health" (å æ°¸, genki?), or "shyness" (å æ°¸, uchiki?). Ki is most often understood as

unified physical and mental intention, however in traditional martial arts it is often discussed as "life energy". GÅ zÅ Shioda's Yoshinkan Aikido, considered one of the "hard styles," largely follows Ueshiba's teachings from before World War II, and surmises that the secret to ki lies in timing and the application of the whole body's strength to a single point.[30] In later years, Ueshiba's application of ki in aikido took on a softer, more gentle feel. This was his Takemusu Aiki and many of his later students teach about ki from this perspective. Koichi Tohei's Ki Society centers almost exclusively around the study of the empirical (albeit subjective) experience of ki with students ranked separately in aikido techniques and ki development.[48]

[edit] Uniforms and ranking

Aikido practitioners (commonly called aikidÅ ka outside of Japan) generally progress by promotion through a series of "grades" (kyÅ«), followed by a series of "degrees" (dan), pursuant to formal testing procedures. Some aikido organizations use belts to distinguish practitioners' grades, often simply white and black belts to distinguish lower and higher grades, though some use various belt colors. Testing requirements vary, so a particular rank in one organization is not comparable or interchangeable with the rank of another.[2] Some dojos do not allow students to take the test to obtain a dan rank unless they are 16 or older.

The uniform worn for practicing aikido (aikidÅ gi) is similar to the training uniform (keikogi) used in most other modern martial arts; simple trousers and a wraparound jacket, usually white. Both thick ("judo-style"), and thin ("karate-style") cotton tops are used.[2] Aikido-specific tops are available with shorter sleeves which reach to just below the elbow.

Most aikido systems add a pair of wide pleated black or indigo trousers called a hakama. In many styles, its use is reserved for practitioners with (dan) ranks or for instructors, while others allow all practitioners or female practitioners to wear a hakama regardless of rank.[2]

[edit] See also

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[edit] External links

Encyclopedia of Aikido

AikiWeb Aikido Information - a site on aikido, with essays, forums, gallery, reviews, columns, wiki and other information.

AikidoFAQ - an informational aikido website, including articles, tips, and multimedia.

Aikido Journal - Online magazine. Provides articles, interviews, and discussion of techniques.

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Indian subcontinent

Bangladesh: Boli Khela, Lathi Khela

North India: Gatka (Sikh) - Inbuan (Mizoram) - Lathi (stick fighting)

Malla-yuddha - Musti yuddha - Mukna (Manipur) - Pehlwani (Persian wrestling) - Thang-Ta (Manipur)

South India: Kalaripayattu - Kuttu varisai - Marma Ati - Silambam

Pakistan: Malakhra

Sri Lanka: Angampora

Middle East and Central Asia

Greater Iran

Varzesh-e Pahlavani, Pehlwani

Folk wrestling: Armenian, Azeri, Mongolian, Turkish, Tatar, Uzbek

European

Historical fencing: German - French school of fencing - Italian - Spanish

stick fighting: Bataireacht - Bâton français - Juego del Palo - Jogo do Pau - quarterstaff - singlestick

striking: Pankration - Greek boxing, Russian fist fighting

folk wrestling: Breton - English: Cumbrian, Devon, Lancashire - Greek - Icelandic - Scottish - Serbian - Swiss

Other

Africa: Dambe, Istunka, Canarian wrestling, Senegalese wrestling
Oceania: Mau rĀ kau

Roman Vishniac (pron.: /Ė vĖ^aĖ ni.Ā|k/; Russian: Ð Ð³Ð¹Ð°Ð¹ Ð´Ð.Ñ Ð¹Ñ Ð°; August 19, 1897 â January 22, 1990) was a Russian-American photographer, best known for capturing on film the culture of Jews in Central and Eastern Europe before the Holocaust. A complete archive of his work now rests at the International Center of Photography.[1][2]

Vishniac was a versatile photographer, an accomplished biologist, an art collector and teacher of art history. He also made significant scientific contributions to photomicroscopy and time-lapse photography. Vishniac was very interested in history, especially that of his ancestors, and strongly attached to his Jewish roots; he was a Zionist later in life.[3]

Roman Vishniac won international acclaim for his photos of shtetlach and Jewish ghettos, celebrity portraits, and microscopic biology. His book *A Vanished World*, published in 1983, made him famous and is one of the most detailed pictorial documentations of Jewish culture in Eastern Europe in the 1930s.[2] Vishniac was also remembered for his humanism and respect for life, sentiments that can be seen in all aspects of his work.

[edit] Biography

[edit] Early life

Vishniac was born in his grandparents' dacha outside Saint Petersburg, in the town of Pavlovsk, and grew up in Moscow.[4] To live in this city was a right granted to few Jews but the Vishniac family lived there because Solomon Vishniac, Roman's father, was a wealthy manufacturer of umbrellas, and his mother, Manya, was the daughter of affluent diamond dealers. Vishniac also had a sister, Katja.[5] During the summer months, the Vishniac family left Moscow, as it became uncomfortably hot, and they retreated to a dacha a few miles outside the city.

As a child, Vishniac was fascinated by biology and photography, and his room was filled with "plants, insects, fish and small animals".[6] On his seventh birthday, he got a microscope from his grandmother, to which he promptly hooked up a camera, and by which he photographed the muscles in a cockroach's leg at 150 times magnification. Young Vishniac used this microscope extensively, viewing and photographing everything he could find, from dead insects to animal scales, to pollen and protozoa.[3]

Until the age of ten, Vishniac was homeschooled; from ten to seventeen, he attended a private school at which he earned a gold medal for scholarship.[7] Beginning in 1914, he spent six years at Shanyavsky Institute (now University) in Moscow. While enrolled there, he served in the Tsarist, Kerensky and Soviet armies. At the Institute, he studied zoology and became an assistant professor of biology.[6] As a graduate student, he worked with prestigious biologist Nikolai Koltzoff, experimenting with inducing metamorphosis in axolotl, a species of aquatic salamander. While his experiments were a success, Vishniac was not able to publish a paper detailing his findings due to the chaos in Russia and his results were eventually independently duplicated. In spite of this, he went on to take a three-year course in medicine.[3]

[edit] Berlin

In 1918, Vishniac's immediate family moved to Berlin because of anti-Semitism spurred by uprisings against the Bolsheviks. Roman followed them and, shortly after arriving, married Luta (Leah) Bagg, who gave birth to two children, Mara and Wolf.[8] Roman Vishniac supported his own budding family (and sometimes his parents as well) by working at various jobs. In his free time, he studied Far Eastern Art at the University of Berlin. Vishniac researched endocrinology and optics, and did some photography (see right). In Berlin, he also initiated his public speaking career by joining the Salamander Club, at which he often gave lectures on naturalism.[3]

In 1935, as anti-Semitism was growing in Germany, Vishniac was commissioned by the American Jewish Joint Distribution Committee(JDC) in Central Europe to photograph Jewish communities in Eastern Europe as part of a fund-raising drive

to help support these poor communities.[9] Vishniac developed and printed these pictures in his dark room in his Berlin apartment. Further trips to Eastern Europe were undertaken between 1935 and 1938, again at the behest of the JDC.[2] Vishniac used both a Leica and a Rolleiflex camera in his photography. In 1939, his wife and children moved to Sweden to stay with Luta's parents, away from hostile Germany. He met his parents in Nice that summer.[3]

Vishniac returned to Paris in late summer 1940, and was arrested by Marshal Pétain's police and interned at Camp du Ruchard, a deportation camp in Indre-et-Loire. This occurred because Latvia, of which he was a citizen, had been subsumed into the Soviet Union and Vishniac was considered a "stateless person". After three months, as a result of his wife's efforts and aid from the American Jewish Joint Distribution Committee, he obtained a visa that allowed him to escape via Lisbon to the U.S. with his family. His father stayed behind and spent the war hidden in France; his mother died from cancer in 1941 while still in Nice.[3][5][10]

[edit] New York

The Vishniac family fled from Lisbon to New York City in 1940,[4] arriving on New Year's Eve. Vishniac tried to get a job but failed: "For me, it was a time of distraction and fear." [3] He was multilingual, speaking at least German, Russian and Yiddish, but he could not yet speak any English and thus had a difficult time.[11] He managed to do some portraiture work with mostly foreign clients; but business was poor. It was during this time, in 1942, that he took one of his most celebrated portraits, that of Albert Einstein. He arrived at Einstein's home in Princeton, New Jersey, getting into the scientist's study with the ruse of bringing regards from mutual friends in Europe, and photographed him while the scientist was not paying attention to him, occupied in thought. Einstein later called this portrait his favourite.

In 1946, Vishniac divorced Luta, and the next year he married Edith Ernst, an old family friend. A few years later, he gave up portraiture and went on to do freelance work in the field of photomicroscopy.[3]

Once in the United States, Vishniac tried desperately to earn sympathy for impoverished Jews in Eastern Europe. When his work was exhibited at Teachers College, Columbia University in 1943,[12] he wrote to Eleanor Roosevelt (First Lady at the time), asking her to visit the exhibit, but she did not. He also sent some of his photographs to the President, for which he was politely thanked.[13][14]

Of the 16,000 taken in Eastern Europe by Vishniac, only 2,000 photographs reached America.[14][15] Most of these negatives were carefully hidden by Vishniac and his family; others were smuggled in by Vishniac's good friend Walter Bierer through Cuba.[13] In the photographer's own words,

â

I sewed some of the negatives into my clothing when I came to the United States in 1940. Most of them were left with my father in Clermont-Ferrand, a small city in central France. He survived there, hidden. He concealed the negatives under floorboards and behind picture frames.[15]

â "

[edit] Later life

Even when he grew older, Vishniac was very active. In 1957, he was appointed research associate at the Albert Einstein College of Medicine and in 1961 was promoted to "professor of biological education".[16] In his seventies and eighties, Vishniac became "Chevron Professor of Creativity" at Pratt Institute (where he taught courses on topics such as the philosophy of photography[11]). During this time he lived on the West Side of Manhattan with his wife Edith, teaching, photographing, reading and collecting artifacts.[17] Some items that were in his collection include a 14th-century Buddha, Chinese tapestries, Japanese swords, various antique microscopes, valued old maps and venerable books.[18] He taught Oriental and Russian art, general philosophy and religion in science, specifically Jewish topics, ecology, numismatics, photography and general science at City University of New York, Case Western Reserve University[16] and at various other institutions.[3]

During his life, Vishniac was the subject and creator of many films and documentaries; the most celebrated of which was the Living Biology series. This consisted of seven films on cell biology; organs and systems; embryology; evolution; genetics; ecology; botany; the animal world; and the microbial world. It was funded by a grant from the National Science Foundation.[7]

Vishniac received Honorary Doctoral degrees from the Rhode Island School of Design, Columbia College of Art and the California College of Art,[19] before his death from colon cancer on January 22, 1990.[20]

[edit] Photography

[edit] In Central and Eastern Europe

[edit] 1935â ~1939

Vishniac is best known for his dramatic photographs of poor and pious Jews in cities and shtetlach of Eastern Europe.[2] He was commissioned to take these pictures by the American Jewish Joint Distribution Committee (JDC) as part of a fundraising initiative, but Vishniac had a personal interest in this subject matter. He traveled back and forth from Berlin to the ghettos of Russia, Poland, Romania, Czechoslovakia and Lithuania between 1935 and 1938 as well as working for the Committee.[4][21]

While touring Europe, Vishniac posed as a traveling fabric salesman, seeking aid where he could and bribing anyone who got in his way.[22] During his touring of Eastern Europe (1935â ~1939), he was often arrested by police for taking these pictures, sometimes because he was thought to be spying[15] Later, when published, these photographs made him popular enough for his work to be showcased as one-man shows at Columbia University, the Jewish Museum (New York), International Center of Photography and other such institutions.

Vishniac claimed that he had taken 16,000 photos in this period, every one a candid shot,[11] but the veracity of these claims has been challenged by research by Maya Benton, a curator at the International Center of Photography.[2][23] In order to photograph small villages in these mountains, Vishniac claimed he carried heavy equipment (Leica, Rolleiflex, movie camera, tripods), 115Â pounds (52 kilograms) by his estimate, on his back, up steep roads, trekking many miles.[13][17][3] Vishniac captured thousands of impoverished Jews on film, "[...] to preserve â ~ in pictures, at least â ~ a world that might soon cease to exist".[24]

When using a Leica for indoor shots, Vishniac sometimes brought a kerosene lamp (visible in some of his work) if there was insufficient light, keeping his back to a wall for support, and holding his breath.[11] The Rolleiflex was used mostly for outdoor scenes.

Roman Vishniac did not just want to preserve the memories of the Jews; he actively fought to increase awareness in the West of the worsening situation in Eastern Europe. "Through his photographs, he sought to alert the rest of the world to the horrors [of the Nazi persecution]", Mitgang.[17] In late 1938, for example, he sneaked into Zbaszyn, an internment camp in Germany near the border, where Jews awaited deportment to Poland. After photographing the "filthy barracks", as he described it, for two days,[25] he escaped by jumping from the second floor at night and creeping away, avoiding broken glass and barbed wire. These photos were sent to the League of Nations in Geneva to prove the existence such camps.[17]

After Vishniac's death, many photos came to light depicting life in Berlin taken between 1920 and 1939. Some of these negatives were found at the end of rolls of film devoted to scientific work. An exhibition of Vishniac's Berlin photos was mounted at the Jewish Museum, Berlin in 2005,[26] and a book of the photos was published.

Vishniac's photographs from the 1930s are all of a very distinct style; they are all focused on achieving the same end: capturing the unique culture of Jewish ghettos in Eastern Europe, especially the religious and impoverished.[2] His published pictures largely center on these people, usually in small groups, going about their daily lives: very often studying (generally religious texts), walking (many times through harsh weather), and sometimes just sitting; staring. The scenes are dramatic: "There is barely a hint of a smile on any of

the faces. The eyes peer at us suspiciously from behind ancient casement windows and over a peddler's tray, from crowded schoolrooms and desolate street corners." [27] Gene Thornton, writer for The New York Times, called them "[...] somber with poverty and with the gray light of European Winter". [28]

These pictures, all in black and white, were done with available light or sometimes a lantern, [11] yet they are "amazingly crisp with surprising depth of field". [29] Indeed, "There is a grainy realism to Vishniac's photographic style. We can almost finger the coarse textures of coats and shawls; the layers of fabric worn by the people seem more related to tree bark than to the well-pressed wool suit worn by an occasional elegant passerby." [27] Vishniac is known to have exaggerated in composing the captions of his photographs, and in some cases he may have fabricated the stories behind them. [2]

[edit] Impact

Vishniac's photographs from this period are widely commended and on permanent display in many museums. Edward Steichen places his pre-Holocaust photographs, "among photography's finest documents of a time and place." [22] However, there has been criticism of Vishniac's work, focusing on the lack of diversity of his subjects in his work from Eastern Europe and quality of his composition. It has been argued that he should have also photographed wealthier Jews, in addition to the poor Jews in ghettos. Thornton criticized his photographs for their unprofessional qualities, citing "errors of focus and accidents of design, as when an unexplained third leg and foot protrudes from the long coat of a hurrying scholar." [28]

Vishniac's photographs have had a profound effect on Holocaust literature and have illustrated many books about the Jewish ghettos and Holocaust. In the case of *The Only Flowers of her Youth*, the drama of the photograph inspired Miriam Nerlove to write a novel based on the story of the girl in the picture. [30]

For this work, Roman Vishniac has received the Memorial Award of the American Society of Magazine Photographers in 1956. He was also the winner of the visual arts category of awards of the Jewish Book Council in 1984; *The Only Flowers of her Youth* was deemed "most impressive" at the International Photographic Exhibition in Lucerne in 1952; and the Grand Prize for Art in Photography, New York Coliseum. [3] [6]

When photographic curator Maya Benton began to catalog Vishniac's negatives for the archive of the International Center of Photography, she noticed that, in his book *A Vanished World*, Vishniac juxtaposed photos to tell stories, and wrote captions that were not supported by the material. In the final spread of the book, there is a photo of a man peering through a metal door; on the opposite page a small boy points with his finger to his eye. Vishniac's caption reads: "The father is hiding from the Endecy (members of the National Democratic Party). His son signals him that they are approaching. Warsaw, 1938." At the front of the book, additional commentary reads: "The pogromshchiki" (pogrom lynch mob) "are coming. But the iron door was no protection." Benton's research found that the photos were from different rolls of film, taken in different towns, so the scene described in the book "almost certainly did not happen". [2] In addition, Michael di Capua, who edited Vishniac's text for *A Vanished World*, has said that he felt disquiet while compiling the text, since so much information was unsubstantiated. [2] Benton also suggested that the terms of Vishniac's commission from the JDC "to photograph 'not the fullness of Eastern European Jewish life but its most needy, vulnerable corners for a fund-raising project'" "had led to his over-emphasizing poor, religious communities in *A Vanished World*." [2]

[edit] Photomicroscopy and biology

In addition to the candid photography for which he is best known, Vishniac worked heavily in the field of photomicroscopy, (specifically interference microscopy and cinemicroscopy). He specialized in photographing living insects and had a talent for arranging the moving specimens in "just the right poses", according to Philippe Halsman, former president of the American Society of Magazine Photographers. On the subject of Vishniac's skill in photomicroscopy, Halsman said he was, "a special kind of genius". [3] He worked with all sorts of

specimens, from protozoa, to fireflies to amino acids. Vishniac's work in photomicroscopy was, and is, highly regarded in the field. For three consecutive years, beginning in 1952, he won the Best-of-the-Show Award of the Biological Photographic Association in New York.[3]

One of Roman Vishniac's most famous endeavors in the field of photomicroscopy was his revolutionary photographs from the inside of a firefly's eye, behind 4,600 tiny ommatidia, complexly arranged. In addition, there were the images taken at the medical school of Boston University of the circulating blood inside a hamster's cheek pouch. Vishniac invented new methods for light-interruption photography and color photomicroscopy.[16] His method of colorization, (developed in the 1960s and early 1970s) uses polarized light to penetrate certain formations of cell structure and may greatly improve the detail of an image.[3]

In the field of biology, Vishniac specialized in marine microbiology, the physiology of ciliates, circulatory systems in unicellular plants and endocrinology (from his work in Berlin) and metamorphosis.[16] Despite his aptitude and accomplishments in the field, most of his work in biology was secondary to his photography: Vishniac studied the anatomy of an organism primarily to better photograph it. Besides experimenting with the metamorphosis of axolotl, he also researched the morphology of chromosomes in 1920: both in Berlin. As a biologist and philosopher in 1950, he hypothesized polyphyletic origin, a theory that life arose from multiple, independent biochemical reactions, spawning multicellular life. As a philosopher, he "developed principles of rationalistic philosophy" in the '50s.[3]

[edit] Other photography

Vishniac is notable for his photographs of insects mating, sea bass feasting and other living creatures in full animation. Skillfully and patiently, he would stalk insects or other such creatures for hours in the suburbs around New York City. Before beginning the hunt, he would lie for over an hour in the grass, rubbing himself with proximate flora to make himself smell less artificial. He would then gracefully swoop close to his prey and patiently frame the scene with an SLR equipped with an extension tube. He had even trained himself to hold his breath for up to two minutes, so that he could take his time and not disturb slowly exposing images.[3]

Vishniac's subjects varied throughout his life. At times, he would focus on documenting everyday life, as in Berlin, and later portraiture, doing famous portraits of Albert Einstein and Marc Chagall. He was also a pioneer in time-lapse photography, on which he worked from 1915 to 1918,[3][7] and again later in life.

[edit] Religion and philosophy

Roman Vishniac always had strong ties with his ancestry, especially the Jewish aspect of it, "From earliest childhood, my main interest was my ancestors". He was a Zionist[11][17] and a strong sympathizer with Jews who had suffered because of anti-Semitism, "Oh yes, I could be a professor of anti-Semitism", also stating then that he had one hundred and one relatives who died during the Holocaust. A famous photo of his (pictured right) of a store in Berlin selling devices for separating Jews and non-Jews by skull shape was used by him to criticize the pseudoscience of German anti-Semites.[17]

Vishniac associated much of his work with religion, though not specifically Judaism. "Nature, God, or whatever you want to call the creator of the Universe comes through the microscope clearly and strongly," he remarked in his laboratory one day.

Living with the memory of hardship, Vishniac was, "an absolute optimist filled with tragedy. His humanism is not just for Jews, but for every living thing." [22] He probably believed in God or some similar concept, but he was non-denominational and did not adhere strictly to the principles of any religion. He even clashed with Orthodox Jews in one well-known instance: The religious Jews he met on his trek around Europe would not let themselves be photographed, quoting the Bible and its prohibition of making of graven images. Vishniac's famous response was, "the Torah existed for thousands of years

before the camera had been invented." [17]

Vishniac was known for having great respect for all living creatures. Whenever possible, he returned a specimen to its precise home before it was captured [3] and one time "[lent] his bathtub to tadpoles for weeks until he could return them to their pond". In accordance with this philosophy, he photographed almost exclusively living subjects. [31]

[edit] Publications

Year

Title

Notes

Source

1947

Polish Jews: A Pictorial Record

Polish Jews showcased 31 images of the life and character of these people "stressing the spiritual side of the subjects' lives and [...] it did not include any of the pictures [Roman Vishniac] took to emphasize the economic struggle in which the Jews were engaged." [3] Essay by Abraham Joshua Heschel. [23]

1947

*Die Farshvundene Velt: Idishe shtet, Idishe mentshn.

*The Vanished World: Jewish Cities, Jewish People

Edited by Raphael Abramovitch; title, text and captions in English and Yiddish; includes photographs by R. Vishniac, A. Kacyzna, M. Kipnis and others. First edition of the earliest and most comprehensive graphic pictorial history of Jewish life at the beginning of the Nazi era.

[32][33]

1955

Spider, Egg and Microcosm: Three Men and Three Worlds of Science

Published by Eugene Kinkead (publisher); The three men were Petrunkevitch, Romanoff and Vishniac

[3]

1956

This Living Earth (Nature Program)

Published by N. Doubleday

[34]

1957

Mushrooms (Nature Program)

Prepared with the cooperation of the National Audubon Society; Published by N. Doubleday

[35]

1959

Living Earth

Drawings by Louise Katz; Subject: Soil biology

[36]

1969

A Day of Pleasure: Stories of a Boy Growing Up in Warsaw

Written by Isaac Bashevis Singer

[37]

1971

Building Blocks of Life: Proteins, Vitamins, and Hormones Seen Through the Microscope

Published by Charles Scribner's Sons

[3]

1972

The Concerned Photographer 2

Grossman Publishers; Edited by Cornell Capa, text by Michael Edelson; In cooperation with ICP

[3]

1974

Roman Vishniac

of the ICP Library of Photographers

[3]

1983

A Vanished World

Foreword by Elie Wiesel; this version is significantly different from the original version of 1947, being completely redone and with many fewer photographs. This is probably the best-known collection of Vishniac's and has independently contributed most to his popularity.

[38]

1985

Roman Vishniac

by Darilyn Rowan, published at Arizona State University School of Art.

[39]

1993

To Give them Light: The Legacy of Roman Vishniac

Biographical note by Mara Vishniac Kohn, edited by Marion Wiesel

[4]

1993

Roman Vishniac: The Platinum Prints

of the International Center of Photography

[40]

1999

Children of a Vanished World

Edited by Mara Vishniac Kohn and Hartman Flacks

[13]

2005

Roman Vishniac's Berlin

Edited by James Howard Fraser, Mara Vishniac Kohn and Aubrey Pomerance for Jewish Museum Berlin

[41]

For a more complete list of publications by and about Roman Vishniac, see pages 94 and 95 of Roman Vishniac published by ICP[3] and the Library of Congress archive.

[edit] Major exhibitions

Year

Location

Notes

Source

1943

Teacher's College, Columbia University, New York

One-man show of photographs of impoverished Eastern European Jews

[3][12]

1962

IBM Gallery, New York

One-man show; "Through the Looking Glass"

[3]

1971

The Jewish Museum, New York

"The Concerns of Roman Vishniac"; The first comprehensive showing of Vishniac's work, produced by ICP

[3]

1972â ^1973

Art Gallery of the University at Albany, The State University of New York; The Corcoran Gallery of Art, Washington D.C.; New Jersey Public Library, Fair Lawn; Kol Ami Museum, Los Angeles; Judaica Museum, Phoenix

"The Concerns of Roman Vishniac" circulated around the U.S.A. by ICP. This exhibit was probably a continuation of the last one at the Jewish Museum; however, it is listed as a separate production in Roman Vishniac

[3]

1993

International Center of Photography, New York

"Man, Nature, and Science, 1930â ^1985"

[7]

2001

Spertus Museum, Chicago

50 of Vishniacâ s photographs from Roman Vishniac Children of a Vanished World;

Mara Vishniac Kohn guest speaker

[14]

2005â ^2007

Jewish Museum Berlin, Goethe-Institut New York

Title: "Roman Vishniac's Berlin"; exhibiting 90 images in Berlin, some never before seen by the public.

[10][42][43]

2013

International Center of Photography, New York

Exhibition of unpublished photographs and ephemera

[2]

[edit] See also

[edit] Organizations

[edit] Photography

[edit] People

[edit] References

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Persondata

Name

Vishniac, Roman

Alternative names

Short description

Russian-American photographer

Date of birth

19 August 1897

Place of birth

Pavlovsk

Date of death

22 January 1990

Place of death

New York City

Starship Troopers is a military science fiction novel by Robert A. Heinlein, first published (in abridged form) as a serial in The Magazine of Fantasy & Science Fiction (October, November 1959, as "Starship Soldier") and published hardcover in December 1959.

The first-person narrative is about a young soldier from the Philippines named Juan "Johnnie" Rico and his exploits in the Mobile Infantry, a futuristic military service branch equipped with powered armor. Rico's military career progresses from recruit to non-commissioned officer and finally to officer against the backdrop of an interstellar war between mankind and an arachnoid species known as "the Bugs". Rico and the other characters discuss moral and philosophical aspects of suffrage, civic virtue, juvenile delinquency, capital punishment, and war.[3]

Starship Troopers won the Hugo Award for Best Novel in 1960.[4] The novel has attracted controversy and criticism for its social and political themes including allegations of advocating fascism or militarism.[5]

[edit] Heinlein's military background and political views

Heinlein graduated from the U.S. Naval Academy in 1929, and served on active duty in the U.S. Navy for five years. He served on the then new aircraft carrier USS Lexington in 1931, and as a naval lieutenant aboard the destroyer USS Roper between 1933 and 1934, until he was forced to leave the Navy because of pulmonary tuberculosis. Heinlein never served in active combat while a Navy officer and he was a civilian during World War II doing research and development at the Philadelphia Navy Yard.[6] Heinlein's non-combat Naval service would become a point of contention in later criticism of Starship Troopers.

According to Heinlein, his desire to write Starship Troopers was sparked by the publication of a newspaper advertisement placed by the National Committee for a Sane Nuclear Policy on April 5, 1958 calling for a unilateral suspension of nuclear weapon testing by the United States. In response, Robert and Virginia Heinlein created the small "Patrick Henry League" in an attempt to create support for the U.S. nuclear testing program. Heinlein found himself under attack both from within and outside the science fiction community for his views. The novel may, perhaps, be viewed as Heinlein clarifying and defending his military and political views of the time.[7]

[edit] Writing of the novel

Some time during 1958 and 1959, Heinlein ceased work on the novel that would become Stranger in a Strange Land and wrote Starship Troopers. It was first

published in The Magazine of Fantasy & Science Fiction in October and November 1959 as a serial called Starship Soldier. Although originally written as a juvenile novel for New York publishing house Scribner, it was rejected,[8] prompting Heinlein to cease writing juvenile fiction for Scribners, to end his association with them completely, and begin writing books with more adult themes.[9] The novel was eventually published as teenage fiction by G. P. Putnam's Sons.[10]

Starship Troopers takes place in the midst of an interstellar war between the Terran Federation of Earth and the Arachnids (referred to as "The Bugs") of Klendathu. It is narrated as a series of flashbacks by Juan Rico, and is one of only a few Heinlein novels set out in this fashion.[11] The novel opens with Rico aboard the corvette Rodger Young (named after Medal of Honor winner Rodger Wilton Young), serving with the platoon known as "Rasczak's Roughnecks" (named after the platoon leader, Lt. Rasczak) about to embark on a raid against the planet of the "Skinies", who are allies of the Arachnids. We learn that he is a cap(sule) trooper in the Terran Federation's Mobile Infantry. The raid itself, one of the few instances of actual combat in the novel, is relatively brief: the Roughnecks land on the planet, destroy their targets, and retreat, suffering a single casualty in the process (Dizzy Flores, who dies in the retrieval boat of wounds received in action).

The story then flashes back to Rico's graduation from high school, and his decision to sign up for Federal Service over the objections of his father, who disowns him. This is the only chapter that describes Rico's civilian life, and most of it is spent on the monologues of two people: retired Lt. Col. Jean V. Dubois, Rico's school instructor in "History and Moral Philosophy"; and Fleet Sergeant Ho, a recruiter for the armed forces of the Terran Federation.

Some see Dubois as speaking for Heinlein throughout the novel; he delivers what is probably the book's most famous soliloquy on violence: "[It] has settled more issues in history than has any other factor." [12] Fleet Sergeant Ho's monologues examine the nature of military service, and his anti-military tirades seem primarily to be a contrast with Dubois. We learn, later, that his rants are part of a policy intended to scare off applicants signing up without conviction.

Interspersed throughout the book are other flashbacks to Rico's high school History and Moral Philosophy course, which describe how in the Terran Federation of Rico's day, the rights of a full Citizen (to vote, and hold public office) must be earned through some form of volunteer Federal service. Those residents who have not exercised their right to perform this Federal Service retain all other rights generally associated with a modern democracy (free speech, assembly, etc.), but they cannot vote or hold public office. This structure arose ad hoc after the collapse of the "20th century Western democracies", brought on by both social failures at home (among which appear to be poor handling of juvenile delinquency) and military defeat by the Chinese Hegemony overseas.[13]

In the next section of the novel, after being denied all his higher preferred Service choices, Rico goes to boot camp at Camp Arthur Currie, on the northern prairies. Five chapters are spent exploring Rico's experience there, including his adjustment to a very different situation, entering the service under the training of the leading instructor, career Ship's Sergeant Charles Zim. Camp Currie is rigorous by design; less than ten percent of the recruits finish basic training. The rest either resign, are expelled, or die in training. One of the chapters deals with Ted Hendrick, a fellow recruit and constant complainer who is flogged and expelled for striking a superior officer during a simulated combat exercise (he caught Sgt. Zim by surprise after being struck by the sergeant for failure to perform during the exercise). Another recruit, a deserter who murdered a baby girl while AWOL, is hanged by his battalion after his arrest by civilian police and return to Camp Currie. Rico himself is flogged for poor handling of (simulated) nuclear weapons during a drill; despite these experiences, he eventually graduates and is assigned to a unit in the Fleet.

At some point during Rico's training, the "Bug War" has changed from border incidents to a full-fledged formal war, and Rico finds himself taking part in combat operations. The war "officially" starts with an Arachnid attack that annihilates the city of Buenos Aires (which kills Juan's mother who was visiting there), although Rico makes it clear that prior to the attack there had been many "'incidents', 'patrols', or 'police actions'".[14] Rico briefly describes the Terran Federation's loss at the Battle of Klendathu during which his unit is decimated and his ship destroyed. Following Klendathu, the Terran Federation is reduced to making hit-and-run raids similar to the one described at the beginning of the novel (which, chronologically, would be placed between chapters 10 and 11). Rico meanwhile finds himself posted to Rasczak's Roughnecks. This part of the book focuses on the daily routine of military life, as well as the relationship between officers and non-commissioned officers, personified in this case by Rasczak and Sergeant Jelal.

Eventually, Rico decides to become a career soldier, and one of his fellow troopers claims he is officer material and should consider volunteering for Officer Candidate School. He applies and is accepted. It turns out to be just like boot camp, only "squared and cubed with books added".[15] Rico manages to make it through to the final exam, "in the Fleet". He is commissioned a temporary Third Lieutenant for his field-test and commands his own unit during Operation Royalty. It is revealed at the end of the chapter that one of the enlisted men he leads into combat is his former basic training instructor, Sergeant Zim. Although personally convinced that he badly mismanaged his men, he passes the final exam, and graduates as a Second Lieutenant.

Rico has a meeting with his father, who had volunteered for Service after his wife, Rico's mother, was killed at Buenos Aires. The final chapter serves as more of a coda, depicting Rico aboard the Rodger Young as the lieutenant in command of Rico's Roughnecks, preparing to drop to Klendathu as part of a major strike, his father being his senior sergeant, and a Native American Third Lieutenant-in-training (James Bearpaw, known as "Jimmie") of his own under instruction.

[edit] Major themes

[edit] Politics

Starship Troopers seems to have been meant as a political essay as well as a novel. Large portions of the book take place in classrooms, with Rico and other characters engaged in debates with their History and Moral Philosophy teacher, who is often thought to be speaking in Heinlein's voice.[citation needed] The overall theme of the book is that social responsibility requires being prepared to make individual sacrifice. Heinlein's Terran Federation is a limited democracy, with aspects of a meritocracy in regard to full citizenship, based on voluntarily assuming a responsibility for the common weal. Suffrage can only be earned by those willing to serve their society by at least two years of volunteer Federal Service â ^ "the franchise is today limited to discharged veterans", (ch. XII), instead of, as Heinlein would later note, anyone "...who is 18 years old and has a body temperature near 37Â Â°C"[16] The Federation is required to find a place for anyone who desires to serve, regardless of his skill or aptitude (this also includes service ranging from teaching to dangerous non-military work such as serving as experimental medical test subjects to military service -- such as Rico's Mobile Infantry).

There is an explicit contrast to the "democracies of the 20th century", which according to the novel, collapsed because "people had been led to believe that they could simply vote for whatever they wanted... and get it, without toil, without sweat, without tears."[17] Indeed, Colonel Dubois criticizes as unrealistic the famous U.S. Declaration of Independence line concerning "life, liberty and the pursuit of happiness". No one can stop anyone from pursuing happiness, but the Colonel claims life and liberty exist only if they are deliberately sought and, often, bought painfully by great effort and sacrifice.

Starship Troopers is also widely-regarded as a vehicle for Heinlein's anti-communist views. Characters attack Karl Marx (a "pompous fraud"), the labor theory of value ("All the work one cares to add will not turn a mud pie

into an apple tart..."),[18] and Plato's The Republic ("ant-like communism" and "weird in the extreme").[19]

[edit] Military history, traditions, and military science

The Korean War ended only five years before Heinlein began writing *Starship Troopers*, and the book makes several direct references to it, such as the claim that "no 'Department of Defense' ever won a war." [20] Heinlein also refers to the American prisoners of war taken in that conflict, including the popular accusations of Communist brainwashing.[21] After the Korean War ended, there were rumors that the Chinese and North Koreans continued to hold a large number of Americans.[22] Rico's History and Moral Philosophy class at Officer Candidate School has a long discussion about whether it is moral to never leave a single man behind, even at the risk of starting a new war. Rico debates whether it was worth it to risk two nations' futures over a single fellow soldier who might not even deserve to live by some standard, but concludes it "doesn't matter whether it's a thousand â ^ or just one, sir. You fight." [23]

Several references are made to other wars: these include the name of the starship that collided with Valley Forge; Ypres, a major battleground in World War I; the starship Mannerheim, a reference to the World War II-era marshal of Finland; and Rico's boot camp, Camp Arthur Currie (named after Sir Arthur Currie who commanded the Canadian Corps during WWI). A brief reference is also made to Camp Sergeant Smokey Smith, named after a Canadian recipient of the Victoria Cross in World War II. The airport was the location of the U.S. Army Air Corps' Walla Walla Army Air Base in World War II. The 91st Bomb Group lays claim to being the first Army Air Forces outfit to use that base. Another World War I reference was the phrase "Come on, you apes! You wanna live forever?", which comes from Gunnery Sergeant Dan Daly at the Battle of Belleau Wood (although instead of "apes", Daly said "sons of bitches"). This phrase, however, has been attributed to various people throughout military history, including perhaps the earliest documented citation by Frederick II of Prussia when he was meant to have said "Kerls, wollt ihr ewig leben?" (tr. "Men, would you live forever?") at the Battle of KolÅ-n. The starship corvette Rodger Young was named after the World War II Medal of Honor recipient, and lines from the chorus of Frank Loesser's *Ballad of Rodger Young* are used as the ship's recall signal. Another war reference, this one from the War of 1812, involves some implications of the court-martial of Third Lieutenant William Sitgreaves Cox, which are discussed in some detail.

[edit] Military innovations

In addition to Heinlein's political views, *Starship Troopers* popularized a number of military concepts and innovations, some of which have inspired real life research. The novel's most noted innovation is the powered armor exoskeletons used by the Mobile Infantry.[24] These suits were controlled by the wearer's own movements, but powerfully augmented a soldier's strength, speed, weight carrying capacity (which allowed much heavier personal armament), jumping ability (including jet and rocket boost assistance), and provided the wearer with improved senses (infrared vision and night vision, radar, and amplified hearing), a completely self-contained personal environment including a drug-dispensing apparatus, sophisticated communications equipment, and tactical map displays. Their powered armor made the Mobile Infantry a hybrid between an infantry unit and an armored one.

Another concept the book pioneered was that of "space-borne infantry". The heavily mechanized units of M.I. troops were attached to interstellar troop transport spacecraft, which then delivered them to planetary target zones, by dropping groups of Mobile Infantrymen onto the planet surface from orbit via individual re-entry capsules (hence the book's slang term "cap troopers" for M.I. troops). The uses for such a forceâ ~ranging from smash-and-burn raids, to surgical strikes, conventional infantry warfare, and holding beachheadsâ ~and the tactics that might be employed by such soldiers are described extensively within the novel. The tactics, training, and many other aspects of this futuristic elite force are carefully detailed: everything from the function of the armored suits themselves, to the need for multiple variants of powered

armor, to the training of personnel in both suit operations and the specialized unit tactics that would be needed, to the operational use of the suits in combat.

[edit] Influence with U.S. military

While powered armor is *Starship Troopers'* most famous legacy, its influence extends deep into contemporary militaries. Over half a century after its publication, *Starship Troopers* is on the reading lists of the United States Marine Corps[25][26][27] and the United States Navy.[28] It is the first science fiction novel on the reading lists at three of the five United States military branches. When Heinlein wrote *Starship Troopers* the United States military was a largely conscripted force, with conscripts serving two-year hitches. Today the U.S. military has incorporated many ideas similar to Heinlein's concept of an all-volunteer, high-tech strike force. In addition, references to the book keep appearing in military culture. In 2002 a marine general described the future of Marine Corps clothing and equipment as needing to emulate the Mobile Infantry.[29] In 2012, an article on the US military buying ballistic face masks specifically referenced the "big steel gorilla[s]" of *Starship Troopers*. [30]

[edit] Controversy

To Heinlein's surprise,[31] *Starship Troopers* won the Hugo Award for Best Novel in 1960.[4] By 1980, twenty years after its release, it had been translated into eleven languages and was still selling strongly. However, Heinlein complained that, despite this success, almost all the mail he received about it was negative and he only heard about it "when someone wants to chew me out." [32]

[edit] Literary critiques

The main literary criticism against *Starship Troopers* is that it is nothing more than a vehicle for Heinlein's political views. John Brunner compared it to a "Victorian children's book" [33] while Anthony Boucher, founder of *The Magazine of Fantasy & Science Fiction*, remarked that Heinlein had "forgotten to insert a story." [33] Alexei Panshin complained that the novel was overly simplistic "an account of the making of a [Marine] ... and nothing more" [34] and that the characters were simply mouthpieces for Heinlein: "At the end you know nothing of [Rico's] tastes, his likes and dislikes, his personal life. The course of the book changes him in no way because there is nothing to change â ^ Rico remains first and last a voice reading lines about how nice it is to be a soldier.... The other characters are even more sketchy, or are simple expositions of an attitude." [34] Richard Geib adds "The real life 'warriors' I have known are all more multi-faceted than anyone we meet in *Starship Troopers*. And the ones I know who have killed are much more ambivalent about having done so." [35] He further complained about the almost complete lack of sexuality among the characters and the absence of any serious romance. [35]

In his review column for *F&SF*, Damon Knight selected the novel as one of the 10 best genre books of 1959. [36]

In a 2009 retrospective, Jo Walton finds *Starship Troopers* "military SF done extremely well." [37] "Heinlein was absolutely at his peak when he wrote this in 1959. He had so much technical stylistic mastery of the craft of writing science fiction that he could do something like this [per Walton, he tells the story "backwards and in high heels"] and get away with it." "It's astonishing that [*Starship Troopers* is] still controversial now, fifty years after it was first published," and "Probably [Heinlein would] have been delighted at how much the book has made people think and argue." [37]

[edit] Allegations of militarism

Another complaint about *Starship Troopers* is that it is either militaristic or pro-military. There was a two-year debate in the Proceedings of the Institute for Twenty-First Century Studies (PITFCS) that was sparked by a comparison between a quote in *Starship Troopers* that "the noblest fate that a man can endure is to place his own mortal body between his loved home and war's desolation" [38] (paraphrase of the fourth stanza of "The Star-Spangled Banner") and the anti-war poem "Dulce et Decorum Est" by Wilfred Owen. [33] Dean

McLaughlin called it "a book-length recruiting poster." [33] Alexei Panshin, a veteran of the peacetime military, argued that Heinlein glossed over the reality of military life, and that the Terran Federation-Arachnid conflict existed simply because, "Starship troopers are not half so glorious sitting on their butts polishing their weapons for the tenth time for lack of anything else to do." [34] Joe Haldeman, a Vietnam veteran and author of the anti-war Hugo [39]- and Nebula [40]-winning science fiction novel *The Forever War*, similarly complained that *Starship Troopers* unnecessarily glorifies war. [41]

Defending Heinlein, George Price argued that "[Heinlein] implies, first, that war is something 'endured,' not enjoyed, and second, that war is so unpleasant, so desolate, that it must at all costs be kept away from one's home." [33] In a commentary on his essay "Who Are the Heirs of Patrick Henry?", Heinlein agreed that *Starship Troopers* "glorifies the military ... Specifically the P.B.I., the Poor Bloody Infantry, the mudfoot who places his frail body between his loved home and the war's desolation â ^ but is rarely appreciated... he has the toughest job of all and should be honored." [42] The book's dedication also reads in part "... to all sergeants everywhere who have labored to make men out of boys." [43] Heinlein also received some complaints about the lack of conscription in *Starship Troopers* (the military draft was the law in the United States when he wrote the novel). [44]

[edit] Allegations of fascism

Another accusation is that the Terran Federation is a fascist society, and that *Starship Troopers* is therefore an endorsement of fascism. These allegations have become so popular that Sircar's Corollary of Godwin's Law states that once Heinlein is brought up during online debates, "Nazis or Hitler are mentioned within three days." [45] The most visible proponent of these views is probably Paul Verhoeven, whose film version of *Starship Troopers* portrayed the Terran Federation's personnel wearing uniforms strongly reminiscent of those worn by the Third Reich-era Wehrmacht; but Verhoeven admits that he never finished reading the actual book. [46] Most of the arguments for this view cite the idea that only veterans can vote and non-veterans lack full citizenship; moreover, only veterans are permitted to teach the course "History & Moral Philosophy", children are taught that moral arguments for the status quo are mathematically correct, and both capital and corporal punishment are accepted as methods of teaching morality and reducing crime. Federal Service is not necessarily military, although it is suggested that hardship and strict discipline are pervasive. According to Poul Anderson, Heinlein got the idea not from Nazi Germany or Sparta, but from Switzerland. [13]

Defenders of the book usually point out that although the electoral franchise is limited, the government of the Terran Federation is democratically elected. There is freedom of speech, freedom of the press, and freedom of conscience for non-citizens ("residents"). The military service is entirely volunteer, with no conscription: infantrymen can even resign just before being sent into combat, with no sanction other than discharge without the right to citizenship and the vote. The society described in the book is multiracial, multi-religious, and multi-ethnic. The protagonist Juan Rico is Filipino and others in his training group are American, Japanese, German, Australian, and Turkish, and one or two have recognizably Jewish last names. Women play a prominent role in the military, especially as pilots and ships' captains. Many also argue that Heinlein was simply discussing the merits of a "selective versus nonselective franchise." [33] [volume & issue needed] Heinlein made a similar claim in his *Expanded Universe* and further noted that 95% of "veterans" were not military personnel but members of the civil service and that only retired veterans could vote or hold office. [47]

However, this issue is still controversial, even among the book's defenders. James Gifford [8] and David Dyer-Bennet [48] point to several quotes as indications that the characters assume Federal Service is military; for instance, when Rico tells his father he is interested in Federal Service, his father immediately explains his belief that Federal Service is a bad idea because there is no war in progress, indicating that he sees Federal Service as

military in nature, or not necessary to a businessman during peacetime. Some Federal Service recruiters wear military ribbons, and a term of service "is either real military service... or a most unreasonable facsimile thereof." Moreover, the history of Federal Service describes it as being started by military veterans who did not originally allow civilians to join and are not described as allowing them to join later. Gifford decides, as a result, that although Heinlein's intentions may have been that Federal Service be 95% non-military, in relation to the actual contents of the book, Heinlein "is wrong on this point. Flatly so."

[edit] Allegations of utopianism

More recently, the book has been analyzed as a utopia (in the sense of a society that does not, and cannot, exist), and that while Heinlein's ideas sound plausible, they have never been put to the test. This criticism has been leveled by writers such as Robert A. W. Lowndes, Philip JosÃ© Farmer, and Michael Moorcock. The latter wrote an essay entitled "Starship Stormtroopers" in which he attacked Heinlein and other writers over similar "Utopian fiction." [49] Lowndes accused Heinlein of using straw man arguments, "countering ingenuous half-truths with brilliant half-truths." [33] Lowndes further argued that the Terran Federation could never be as idealistic as Heinlein portrays it to be because he never properly addressed "whether or not [non-citizens] have at least as full a measure of civil redress against official injustice as we have today". [33] Farmer also agreed, arguing that a "world ruled by veterans would be as mismanaged, graft-ridden, and insane as one ruled by men who had never gotten near the odor of blood and guts." [33]

[edit] Allegations of racism

The supposedly racist aspects of Starship Troopers involve the Terrans' relations with the Bugs and the Skinnies. Richard Geib has suggested that Heinlein portrayed the individual Arachnids as lacking "minds or souls... killing them seems no different from stepping on ants." [35] Both Robert Peterson and John Brunner believe that the nicknames "Bugs" and "Skinnies" carry racial overtones, Brunner using the analogy of the Korean word for person "gook" [33] while Peterson suggested that "not only does the nickname 'Bugs' for the arachnids of Klendathu sound too much like a racial slur â ^ think of the derogatory use of the word 'Jew' â ^ but Heinlein's characters unswervingly believe that humans are superior to Bugs, and that humans are destined to spread across the galaxy." [50]

Robert A. W. Lowndes argues that the war between the Terrans and the Arachnids is not about a quest for racial purity, but rather an extension of Heinlein's belief that man is a wild animal. According to this theory, if man lacks a moral compass beyond the will to survive, and he was confronted by another species with a similar lack of morality, then the only possible moral result would be warfare. [33]

[edit] Adaptations

In 1976, Avalon Hill published Robert Heinlein's Starship Troopers, a map-and-counter board wargame featuring a number of scenarios as written in the novel. [51]

In 1997, as a tie-in with Verhoeven's film adaptation, Avalon later published Starship Troopers: Prepare For Battle!, which entirely focused on the film. [52]

In 2005, Mongoose Publishing published Starship Troopers: The Miniatures Game, a miniature wargame which used material from both the novel and the film. [53]

[edit] Computer

In 1982, Radio Shack/Tandy Corporation published Klendathu by Leo Christopherson for the TRS-80 Model I/II/III and Color Computer. [54]

In 1998, Mythic Entertainment [55] released Starship Troopers: Battlespace which was available to America Online subscribers. The game, in which players battled each other in overhead space combat, allowed players to assume either Klendathu or Federation roles.

In 2000, Blue Tongue Entertainment released the top-down real-time tactics video game Starship Troopers: Terran Ascendancy. [56]

A first-person shooter game titled Starship Troopers was released November 15,

2005, based on Paul Verhoeven's film version rather than on Heinlein's novel. It was developed by Strangelite and published by Empire Interactive.

November 13, 2012 a mobile game that acts as a prequel to the series called Starship Troopers: Invasion "Mobile Infantry" was released worldwide via the App Store (iOS).

[edit] Pinball

In 1997, Sega Pinball (now Stern Pinball) released the Starship Troopers pinball machine, based on the movie adaptation that was released that year.

[edit] Animated

In 1988, from October to December, Sunrise and Bandai Visual produced a 6-episode Japanese original video animation locally titled *UchÅ« no Senshi* with mobile infantry power armor designs by Kazutaka Miyatake (famous for his work on Macross/Robotech).

In August 1999, an animated series, *Roughnecks: Starship Troopers Chronicles*, which took inspiration from both the novel and the first (1997) film, lasted 40 episodes until April 2000.

In July 2012, an animated movie entitled *Starship Troopers: Invasion* (2012) was released on DVD and Blu-ray. It features new characters, with Rico, now a General, playing a supporting role.

The film rights to the novel were licensed in the 1990s.[57] The first film, also titled *Starship Troopers*, was directed by Paul Verhoeven (*RoboCop*, *Total Recall*) and released in 1997. The film diverged greatly in terms of the themes and plot of the novel, and received mixed reviews from critics.[58] Two sequels followed: *Starship Troopers 2: Hero of the Federation* (2004), and *Starship Troopers 3: Marauder* (2008).

In December 2011, Neal H. Moritz, producer of films such as *The Fast and the Furious* series and *I Am Legend*, announced plans to do a remake of the film that promises to be more faithful to the source material.[59]

[edit] Cultural influence

Starship Troopers influenced many later science fiction stories, setting a tone for the military in space, a type of story referred to as military science fiction. John Steakley's novel *Armor* was, according to the author, born out of frustration with the small amount of actual combat in *Starship Troopers* and because he wanted this aspect developed further.[60] Conversely, Joe Haldeman's anti-war novel *The Forever War* is popularly thought to be a direct reply to *Starship Troopers*, and though Haldeman has stated that it is actually a result of his personal experiences in the Vietnam War, he has admitted to being influenced by *Starship Troopers*. [41] Haldeman's historical novel 1968 has a soldier going crazy in Vietnam: he imagines himself killing alien bugs in a battlesuit, instead of actual Vietnamese people.[37]

Ender's Game by Orson Scott Card is also thought by many to have been either a direct response to or influenced by *Starship Troopers*. Card has flatly denied this, saying that he never read the novel and did not read *The Forever War* until after writing *Ender's Game*. [61] Harry Harrison wrote a satirical book called *Bill, the Galactic Hero* which he described as "a piss-take on Heinlein's *Starship Troopers*." [62] John Scalzi's novel *Old Man's War* is, according to the author, explicitly patterned after *Starship Troopers*. [63] In recent years, John Ringo's series *Legacy of the Aldenata* (also known as the *Posleen* series) featured a more explicit homage to Heinlein's book. In 1987, a Choose Your Own Adventure-style interactive book set in the *Starship Troopers* universe, *Combat Command in the World of Robert A. Heinlein's Starship Troopers: Shines the Name* by Mark Acres, was published by Ace Publishers.

[edit] Film and television

The 1986 James Cameron film *Aliens* incorporated themes and phrases from the novel, such as the terms "the drop" and "bug hunt", as well as the cargo-loader exoskeleton. The actors playing the Colonial Marines were also required to read *Starship Troopers* as part of their preparation prior to filming.[64]

Yoshiyuki Tomino, the creator of the mecha anime TV series *Mobile Suit Gundam* (1979) has cited *Starship Troopers* as an important inspiration. He coined the term "mobile suit" used to name the piloted mecha from the anime series as a

reference to the novel's own "mobile infantry". The Gundam series are notable because they started the Real Robot genre of mecha anime that continues to be portrayed in several Japanese sci-fi productions to this very day.[65][66]

Starship Troopers is thought to have influenced numerous games including Outwars,[67] Tribes, Tribes 2,[68] StarCraft,[69] Warhammer 40k, Crysis and Halo: Combat Evolved. On November 13, 2012 Spectre Media, LLC released Starship Troopers: Invasion "Mobile Infantry" for iOS devices, which acts as a prequel to the 2012 Starship Troopers: Invasion film by Shinji Aramaki.

[edit] Comics

Dark Horse Comics, Mongoose Publishing and Markosia have held the license to produce comic books based on Starship Troopers. Over the years, the writers have included Warren Ellis, Gordon Rennie and Tony Lee.[70][71]

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1960-06-01, Putnam Publishing Group, hardcover, ISBN 0-399-20209-9

May 1968, Berkley Medallion Edition, paperback, ISBN 0-425-02945-X and ISBN 0-425-03787-8

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November 1985, Berkley Publishing Group, paperback, ISBN 0-425-09144-9

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1987-05-01, Ace Books, paperback, 263 pages, ISBN 0-441-78358-9

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1997-12-01, Blackstone Audiobooks, cassette audiobook, ISBN 0-7861-1231-X

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2000-01-01, Blackstone Audiobooks, CD audiobook, ISBN 0-7861-9946-6

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Weuve, Christopher. *Thoughts on Starship Troopers*. Examines some of the issues surrounding Heinlein's version and Verhoeven's version.

[edit] External links

[edit] Related information

Katharine Hepburn

Studio publicity photograph, ca. 1941

Born

Katharine Houghton Hepburn(1907-05-12)May 12, 1907Hartford, Connecticut, U.S.

Died

June 29, 2003(2003-06-29) (aged 96)Fenwick, Connecticut, U.S.

Alma mater

Bryn Mawr College

Occupation

Actress

Years active

1928â ~1994

Spouse(s)

Ludlow Ogden Smith (1928â ~1934)

Partner(s)

Spencer Tracy (1941â ~1967, his death)

Parents

Katharine Martha Houghton Hepburn

Thomas Norval Hepburn

Awards

4 Academy Awards, 2 BAFTAs, 1 Emmy (full list)

Katharine Houghton Hepburn (May 12, 1907 â ^ June 29, 2003) was an American actress of film, stage, and television. Known for her headstrong independence and spirited personality, Hepburn's career as a Hollywood leading lady spanned more than 60 years. Her work came in a range of genres, from screwball comedy to literary drama, and she received four Academy Awards for Best Actressâ ~a record for any performer. Hepburn's characters were often strong, sophisticated women with a hidden vulnerability.

Raised in Connecticut by wealthy, progressive parents, Hepburn began to act while studying at Bryn Mawr College. After four years in the theatre, favorable reviews of her work on Broadway brought her to the attention of Hollywood. Her early years in the film industry were marked with success, including an Academy Award for her third picture, *Morning Glory* (1933), but this was followed by a series of commercial failures. In 1938 she was labeled "box office poison". Hepburn masterminded her own comeback, buying out her contract with RKO Radio Pictures and acquiring the film rights to *The Philadelphia Story*, which she sold on the condition that she be the star. In the 1940s she was contracted to Metro-Goldwyn-Mayer, where her career focused on an alliance with Spencer Tracy. The screen-partnership spanned 25 years, and produced nine movies.

Hepburn challenged herself in the latter half of her life, as she regularly appeared in Shakespeare stage productions and tackled a range of literary roles. She found a niche playing middle-aged spinsters, such as in *The African Queen* (1951), a persona the public embraced. Three more Oscars came for her work in *Guess Who's Coming to Dinner* (1967), *The Lion in Winter* (1968), and *On Golden Pond* (1981). In the 1970s she began appearing in television movies, which became the focus of her career in later life. She remained active into old age, making her final screen appearance in 1994 at the age of 87. After a period of inactivity and ill-health, Hepburn died in 2003 at the age of 96.

Hepburn famously shunned the Hollywood publicity machine, and refused to conform to societal expectations of women. She was outspoken, assertive, athletic, and wore trousers before it was fashionable for women to do so. She married once, as a young woman, but thereafter lived independently. A 26-year affair with her co-star Spencer Tracy was hidden from the public. With her unconventional lifestyle and the independent characters she brought to the screen, Hepburn came to epitomize the "modern woman" in 20th-century America and helped change perceptions of women. In 1999, she was named by the American Film Institute as the top female Hollywood legend.[1]

[edit] Early life

Hepburn was born in Hartford, Connecticut, on May 12, 1907, the second of six children. Her parents were Thomas Norval Hepburn (1879â ~1962), a urologist at Hartford Hospital, and Katharine Martha Houghton (1878â ~1951), a feminist campaigner. Both fought for social change in America: Thomas Hepburn helped establish the New England Social Hygiene Association, which educated the public about venereal disease,[2] while Katharine Martha headed the Connecticut Woman Suffrage Association and later campaigned for birth control with Margaret Sanger.[3] As a child, Hepburn joined her mother on several "Votes For Women" demonstrations.[4] The Hepburn children were raised to exercise freedom of

speech and encouraged to think and debate on any topic they wished.[5] Her parents were criticized by the community for their progressive views, which stimulated Hepburn to fight against barriers she encountered.[6][7] Hepburn said she realized from a young age that she was the product of "two very remarkable parents",[8] and credited her "enormously lucky" upbringing with providing the foundation for her success.[9][10] She remained close to her family throughout her life.[11]

The young Hepburn was a tomboy who liked to call herself Jimmy and cut her hair short like a boy's.[12] Thomas Hepburn was eager for his children to use their minds and bodies to the limit, and taught them to swim, run, dive, ride, wrestle, and play golf and tennis.[13] Golf became a passion for his oldest daughter: she took daily lessons and became very good, reaching the semi-final of the Connecticut Young Women's Golf Championship.[14] She loved swimming in Long Island Sound, and took ice-cold baths every morning in the belief that "the bitterer the medicine, the better it was for you." [15] Hepburn was a fan of movies from a young age, and went to see one every Saturday night.[16] With her friends and siblings, she would put on plays and perform to her neighbors for 50 cents a ticket to raise money for the Navajo people.[17]

On April 3, 1921, while visiting friends in Greenwich Village, Hepburn discovered the body of her older brother Tom, whom she adored,[18] dead from an apparent suicide. He had tied a sheet around a beam and hanged himself.[19] The Hepburn family denied it was suicide and maintained that Tom's death must have been an experiment that had gone wrong.[20] The incident made the teenage Hepburn nervous, moody, and suspicious of people.[21] She shied away from other children, dropped out of Oxford School, and began receiving private tutoring.[22] For many years, she used Tom's birthday (November 8) as her own. It was not until her 1991 autobiography, *Me: Stories of My Life*, that Hepburn revealed her true birth date.[23]

In 1924, Hepburn gained a place at Bryn Mawr College. She attended the institution primarily to satisfy her mother, who had studied there, and recalled disliking the experience.[24] It was the first time she had been in school for several years, and she was self-conscious and uncomfortable with her classmates.[25] She struggled with the scholastic demands of university, and was once suspended for smoking in her room.[26] Hepburn was drawn to acting but roles in college plays were conditional on good grades. Once her marks had improved, she began performing regularly.[26] The lead role in a production of *The Woman in the Moon* in her senior year, and the positive response it received, cemented Hepburn's plans to pursue a theatrical career.[14] She graduated with a degree in history and philosophy in June 1928.[27]

[edit] Career

[edit] Breaking into theatre (1928â ~1932)

Hepburn left Bryn Mawr determined to become an actress.[28] The day after graduating,[29] she traveled to Baltimore to meet Edwin H. Knopf, who ran a successful stock theatre company. Impressed by her eagerness, Knopf cast Hepburn in his current production, *The Czarina*. [30] She received good reviews for her small role; the *Printed Word* described her performance as "arresting". [31] She was given a part in the following week's show, but here Hepburn was less accomplished. She was criticized for her shrill voice, and so left Baltimore to study with an acclaimed voice tutor in New York City.[32]

Knopf decided to produce *The Big Pond* in New York and called for Hepburn to be the understudy to the leading lady. A week before opening, the lead was fired and replaced with Hepburn, which gave her a starring role after only four weeks in the theatre.[33] On opening night, Hepburn turned up late, mixed her lines, tripped over her feet, and spoke too high and fast to be comprehensible.[32] She was promptly fired, and the original leading lady rehired. Undeterred, Hepburn joined forces with producer Arthur Hopkins, and accepted the role of a schoolgirl in *These Days*. Her Broadway debut came on November 12, 1928, at the Cort Theatre, but reviews for the show were poor and it closed after eight nights.[32] Hopkins promptly hired Hepburn as the lead understudy in Philip Barry's play *Holiday*. In early December, after only two weeks, she quit to

marry Ludlow Ogden Smith, her beau from college. She planned to leave the theatre behind, but began to miss the work and quickly resumed the understudy role in *Holiday*, which she held for six months.[34]

In 1929, Hepburn turned down a role with the Theatre Guild to play the lead in *Death Takes a Holiday*. She felt the role was perfect,[35] but again she was fired.[36] Hepburn went back to the Guild and took an understudy role for minimum pay in *A Month in the Country*. In the spring of 1930, Hepburn joined a stock company in Stockbridge, Massachusetts. She left halfway through the summer season, and continued studying with a drama tutor.[37] In early 1931, she was cast in the Broadway production of *Art and Mrs. Bottle*. She was released from the role after the playwright took a dislike to her, saying "She looks a fright, her manner is objectionable, and she has no talent", but then rehired when no other actress could be found.[38] It went on to be a small success.[39]

Hepburn appeared in a number of plays with a summer stock company in Ivoryton, Connecticut, and she proved to be a hit.[38] During the summer of 1931, Philip Barry asked her to appear in his new play, *The Animal Kingdom*, alongside Leslie Howard. They began rehearsals in November, Hepburn feeling sure this was the role to make her a star, but Howard disliked the actress and again she was fired.[40] When she asked Barry why she had been let go, he responded, "Well, to be brutally frank, you weren't very good." [40] This unsettled the self-assured Hepburn, but she continued to look for work.[41] She took a small role in an upcoming play, but as rehearsals began she received an offer to read for the lead role in the Greek fable *The Warrior's Husband*. [42]

The Warrior's Husband proved to be Hepburn's break-out performance. Biographer Charles Higham states that the play was ideal for the actress, requiring an aggressive energy and athleticism, and she enthusiastically involved herself with its production.[43] It opened on March 11, 1932, at the Morosco Theatre on Broadway. Hepburn's first entrance called for her to leap down a narrow stairway with a stag over her shoulder, wearing a short silver tunic. The show ran for three months, and Hepburn received positive reviews.[44] Richard Garland of the *New York World-Telegram* wrote, "It's been many a night since so glowing a performance has brightened the Broadway scene." [45]

[edit] Hollywood success (1932â ~1934)

A scout for the Hollywood agent Leland Hayward spotted Hepburn's appearance in *The Warrior's Husband*, and asked her to test for the part of Sydney Fairfield in the upcoming RKO film *A Bill of Divorcement*. Hepburn was unhappy with her test scene, and sent material from *Holiday* instead.[46] Director George Cukor was impressed by what he saw: "There was this odd creature," he recalled, "she was unlike anybody I'd ever heard." He particularly liked the manner in which she picked up a glass: "I thought she was very talented in that action." [47] Offered the role, Hepburn demanded \$1,500 a week, a large amount for an unknown actress.[48] Cukor encouraged the studio to accept her demands[28] and they signed Hepburn to a temporary contract with a three-week guarantee.[49] RKO head David O. Selznick recounted that he took a "tremendous chance" in casting the unusual actress.[50]

Hepburn arrived in California in July 1932, at 25 years old. She starred in *A Bill of Divorcement* opposite John Barrymore, showing no sign of intimidation.[50][51] Although she struggled to adapt to the nature of film acting, Hepburn was fascinated by the industry from the start.[52] The picture was a success and Hepburn received rave reviews.[53] Mordaunt Hall of the *New York Times* called her performance "exceptionally fine ... Miss Hepburn's characterization is one of the finest seen on the screen".[54] The *Variety* review declared, "Standout here is the smash impression made by Katharine Hepburn in her first picture assignment. She has a vital something that sets her apart from the picture galaxy." [55] On the strength of *A Bill of Divorcement*, RKO signed the actress to a long-term contract.[56] George Cukor became a lifetime friend and colleagueâ ~he and Hepburn made ten films together.[57]

Hepburn's second film was *Christopher Strong* (1933), the story of an aviatrix

and her affair with a married man. The picture was not commercially successful, but Hepburn's own reviews were good.[58] Regina Crewe wrote in the *Journal American* that although her mannerisms were grating, "they compel attention, and they fascinate an audience. She is a distinct, definite, positive personality." [59] Her third picture confirmed Hepburn as a major actress in Hollywood.[60] For playing aspiring actress Eva Lovelace in *Morning Glory*, she won an Academy Award for Best Actress. She had seen the script on the desk of producer Pandro S. Berman and, convinced that she was born to play the part, insisted that the role be hers.[61] Hepburn chose not to attend the awards ceremony~as she would not for the duration of her career~but was thrilled with the win.[62] Her success continued with the role of Jo in the screen adaptation of *Little Women* (1933). The movie was a hit, one of the film industry's biggest successes to date,[50] and Hepburn won the Best Actress prize at the Venice Film Festival. *Little Women* was one of Hepburn's personal favorites and she was proud of her performance, later saying, "I defy anyone to be as good as I was [as Jo]".[60]

By the end of 1933 Hepburn was at the top of her profession, but yearned to prove herself on Broadway.[63] Jed Harris, one of the most successful theatre producers of the 1920s, was going through a career slump.[64] He asked Hepburn to appear in the play *The Lake*, which she agreed to do for a low salary.[65] Before she was given leave, RKO asked that she film *Spitfire* (1934). Hepburn's role in the movie was Trigger Hicks, an uneducated mountain girl. It is widely considered one of her worst films, and Hepburn received poor reviews for the effort.[66] Hepburn kept a picture of Hicks in her bedroom throughout her life to "[keep] me humble." [67]

The Lake previewed in Washington, D.C., where there was a large advance sale.[65] Harris's poor direction had eroded Hepburn's confidence, and she struggled with the performance.[68] Despite this, Harris moved the play to New York without further rehearsal. It opened at the Martin Beck Theatre on December 26, 1933, and Hepburn was roundly panned by the critics.[69] Dorothy Parker quipped, "Katharine Hepburn runs the gamut of emotions from A to B." [28] Already tied to a ten-week contract, she had to endure the embarrassment of rapidly declining box office sales.[70] Harris decided to take the show to Chicago, saying to Hepburn, "My dear, the only interest I have in you is the money I can make out of you." Hepburn refused, and paid Harris \$14,000 to close the production instead.[71] She later referred to Harris as "hands-down the most diabolical person I have ever met", [64] and claimed this experience was important in teaching her to take responsibility for her career.[72]

[edit] Career struggles, "box office poison" (1934~1938)

After the failure of *Spitfire* and *The Lake*, RKO cast Hepburn in *The Little Minister* (1934), based on a Victorian novel by James Barrie, in an attempt to repeat the success of *Little Women*. [73] There was no such recurrence, and the picture was a commercial failure.[74] The romantic drama *Break of Hearts* (1935) with Charles Boyer was poorly reviewed and also lost money at the box office.[75] After three forgettable movies, success returned to Hepburn with *Alice Adams* (1935), the story of a girl's desperation to climb the social ladder. Hepburn loved the book and was delighted to be offered the role.[76] The picture was a hit, one of Hepburn's personal favorites, and gave the actress her second Oscar nomination.[77]

Berman allowed Hepburn to select her next feature.[77] She chose George Cukor's new project, *Sylvia Scarlett* (1935), which paired her for the first time with Cary Grant. Her hair was cut short for the part, as her character masquerades as a boy for much of the film. Critics disliked *Sylvia Scarlett* and it was unpopular with the public.[78] For her next film she played Mary Stuart in John Ford's *Mary of Scotland* (1936). It met with a similarly poor reception.[79] *A Woman Rebels* (1937) followed, a Victorian era drama where Hepburn's character fights against convention. *Quality Street* (1937) also had a period setting, this time a comedy. Neither movie was popular with the public, which meant she had made four unsuccessful pictures in a row.[80]

Alongside a series of unpopular films, problems arose from Hepburn's

attitude.[81] She had a difficult relationship with the press, with whom she could be rude and provocative.[82] When asked if she had any children, she snapped back, "Yes I have five: two white and three colored." [83] She would not give interviews and denied requests for autographs,[84] which earned her the nickname "Katharine of Arrogance".[85] The public were also baffled by her boyish behavior and fashion choices, and she became a largely unpopular figure.[82][86] Hepburn sensed that she needed to leave Hollywood,[87] so returned east to star in a theatrical adaptation of *Jane Eyre*. It had a successful tour,[88] but uncertain about the script and unwilling to risk failure after the disaster of *The Lake*, Hepburn decided against taking the show to Broadway.[87] Towards the end of 1936, Hepburn vied for the role of Scarlett O'Hara in *Gone With The Wind*. [89] Producer David O. Selznick refused to offer her the part because he felt she had no sex appeal. He reportedly told Hepburn, "I can't see Rhett Butler chasing you for twelve years." [90]

For her next feature, *Stage Door* (1937) paired Hepburn with Ginger Rogers in a role that mirrored her own lifeâ ~that of a wealthy society girl trying to make it as an actress.[92] Hepburn was praised for her work at early previews, which gave her top billing over Rogers,[93] and the film was nominated for Best Picture at the Academy Awards. But it was not the box office hit RKO had hoped.[92] Industry pundits blamed Hepburn for the small profit, but the studio continued its commitment to resurrecting her popularity.[94] She was cast in Howard Hawks' screwball comedy *Bringing Up Baby* (1938) alongside Cary Grant. Hepburn played the physical comedy of the film with confidence,[94] and took tips on comedic timing from her co-star Walter Catlett.[95] *Bringing Up Baby* was acclaimed by critics, but it was nevertheless unsuccessful at the box office.[96] With the genre and Grant both hugely popular at the time, biographer A. Scott Berg believes the blame lay with moviegoers' rejection of Hepburn.[97]

Bringing Up Baby was the last picture Hepburn did at RKO. After its release, the Independent Theatre Owners of America included Hepburn on a list of actors considered "Box Office Poison".[97] The next film RKO offered her was *Mother Carey's Chickens*, a B movie with poor prospects.[97] Hepburn turned it down, and instead opted to buy herself out of her contract for \$75,000.[98] Many actors were afraid to leave the stability of the studio system at the time, but Hepburn's personal wealth meant she could afford to be independent.[99] She signed on for the film version of *Holiday* (1938) with Columbia Pictures, pairing her for the third time with Grant. The comedy was well received by critics, but it failed to draw much of an audience,[100] and the next script offered to Hepburn came with a salary of \$10,000â ~less than she had received at the start of her film career.[101] Reflecting on this change in fortunes, Andrew Britton writes of Hepburn, "No other star has emerged with greater rapidity or with more ecstatic acclaim. No other star, either, has become so unpopular so quickly for so long a time." [102]

[edit] Revival (1939â ~1942)

Following this decline in her career, Hepburn took action to create her own comeback vehicle. She left Hollywood to look for a stage project, and signed on to star in Philip Barry's new play, *The Philadelphia Story*. It was tailored to showcase the actress, with the character of socialite Tracy Lord incorporating a mixture of humor, aggression, nervousness, and vulnerability.[103] Howard Hughes, Hepburn's beau at the time, sensed that the play could be her ticket back to Hollywood stardom and bought her the film rights before it even debuted on stage.[104] The pair also contributed a quarter of the play's production costs.[105] *The Philadelphia Story* first toured the United States, to positive reviews, and then opened in New York at the Schubert Theatre on March 29, 1939.[106] It was a big hit, critically and financially, running for 417 performances and then going on a second successful tour.[28]

Several of the major film studios approached Hepburn to produce the movie version of Barry's play.[107] She chose to sell the rights to Metro-Goldwyn-Mayer (MGM), Hollywood's number one studio,[108] on the condition that she be the star. As part of the deal she also received the director of her

choice, George Cukor, but the co-stars she wanted, Clark Gable and Spencer Tracy, were both unavailable. Louis B. Mayer promised her James Stewart and \$150,000 "for anyone else you want or can get." [109] Hepburn chose her friend and previous co-star, Cary Grant, to whom she ceded top billing. [110] Before filming began, Hepburn shrewdly noted, "I don't want to make a grand entrance in this picture. Moviegoers ... think I'm too la-di-da or something. A lot of people want to see me fall flat on my face." Thus the film began with Grant knocking the actress flat on her backside. [111] Berg describes how the character was crafted to have audiences "laugh at her enough that they would ultimately sympathize with her", which Hepburn felt was crucial in "re-creating" her public image. [112] The Philadelphia Story was one of the biggest hits of 1940, breaking records at Radio City Music Hall. [28] The review in Time declared, "Come on back, Katie, all is forgiven." [113] Herb Golden of Variety stated, "It's Katharine Hepburn's picture ... The perfect conception of all flighty but characterful Main Line socialite gals rolled into one, the story without her is almost inconceivable." [114] Hepburn was nominated for her third Academy Award for Best Actress, and won the New York Film Critics Circle Award for Best Actress. [115] [116]

Hepburn was also responsible for the development of her next project, the romantic comedy Woman of the Year. The idea for the film was proposed to her by Garson Kanin in 1941. Hepburn passed the outline onto Joseph L. Mankiewicz at MGM, who expressed an interest in the picture. Kanin recalled how Hepburn contributed to the script: reading it, suggesting cuts and word changes, and generally providing helpful enthusiasm for the project. [117] Hepburn presented the finished product to MGM and demanded \$250,000 - half for her, half for the authors, Michael Kanin and Ring Lardner, Jr. [118] Her terms accepted, Hepburn was also given the director and co-star of her choice, George Stevens and Spencer Tracy. Released in 1942, Woman of the Year was another success. Critics praised the chemistry between the stars and, says Higham, noted Hepburn's "increasing maturity and polish". [119] The World-Telegram commended two "brilliant performances", [120] and Hepburn received a fourth Academy Award nomination for her role as independent career-woman Tess Harding. During the course of the movie, Hepburn signed a star contract with MGM. [110]

[edit] Slowing in the 1940s (1942 - 1949)

In 1942, Hepburn returned to Broadway to appear in another Philip Barry play, Without Love, which was also written with the actress in mind. [120] Critics were unenthusiastic about the production but with Hepburn's popularity at a high it ran for 16 sold-out weeks. [121] MGM were eager to reunite Tracy and Hepburn for a new picture, and settled on Keeper of the Flame (1942). A dark mystery with a propaganda message on the dangers of fascism, the film was seen by Hepburn as an opportunity to make a worthy political statement. [122] It received poor notices but was a financial success, confirming the popularity of the Tracy - Hepburn pairing. [123]

Since Woman of the Year Hepburn had committed to a romantic relationship with Tracy and dedicated herself to helping the star, who suffered from alcoholism and insomnia. [125] Her career slowed as a result, and she worked less for the remainder of the decade than she had done in the 1930s - notably by not appearing on-stage again until 1950. [126] Her only appearance in 1943 was a cameo in the morale-building wartime film Stage Door Canteen, playing herself. She took an atypical role in 1944, playing a Chinese peasant in the high-budget drama Dragon Seed. Hepburn was enthusiastic about the film, but it met with a tepid response and she was described as miscast. [127] She then reunited with Tracy for the film version of Without Love (1945), after which she turned down a role in The Razor's Edge to support Tracy through his return to Broadway. [128] Without Love received poor reviews, but a new Tracy - Hepburn picture was a big event and it was popular on release, selling a record number of tickets over Easter weekend 1945. [129]

Hepburn's next film was Undercurrent (1946), a film noir with Robert Taylor and Robert Mitchum that was poorly received. [130] A fourth film with Tracy came in 1947: a drama set in the American Old West entitled The Sea of Grass.

Similarly to *Keeper of the Flame* and *Without Love*, a lukewarm response from critics did not stop it from being a financial success both at home and abroad.[131] The same year, Hepburn portrayed Clara Wieck Schumann in *Song of Love*. She trained intensively with a pianist for the role.[132] By the time of its release in October, Hepburn's career had been significantly affected by her public opposition to the growing anti-communist witch-hunt in Hollywood. Viewed by some as dangerously progressive, she was not offered work for nine months and people reportedly threw things at screenings of *Song of Love*. [133] Her next film role came unexpectedly, as she agreed to replace Claudette Colbert only days before shooting began on Frank Capra's political drama *State of the Union* (1948).[134] Tracy had long been signed to play the male lead, and so Hepburn was already familiar with the script and stepped up for the fifth Tracy-Hepburn picture.[133] Critics responded positively to the film and it performed well at the box office.[135]

Tracy and Hepburn appeared on screen together for a third consecutive year in the 1949 film *Adam's Rib*. Like *Woman of the Year*, it was a "battle of the sexes" comedy, and was written specifically for the duo by their friends Garson Kanin and Ruth Gordon. A story of married lawyers who oppose each other in court, Hepburn described it as "perfect for [Tracy] and me".[136] She was instrumental in getting Judy Holliday cast in the film, which kick-started the young actress's Hollywood career.[137] Although Hepburn's political views still prompted scattered picketing at theatres around the country, *Adam's Rib* was a hit, favorably reviewed and the most profitable Tracy-Hepburn picture to date.[138] The *New York Times* critic Bosley Crowther was full of praise for the film and hailed the duo's "perfect compatibility".[139]

[edit] Professional expansion (1950-1952)

The 1950s saw Hepburn take on a series of professional challenges, and stretch herself further than at any other point in her life at an age when most actresses began to retreat.[140] Berg describes the decade as "the heart of her vast legacy" and "the period in which she truly came into her own." [141] In January 1950, Hepburn made her first venture into Shakespeare, playing Rosalind in *As You Like It*. She hoped to prove she could play already established material,[29] and said, "It's better to try something difficult and flop than to play it safe all the time." [142] It opened at the Cort Theatre in New York to a capacity audience, and was virtually sold out for 148 shows.[143] The production then went on tour. Reviews for Hepburn varied, but she was noted as the only leading lady in Hollywood who was performing high-caliber material on the stage.[144]

In 1951, Hepburn filmed *The African Queen*, her first movie in Technicolor. She played Rose Sayer, a prim spinster missionary living in German East Africa at the outbreak of World War I. Co-starring Humphrey Bogart, *The African Queen* was shot mostly on location in the Belgian Congo, an opportunity Hepburn embraced.[145] It proved a difficult experience, however, and Hepburn became ill with dysentery during filming.[146] Later in life, she released a memoir about the experience. The movie was released at the end of 1951 to popular support and critical acclaim,[147] and gave Hepburn her fifth Best Actress nomination at the Academy Awards. The first successful film she had made without Tracy since *The Philadelphia Story* a decade earlier, it proved that she could be a hit without him and fully reestablished her popularity.[148]

Hepburn went on to make the sports comedy *Pat and Mike* (1952), the second film written specifically as a Tracy-Hepburn vehicle by Kanin and Gordon. Hepburn was a keen athlete, and Kanin later described this as his inspiration for the film: "As I watched Kate playing tennis one day ... it occurred to me that her audience was missing a treat." [149] Hepburn was asked to gain weight for the role, and she was under pressure to perform several sports to a high standard, many of which did not end up in the film.[150] *Pat and Mike* was one of the team's most popular and critically acclaimed films, and it was also Hepburn's personal favorite of the nine films she made with Tracy.[151] The performance brought her a nomination for the Golden Globe Award for Best Actress - Motion Picture Musical or Comedy.[152]

In the summer of 1952, Hepburn appeared in London's West End for a ten-week run of George Bernard Shaw's *The Millionairess*. Her parents had read Shaw to her when she was a child, which made the play a special experience for the actress.[153] Two years of intense work had left her exhausted, however, and her friend Constance Collier wrote that Hepburn was "on the verge of a nervous breakdown".[154] Widely acclaimed, *The Millionairess* was brought to Broadway.[155] In October 1952 it opened at the Shubert Theatre, where despite a lukewarm critical response it sold out its ten-week run.[154] Hepburn subsequently tried to get the play adapted into a film: a script was written by Preston Sturges, and Hepburn offered to work for nothing and pay the director herself, but no studio picked up the project.[156] She later referred to this as the biggest disappointment of her career.[153]

[edit] *Spinsters and Shakespeare* (1953â ~1962)

Pat and Mike was the last film Hepburn completed on her MGM contract, making her free to select her own projects.[155] She spent two years resting and traveling, before committing to David Lean's romantic drama *Summertime* (1955). The movie was filmed in Venice, with Hepburn playing a lonely spinster who has a passionate love affair. She described it as "a very emotional part" and found it fascinating to work with Lean.[157] At her own insistence, Hepburn performed a fall into a canal and developed a chronic eye infection as a result.[158] The role earned her another Academy Award nomination and has been cited as some of her finest work.[159][160] Lean later said it was his personal favorite of the films he made, and Hepburn his favorite actress.[161] The following year, Hepburn spent six months touring Australia with the Old Vic theatre company, playing Portia in *The Merchant of Venice*, Kate in *The Taming of the Shrew*, and Isabella in *Measure for Measure*. The tour was successful and Hepburn earned significant plaudits for the effort.[162]

Hepburn received an Academy Award nomination for the second year running for her work opposite Burt Lancaster in *The Rainmaker* (1956). Again she played a lonely woman empowered by a love affair, and it seemed that Hepburn had found a niche in playing "love-starved spinsters" that critics, audiences, and her peers clearly enjoyed.[163] Hepburn said of playing such roles, "With Lizzie Curry [*The Rainmaker*] and Jane Hudson [*Summertime*] and Rosie Sayer [*The African Queen*]â ~I was playing me. It wasn't difficult for me to play those women, because I'm the maiden aunt." [163] Less success that year came from *The Iron Petticoat* (1956), a reworking of the classic comedy *Ninotchka*, with Bob Hope. Hepburn played a cold-hearted Soviet pilot, a performance Bosley Crowther called "horrible".[164] It was a critical and commercial failure,[164] and Hepburn considered it the worst film on her resume.[163]

Tracy and Hepburn reunited on screen for the first time in five years for the office-based comedy *Desk Set* (1957). Berg notes that it worked as a hybrid of their earlier romantic-comedy successes and Hepburn's spinster persona,[165] but it performed poorly at the box office.[166] That summer Hepburn returned to Shakespeare. Appearing in Stratford, Connecticut, at the American Shakespeare Theatre, she repeated her Portia in *The Merchant of Venice* and played Beatrice in *Much Ado About Nothing*. The shows were positively received.[165] After two years away from the screen, she starred in a film adaptation of Tennessee Williams' controversial play *Suddenly, Last Summer* (1959) with Elizabeth Taylor and Montgomery Clift. The movie was shot in London, and was "a completely miserable experience" for Hepburn.[167] She clashed with director Joseph L. Mankiewicz during filming, which culminated with her spitting at him in disgust.[168] The picture was a financial success,[169] and her work as creepy aunt Violet Venable gave Hepburn her eighth Oscar nomination. Williams was pleased with the performance, writing, "Kate is a playwright's dream actress. She makes dialogue sound better than it is by a matchless beauty and clarity of diction".[170] He wrote *The Night of the Iguana* (1961) with Hepburn in mind, but the actress, although flattered, felt the play was wrong for her and declined the part, which went to Bette Davis.[171]

Hepburn returned to Stratford in the summer of 1960 to play Viola in *Twelfth Night* and Cleopatra in *Antony and Cleopatra*. The *New York Post* wrote of her

Cleopatra, "Hepburn offers a highly versatile performance ... once or twice going in for her famous mannerisms and always being fascinating to watch." [172] Hepburn herself was proud of the role. [173] Her repertoire was further improved when she appeared in Sidney Lumet's film version of Eugene O'Neill's *Long Day's Journey Into Night* (1962). It was a low-budget production, and Hepburn appeared in the film for a tenth of her established salary. [174] She called it "the greatest [play] this country has ever produced" and the role of morphine-addicted Mary Tyrone "the most challenging female role in American drama", and felt her performance was the best screen work of her career. [175] *Long Day's Journey Into Night* earned Hepburn an Oscar nomination and the Best Actress Award at the Cannes Film Festival. It remains one of her most praised performances. [176]

[edit] Success in later years (1963â ~1970)

Following the completion of *Long Day's Journey Into Night*, Hepburn took a break in her career to care for the ailing Spencer Tracy. [177] She did not work again until 1967's *Guess Who's Coming to Dinner*, her ninth film with Tracy. The movie dealt with the subject of interracial marriage, with Hepburn's niece, Katharine Houghton, playing her daughter. Tracy was dying by this point, suffering the effects of heart disease, [178] and Houghton later commented that her aunt was "extremely tense" during the production. [179] Tracy died 17 days after filming his last scene. *Guess Who's Coming to Dinner* was a triumphant return for Hepburn and her most commercially successful picture to date. [180] She won her second Best Actress Award at the Oscars, 34 years after winning her first. Hepburn felt the award was not just for her, but was also given to honor Tracy. [180]

Hepburn quickly returned to acting after Tracy's death, choosing to preoccupy herself as a remedy against grief. [181] She received numerous scripts [182] and chose to play Eleanor of Aquitaine in *The Lion In Winter* (1968), a part she called "fascinating". [183] She read extensively in preparation for the role, [184] in which she starred opposite Peter O'Toole. Filming took place in Montmajour Abbey in the south of France, an experience she loved despite beingâ ~according to director Anthony Harveyâ ~"enormously vulnerable" throughout. [185] John Russell Taylor of *The Times* suggested that Eleanor was "the performance of her ... career", and proved that she was "a growing, developing, still surprising actress". [186] The movie was nominated in all the major categories at the Academy Awards, and for the second year running Hepburn won the Oscar for Best Actress. [187] The role, combined with her performance in *Guess Who's Coming to Dinner*, also won Hepburn a British Academy Film Award (BAFTA) for Best Actress. Hepburn's next appearance was in *The Madwoman of Chaillot* (1969), which she filmed in Nice immediately after completing *The Lion in Winter*. [188] The picture was a failure critically and financially, and reviews targeted Hepburn for giving a misguided performance. [189]

From December 1969 to August 1970, Hepburn starred in the Broadway musical *Coco*, about the life of Coco Chanel. Hepburn admitted that before the show, she had never sat through a theatrical musical. [190] She was not a strong singer, but found the offer irresistible and, as Berg puts it, "what she lacked in euphony she made up for in guts". [191] The actress took vocal lessons six times a week in preparation for the show. [191] She was nervous about every performance, and recalled "wondering what the hell I was doing there." [192] Reviews for the production were mediocre, but Hepburn herself was praised and *Coco* was popular with the public. [193] Hepburn would typically receive a standing ovation at the end of the night, and the show's run was twice extended. [194] She later said *Coco* marked the first time she accepted that the public were not against her, but actually seemed to love her. [29] Her work earned Hepburn a Tony Award nomination for Best Actress in a Musical. [195]

[edit] Film, television, and theatre (1971â ~1983)

Hepburn stayed active throughout the 1970s, focusing on roles described by Andrew Britton as "either a devouring mother or a batty old lady living [alone]". [2] First she traveled to Spain to film a version of Euripides' *The Trojan Women* (1971) alongside Vanessa Redgrave. When asked why she had taken

the role, she responded that she wanted to broaden her range and try everything while she still had time.[196] The movie was poorly received,[196] but the Kansas City Film Critics named Hepburn's performance the best from an actress that year. In 1971 she signed on to star in an adaptation of Graham Greene's *Travels With My Aunt*, but was unhappy with early versions of the script and took to rewriting it herself. The studio disliked her changes, so Hepburn abandoned the project and was replaced with Maggie Smith.[197] Her next film, an adaptation of Edward Albee's *A Delicate Balance* (1973) directed by Tony Richardson, had a small release and received generally unfavorable reviews.[198] She then ventured into television for the first time, in a production of Tennessee Williams' *The Glass Menagerie*. Hepburn had been wary of the medium but it proved to be one of the main television events of 1973, scoring high in the Nielsen ratings.[199] Hepburn received an Emmy Award nomination for playing wistful Southern mother Amanda Wingfield, which opened her mind to future work on the small screen.[200] Her next project was the television movie *Love Among the Ruins* (1975), a London-based Edwardian drama with her friend Laurence Olivier. It received positive reviews and high ratings, and earned Hepburn her only Emmy Award.[201]

Hepburn made her only appearance at the Academy Awards in 1974, to present the Irving G. Thalberg Memorial Award to Lawrence Weingarten. She received a standing ovation, and joked with the audience, "I'm very happy I didn't hear anyone call out 'It's about time'." [202] The following year, she was paired with John Wayne in the Western *Rooster Cogburn*, a sequel to his Oscar-winning film *True Grit*. Echoing her African Queen character Rose Sayer, Hepburn again played a deeply religious spinster who teams up with a masculine loner to avenge a family member's death.[198] The movie received mediocre reviews. Its casting was enough to draw some people to the box office, but it did not meet studio expectations and was only moderately successful.[203]

In 1976, Hepburn returned to Broadway for a three-month run of *A Matter of Gravity*. The role of eccentric Mrs. Basil was deemed a perfect showcase for the actress,[204] and the play was popular despite poor reviews.[205] It later went on a successful nationwide tour.[206] During its Los Angeles run, Hepburn fractured her hip. She chose to continue the tour performing in a wheelchair.[207] That year, she was voted "Favorite Motion Picture Actress" by the People's Choice Awards.[208] After three years away from the screen, Hepburn starred in the 1978 film *Olly Olly Oxen Free*. The adventure comedy was one of the biggest failures of her career~the screenwriter James Prideaux, who worked with Hepburn, later wrote that it "died at the moment of release" and referred to it as her "lost film".[209] Hepburn claimed the main reason she had done the film was the opportunity to ride in a hot air balloon.[210] The television movie *The Corn Is Green* (1979), which was filmed in Wales, followed. It was the last of ten films Hepburn made with George Cukor, and gained her a third Emmy nomination.[211]

By the 1980s Hepburn had developed a noticeable tremor, giving her a permanently shaking head. She did not work for two years, saying in a television interview, "I've had my day~let the kids scramble and sweat it out." [212] During this period she saw the Broadway production of *On Golden Pond*, and was impressed by its depiction of an elderly married couple coping with the difficulties of old age.[213] Jane Fonda had purchased the screen rights for her father, actor Henry Fonda, and Hepburn sought to play opposite him in the role of quirky Ethel Thayer.[214] *On Golden Pond* was a success, the second-highest grossing film of 1981.[215] It demonstrated how energetic the 74-year-old Hepburn was, as she dived fully clothed into Squam Lake and gave a lively singing performance.[213] The movie won her a second BAFTA and a record fourth Academy Award. Homer Dickens, in his book on Hepburn, notes that it was widely considered a sentimental win, "a tribute to her enduring career." [216]

Hepburn also returned to the stage in 1981. She received a second Tony nomination for her portrayal in *The West Side Waltz* of a septuagenarian widow with a zest for life. Variety observed that the role was "an obvious and entirely acceptable version of [Hepburn's] own public image." [217] Walter Kerr

of The New York Times wrote of Hepburn and her performance, "One mysterious thing she has learned to do is breathe unchallengeable life into lifeless lines." [218] She hoped to make a film out of the production, but nobody purchased the rights. [219] Hepburn's reputation as one of America's best loved actors was firmly established by this point, as she was named favorite movie actress in a survey by People magazine and again won the popularity award from People's Choice. [220] [221]

[edit] Focus on television (1984â ~1994)

In 1984, Hepburn starred in the dark comedy *Grace Quigley*, the story of an elderly woman who enlists a hitman (Nick Nolte) to kill her. Hepburn found humor in the morbid theme, but reviews were negative and the box office was poor. [222] In 1985, she presented a television documentary about the life and career of Spencer Tracy. [223] The majority of Hepburn's roles from this point were in television movies, which did not receive the critical praise of her earlier work in the medium but remained popular with audiences. [224] With each release, Hepburn would declare it her final screen appearance, but she continued to take on new roles. [225] She received an Emmy nomination for 1986's *Mrs. Delafield Wants to Marry*, then two years later returned for the comedy *Laura Lansing Slept Here*, which allowed Hepburn to act with her grandniece, Schuyler Grant. In 1991 she released her autobiography, *Me: Stories of my Life*. It topped best-seller lists for over a year. [226] She returned to television screens in 1992 for *The Man Upstairs*, co-starring Ryan O'Neal, for which she received a Golden Globe nomination. In 1994 she worked opposite Anthony Quinn in *This Can't Be Love*, which was largely based on Hepburn's own life, with numerous references to her personality and career. These later roles have been described as "a fictional version of the typically feisty Kate Hepburn character" and critics have remarked that Hepburn was essentially playing herself. [218] [225]

Hepburn's final appearance in a theatrically released film, and her first since *Grace Quigley* ten years earlier, was *Love Affair* (1994). At 86 years old, she played a supporting role alongside Annette Bening and Warren Beatty. It was the only film of Hepburn's career, other than the cameo appearance in *Stage Door Canteen*, in which she did not play a leading role. [227] Roger Ebert noted that it was the first time Hepburn had looked frail, but that the "magnificent spirit" was still there and said her scenes "steal the show". [228] The New York Times made similar observations as they reflected on the actress's final big-screen appearance, stating that "if she moved more slowly than before, in demeanor she was as game and modern as she had ever been". [218] Hepburn filmed one final role in the television movie *One Christmas* (1994), for which she received a Screen Actors Guild Award nomination at 87 years old. [229]

[edit] Personal life

[edit] Public image and character

"I strike people as peculiar in some way, although I don't quite understand why. Of course, I have an angular face, an angular body and, I suppose, an angular personality, which jabs into people." [218]

"I'm a personality as well as an actress. Show me an actress who isn't a personality and you'll show me a woman who isn't a star." [230]

â ~Hepburn commenting on her personality.

Hepburn was known for being fiercely private, [218] and would not give interviews or talk to fans for much of her career. [84] She distanced herself from the celebrity lifestyle, uninterested in a social scene she saw as tedious and superficial, [231] and she wore casual clothes that went strongly against convention in an era of glamour. [232] She rarely appeared in public, even avoiding restaurants, [233] and once wrestled a camera out of a photographer's

hand when he took a picture without asking.[234] Despite this she enjoyed the fame, and confessed that she would not have liked the press to ignore her completely.[235] The protective attitude thawed as she aged; beginning with a two-hour long interview on The Dick Cavett Show in 1973, Hepburn became increasingly open with the public.[236]

Hepburn's relentless energy and enthusiasm for life is often cited in biographies,[237] while a headstrong independence became key to her celebrity status.[82][218][238] This self-assuredness meant she could be controlling and difficult; her friend Garson Kanin likened her to a schoolmistress,[239] and she was famously blunt and outspoken.[232] Katharine Houghton commented that her aunt could be "maddeningly self-righteous and bossy".[240] Hepburn confessed to being, especially early in life, "a me me me person".[241] She saw herself as having a happy nature, reasoning "I like life and I've been so lucky, why shouldn't I be happy?"[177]

A. Scott Berg knew Hepburn well in her later years, and said that while she was demanding, there remained a sense of humility and humanity.[242] She led an active private life, reportedly swimming and playing tennis every morning.[149] In her eighties she was still playing tennis regularly, as indicated in her 1993 documentary All About Me.[29] She also enjoyed painting, which became a passion later in life.[243] A small bust she sculpted of Spencer Tracy's head was featured in Guess Who's Coming to Dinner.[244]

When questioned about politics, Hepburn told an interviewer, "I always just say be on the affirmative and liberal side. Don't be a 'no' person." [6] The anti-communist hysteria in 1940s Hollywood prompted her to political activity, and she made a speech against censorship in May 1947 that shocked the public.[133] Targeted by right-wing activists as a supposed communist sympathizer, she was mentioned at the hearings of the House Un-American Activities Committee.[133] She insisted that the claims made about her were untrue.[245] For decades, Hepburn openly promoted birth control and supported abortion.[29][82] She found great spirituality in existence, practicing Albert Schweitzer's theory of "Reverence for Life", [246] but did not believe in religion or the afterlife.[6] In 1991, Hepburn told a journalist, "I'm an atheist, and that's it. I believe there's nothing we can know except that we should be kind to each other and do what we can for other people." [247] Her public declarations of these beliefs led the American Humanist Association to award her the Humanist Arts Award in 1985.[248]

[edit] Relationships

Hepburn's only husband was Ludlow Ogden Smith, a socialite businessman from Philadelphia whom she met while a student at Bryn Mawr. The couple married on December 12, 1928, when she was 21 and he was 29.[249] Hepburn made Smith change his name to S. Ogden Ludlow so that she would not be known as "Kate Smith", which she considered too plain.[34] She never fully committed to the relationship and prioritized her career.[249] The move to Hollywood in 1932 cemented the couple's estrangement,[250] and in 1934, she traveled to Mexico to get a quick divorce. Hepburn often expressed her gratitude toward Smith for his financial and moral support in the early days of her career, and in her autobiography called herself "a terrible pig" for exploiting his love.[251] The pair remained friends until his death in 1979.[252]

Soon after moving to California, Hepburn began a relationship with her agent Leland Hayward. Both were married.[67] Hayward proposed to Hepburn after they had each divorced, but she did not wish to be married again.[253] She "liked the idea of being my own single self." [254] They were involved for four years.[255] In 1936, while she was touring Jane Eyre, Hepburn began a relationship with entrepreneur Howard Hughes. They first met while Hepburn was filming Sylvia Scarlett, when they were introduced by their mutual friend Cary Grant.[256] Hughes wished to marry her, and the tabloids reported their impending nuptials, but at that time Hepburn was too focused on resurrecting her failing career.[257] They separated in 1938, when Hepburn left Hollywood after being labeled "box office poison".[258]

Hepburn stuck to her decision not to remarry, and made a conscious choice not

to have children. She felt that motherhood should be a full-time commitment, and it was not one she was willing to make.[6] "I would have been a terrible mother," she told Berg, "because I'm basically a very selfish human being." [259] She felt she had partially experienced parenthood through her much younger siblings, which fulfilled any need to have children of her own.[260] Rumors have existed since the 1930s that Hepburn may have been a lesbian or bisexual.[261] In 2007, William J. Mann released a biography of the actress in which he argued this was the case.[262] In response to this speculation about her aunt, Katharine Houghton said, "I've never discovered any evidence whatsoever that she was a lesbian." [263]

[edit] Spencer Tracy

The most significant relationship of Hepburn's life was with Spencer Tracy. In her autobiography she wrote, "It was a unique feeling that I had for [Tracy]. I would have done anything for him." [264] Lauren Bacall, a close friend, later wrote of how "blindingly" in love Hepburn was with the actor.[265] The relationship has subsequently received much publicity, and it is often cited as one of Hollywood's legendary love affairs.[218][236][266] Meeting when she was 34 and he was 41, Tracy was initially wary of Hepburn, unimpressed that she had dirty fingernails and suspecting that she was a lesbian,[267] but Hepburn said she "knew right away that I found him irresistible." [268] Tracy remained married throughout their relationship; although he and his wife Louise had been living separate lives since the 1930s, there was never an official split and neither party pursued a divorce.[269] Hepburn did not interfere, and never fought for marriage.[270] With Tracy determined to conceal the relationship with Hepburn from his wife, it had to remain private.[271] They were careful not to be seen in public together, and maintained separate residences.[266][272] Tracy was a periodic alcoholic and troubled individual, whom Hepburn described as "tortured" by guilt and misery,[273] and she devoted herself to making his life easier.[274] Reports from people who saw them together describe how Hepburn's entire demeanor changed when around Tracy.[275] She mothered and obeyed him, and Tracy became heavily dependent on her.[276] They often spent stretches of time apart due to their work, particularly in the 1950s when Hepburn was largely abroad for career commitments.[277]

Tracy's health declined significantly in the 1960s, and Hepburn took a five-year break in her career to care for him.[177] She moved into Tracy's house for this period, and was with him when he died on June 10, 1967.[278] Out of consideration for Tracy's family, she did not attend his funeral.[279] It was only after Louise Tracy's death, in 1983, that Hepburn began to speak publicly about her feelings for her frequent co-star.[280] In response to the question of why she stayed with Tracy for so long, despite the nature of their relationship, she said, "I honestly don't know. I can only say that I could never have left him." [177] She claimed not to know how Tracy felt about her[281] and that they "just passed twenty-seven years [sic] together in what was to me absolute bliss." [281]

[edit] Final years and death

Hepburn stated in her eighties, "I have no fear of death. Must be wonderful, like a long sleep." [29] Her health began to deteriorate not long after her final screen appearance. In the winter of 1996 she was hospitalized with pneumonia.[282] By 1997 she had become very weak, was speaking and eating very little, and it was feared she would die.[283] She showed signs of dementia in her final years.[284] In May 2003, an aggressive tumor was found in Hepburn's neck. The decision was made not to medically intervene,[285] and she died on June 29, 2003, at the Hepburn family home in Fenwick, Connecticut. She was 96 years old and was buried in Cedar Hill Cemetery, Hartford. Hepburn requested that there be no memorial service.[286]

Hepburn's death received considerable public attention. Many tributes were held on television, and newspapers and magazines dedicated issues to the actress.[287] American president George W. Bush said Hepburn "will be remembered as one of the nation's artistic treasures." [288] In honor of her extensive theatre work, the lights of Broadway were dimmed for the evening of

July 1, 2003.[288] In 2004, in accordance with Hepburn's wishes, her belongings were put up for auction with Sotheby's in New York. The event garnered \$5.8 million, which Hepburn willed to her family.[289]
[edit] Performances: technique and analysis

"Her best films were when she was presented as a woman on her high horse with slightly pretentious, often comically stated ideas about the world. It was for men to bring her down and get her to reveal herself as quite a good gal, sporty and democratic. We liked the idea that aristocratic people would be humanized by democratic valuesâ ~in her case, by slightly rough-necked and good-natured males." [176]

â ~Film historian and critic Richard Schickel explains the typical Hepburn role and its appeal.

According to reports, Hepburn was not an instinctive actor.[290] She liked to study the text and character carefully beforehand, making sure she knew them thoroughly, and then to rehearse as much as possible and film multiple takes of a scene.[184] With a genuine passion for the industry she committed heavily to each role,[291] and insisted on learning any necessary skills and performing stunts herself.[292] She was known to learn not only her own lines but also those of her co-stars.[293] Commenting on her motivation, Stanley Kramer said, "Work, work, work. She can work till everyone drops." [294] Hepburn involved herself in the production of each of her films, making suggestions for the script and stating her opinion on everything from costumes to lighting to camerawork.[295]

The characters Hepburn played were, with very few exceptions, wealthy and intelligent, and often strong and independent.[296] These tough characters tended to be humbled in some form and revealed to have a hidden vulnerability.[297] Garson Kanin described what he called "the formula for a Hepburn success: A high-class, or stuck-up ... girl is brought down to earth by an earthy type, or a lowbrow ... or a cataclysmic situation. It seems to have worked time and time again." [298] Due to this repeated character arc, Britton sees Hepburn as embodying the "contradictions" of the "nature and status of women", [299] as the strong females she depicts are eventually "restored to a safe position within the status quo". [300] Film critic Molly Haskell has commented on the importance of this to Hepburn's career: with an intimidating presence, it was necessary that her characters "do some kind of self-abasement, to stay on the good side of the audience." [82]

Hepburn is one of America's most celebrated actresses, [301] but she has also been criticized for a lack of versatility. Her on-screen persona closely matched her own real personality, something Hepburn admitted herself. In 1991 she told a journalist, "I think I'm always the same. I had a very definite personality and I liked material that showed that personality." [266] Playwright and author David Macaray has said, "Picture Katharine Hepburn in every movie she ever starred in and ask yourself if she's not playing, essentially, the same part over and overâ ... Icon or no icon, let's not confuse a truly fascinating and unique woman with a superior actress." [302] Another repeated criticism is that her demeanor was too cold. [266]

[edit] Legacy

Hepburn is considered an important and influential cultural figure. Ros Horton and Sally Simmons included her in their book *Women Who Changed The World*, which honors 50 women who helped shape world history and culture. [303] She is also named in EncyclopÃ|dia Britannica's list of "300 Women Who Changed the World", [232] *Ladies Home Journal's* book *100 Most Important Women of the 20th century*, [304] *Variety* magazine's "100 Icons of the Century", [305] and she is number 84 on VH1's list of the "200 Greatest Pop Culture Icons of All

Time".[306] In 1999, the American Film Institute named Hepburn the "greatest American screen legend" among females.[1]

The legacy of Hepburn lies both on screen and off. Broadcaster Sheridan Morley has said she "broke the mold" for women in Hollywood,[307] where she brought a new breed of strong-willed females to the screen.[232] Film academic Andrew Britton wrote a monograph studying Hepburn's "key presence within classical Hollywood, a consistent, potentially radical disturbance",[300] and pinpoints her "central" influence in bringing feminist issues to the screen.[299] Maryann Pasda DiEdwardo has claimed that Hepburn's performances fostered a "decisiveness toward a new vision of women." [308] Off screen, Hepburn lived in a manner ahead of her time.[238] She thus came to symbolize the "modern woman" and played a part in changing attitudes towards the gender.[82][309] Horton and Simmons write, "Confident, intelligent and witty, four-time Oscar winner Katharine Hepburn defied convention throughout her professional and personal life ... Hepburn provided an image of an assertive woman whom [females] could watch and learn from." [310] After Hepburn's death, film historian Jeanine Basinger stated, "What she brought us was a new kind of heroineâ ~modern and independent. She was beautiful, but she did not rely on that." [176] Mary McNamara, an entertainment journalist and reviewer for the Los Angeles Times wrote, "More than a movie star, Katharine Hepburn was the patron saint of the independent American female." [82] She was not universally revered by feminists, however, who were angered by her public declarations that women "cannot have it all", meaning a family and a career.[82]

Hepburn's legacy extends to fashion, where she was a pioneer for wearing trousers at a time when it was radical for a woman to do so.[311] She contributed towards making trousers acceptable for women, as fans began to imitate her clothing.[218][312] In 1986 she received a lifetime achievement award from the Council of Fashion Designers of America in recognition of the influence she played in women's fashion.[218]

A number of Hepburn's films have become classics of American cinema, with four of her pictures (The African Queen, The Philadelphia Story, Bringing Up Baby, and Guess Who's Coming to Dinner) featuring on the American Film Institute's list of the 100 Greatest American Films of all time.[313] Adam's Rib and Woman of the Year were included in the AFI's list of the Greatest American Comedies.[314] Her clipped, patrician voice is considered one of the most distinctive in film history.[176] [Â Sample, from Stage Door (1937)Â (helpÂ·info)] [edit] Memorials

Hepburn has been honored with several memorials. The Turtle Bay community in Manhattan, New York City, where she maintained a residence for over 60 years, dedicated a garden in her name in 1997.[315] After Hepburn's death in 2003, the intersection of East 49th Street and 2nd Avenue was renamed "Katharine Hepburn Place".[316] Three years later Bryn Mawr College, Hepburn's alma mater, launched the Katharine Houghton Hepburn Center. It is dedicated to both the actress and her mother, and encourages women to address important issues affecting their gender. The center awards the annual Katharine Hepburn Medal, which "recognizes women whose lives, work and contributions embody the intelligence, drive and independence of the four-time-Oscar-winning actress".[317] The Katharine Hepburn Cultural Arts Center was opened in 2009 in Old Saybrook, Connecticut, the location of the Hepburn family beach home which she loved and later owned.[318] The building includes a performance space and a Katharine Hepburn museum.[319]

The Academy of Motion Picture Arts and Sciences library[320] and the New York Public Library hold collections of Hepburn's personal papers. Selections from the New York collection, which documents Hepburn's theatrical career, were presented in a five-month exhibition, Katharine Hepburn: In Her Own Files, in 2009.[321] Other exhibitions have been held to showcase Hepburn's career. One Life: Kate, A Centennial Celebration was held at the National Portrait Gallery in Washington from November 2007 to September 2008.[322] Kent State University exhibited a selection of Hepburn's film and theatre costumes from October 2010 to September 2011 in Katharine Hepburn: Dressed for Stage and Screen.[323]

Hepburn has also been honored with her own postal stamp as part of the "Legends of Hollywood" stamp series.[324]

[edit] Characterizations

Hepburn is the subject of a one-woman play, *Tea at Five*, written by Matthew Lombardo. The first act features Hepburn in 1938, after being labeled "box office poison", and the second act in 1983, where she reflects on her life and career.[325] It was first performed in 2002 at the Hartford Stage.[326] Hepburn has been portrayed in *Tea at Five* by Kate Mulgrew,[325]Tovah Feldshuh,[327]Stephanie Zimbalist,[328] and Charles Busch.[329] Feldshuh also appeared as Hepburn in *The Amazing Howard Hughes*, a 1977 television movie. Mearle Ann Taylor portrayed her in *The Scarlett O'Hara War* (1980). In Martin Scorsese's 2004 biopic of Howard Hughes, *The Aviator*, Hepburn was portrayed by Cate Blanchett, who won the Academy Award for Best Supporting Actress for her performance. This marked the first instance where the portrayal of an Academy Award-winning actress was turned into an Academy Award-winning role.[330]

[edit] Awards and nominations

Hepburn won four Academy Awards, the record number for a performer, and a total of 12 Oscar nominations for Best Actressâ ~a number surpassed only by Meryl Streep.[331] Hepburn also holds the record for the longest time span between first and last Oscar nominations, at 48 years.[331] She received two awards and five nominations from the British Academy Film Awards, one award and six nominations from the Emmy Awards, eight Golden Globe nominations, two Tony Award nominations, and awards from the Cannes Film Festival, Venice Film Festival, the New York Film Critics Circle Awards, the People's Choice Awards, and others. She won a Lifetime Achievement Award from the Screen Actors Guild in 1979 and received the Kennedy Center Honors, which recognize a lifetime of accomplishments in the arts, in 1990.[332][333]

Hepburn was recognized by the Academy of Motion Picture Arts and Sciences for the following performances:

6th Academy Awards (1934): Best Actress, win, for *Morning Glory*
8th Academy Awards (1936): Best Actress, nomination, for *Alice Adams*
13th Academy Awards (1941): Best Actress, nomination, for *The Philadelphia Story*
15th Academy Awards (1943): Best Actress, nomination, for *Woman of the Year*
24th Academy Awards (1952): Best Actress, nomination, for *The African Queen*
28th Academy Awards (1956): Best Actress, nomination, for *Summertime*
29th Academy Awards (1957): Best Actress, nomination, for *The Rainmaker*
32nd Academy Awards (1960): Best Actress, nomination, for *Suddenly, Last Summer*
35th Academy Awards (1963): Best Actress, nomination, for *Long Day's Journey into Night*

40th Academy Awards (1968): Best Actress, win, for *Guess Who's Coming to Dinner*
41st Academy Awards (1969): Best Actress, win, for *The Lion in Winter* (shared with Barbra Streisand for *Funny Girl*)

54th Academy Awards (1982): Best Actress, win, for *On Golden Pond*

[edit] Filmography and theatre credits

During her 66-year career, Hepburn appeared in 44 feature films, 8 television movies, and 33 plays. Her movie career covered a range of genres, including screwball comedies, period dramas, and adaptations of works by America's top playwrights. She appeared on the stage in every decade from the 1920s to the 1980s, performing plays by Shakespeare and Shaw, and a Broadway musical.[334][335]

Select filmography:

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^a ^b "AFI's 100 Years...100 Stars". American Film Institute. June 16, 1999. <http://www.afi.com/100years/stars.aspx>. Retrieved October 17, 2009.

^a ^b Britton (2003) p. 41.

^a Berg (2004), p. 40.

^a Chandler (2011) p. 37.

^a Higham (2004) p. 2.

^a ^b ^c ^d "Katharine Hepburn: Part 2". The Dick Cavett Show. October 3, 1973.

American Broadcasting Company. Stated by Hepburn in this interview.

^ Higham (2004) p. 4; Chandler (2011) p. 39; Prideaux (1996) p. 74.

^ Hepburn (1991) p. 21.

^ "Katharine Hepburn: Part 1". The Dick Cavett Show. October 2, 1973. American Broadcasting Company. Hepburn described herself as "enormously lucky" in this interview when talking about her background. When asked if this was the reason for her success, she responded: "Well, I think that in the first place, it's lucky if you have an intelligent, and brilliant, and inspiring father and mother, and it's lucky if you had experiences before the age of 15 which teach you not to be afraid."

^ Berg (2004) p. 47, writes that Hepburn called her family "the great advantage she had had in her life and her career" and that it gave her "a leg up".

^ Hepburn (1991) p. 30; Kanin (1971) p. 82.

^ Chandler (2011) p. 30.

^ Hepburn (1991) p. 43.; Higham (2004) p. 2.

^ a b Higham (2004) p. 7.

^ Higham (2004) p. 3.

^ Chandler (2011) p. 34.

^ Higham (2004) p. 4.

^ Hepburn (1991) p. 44.

^ Hepburn (1991) p. 46.

^ Chandler (2011) p. 6.

^ Higham (2004) p. 5.

^ Hepburn (1991) p. 49.

^ Chandler (2011) p. 7.

^ Kanin (1971) p. 285.

^ Hepburn (1991) p. 69.

^ a b Dickens (1990) p. 4.

^ Horton and Simmons (2007) p. 119.

^ a b c d e "Cinema: The Hepburn Story". Time. September 1, 1952.

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^ Higham (2004) p. 8.

^ Hepburn (1991) p.81.

^ a b c Higham (2004) p. 9.

^ Berg (2004) p. 59; Higham (2004) p. 9.

^ a b Berg (2004) p. 73.

^ Hepburn (1991) p. 109.

^ Higham (2004) p. 11.

^ Higham (2004) p. 16; Hepburn (1991) p. 112.

^ a b Higham (2004) p. 16.

^ Kanin (1971) p. 22.

^ a b Hepburn (1991) p. 118.

^ Berg (2004) p. 74.

^ Hepburn (1991) p. 120.

^ Higham (2004) p. 17.

^ Berg (2004) p. 75.

^ Dickens (1990) p. 229.

^ Hepburn (1991) p. 128.

^ Higham (2004) p. 23.

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[edit] External links

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Akeley, Mary JobeMary Jobe Akeley

Albers, AnniAnni Albers

Anderson, MarianMarian Anderson

Auerbach, Beatrice FoxBeatrice Fox Auerbach

Baker, Emma FieldingEmma Fielding Baker

Batchelder, Evelyn LongmanEvelyn Longman Batchelder

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Day, Katharine SeymourKatharine Seymour Day

Fielding, Fidelia HoscottFidelia Hoscott Fielding

Gilman, Charlotte PerkinsCharlotte Perkins Gilman

Goodwin, DorothyDorothy Goodwin
Grasso, Ella TambussiElla Tambussi Grasso
Griswold, EstelleEstelle Griswold
Hall, MaryMary Hall
Hamilton, AliceAlice Hamilton
Hepburn, KatharineKatharine Hepburn
Hepburn, Katharine Martha HoughtonKatharine Martha Houghton Hepburn
Hooker, Isabella BeecherIsabella Beecher Hooker
Jones, Emeline RobertsEmeline Roberts Jones
Kennelly, BarbaraBarbara Kennelly
Luce, Clare BootheClare Boothe Luce
Milton, Rachel TaylorRachel Taylor Milton
Paul, AliceAlice Paul
Peters, Ellen AshEllen Ash Peters
Petry, AnnAnn Petry
Porter, SarahSarah Porter
Riddle, Theodate PopeTheodate Pope Riddle
Rosario, Edna NegronEdna Negron Rosario
Rudkin, Margaret FogartyMargaret Fogarty Rudkin
Saint James, SusanSusan Saint James
Sigourney, Lydia HuntleyLydia Huntley Sigourney
Smith, Virginia ThrallVirginia Thrall Smith
Smiths of Glastonbury, TheThe Smiths of Glastonbury
Standish, Hilda CrosbyHilda Crosby Standish
Stowe, Harriet BeecherHarriet Beecher Stowe
Tantaquidgeon, GladysGladys Tantaquidgeon
Tianti, BettyBetty Tianti
Watson, Hannah BunceHannah Bunce Watson
Woodhouse, Chase GoingChase Going Woodhouse

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Persondata

Name

Hepburn, Katharine Houghton

Alternative names

Short description

Actor

Date of birth

1907-05-12

Place of birth

Hartford, Connecticut, United States

Date of death

2003-06-29

Place of death

Fenwick, Old Saybrook, Connecticut, United States

Sir Edward William Elgar, 1st Baronet, OM, GCVO (2 June 1857 â ^ 23 February 1934) was an English composer, many of whose works have entered the British and international classical concert repertoire. Among his best-known compositions are orchestral works including the Enigma Variations, the Pomp and Circumstance Marches, concertos for violin and cello, and two symphonies. He also composed choral works, including The Dream of Gerontius, chamber music and songs. He was appointed Master of the King's Musick in 1924.

Although Elgar is often regarded as a typically English composer, most of his musical influences were not from England but from continental Europe. He felt himself to be an outsider, not only musically, but socially. In musical circles dominated by academics, he was a self-taught composer; in Protestant Britain, his Catholicism was regarded with suspicion in some quarters; and in the class-conscious society of Victorian and Edwardian Britain, he was acutely sensitive about his humble origins even after he achieved recognition. He nevertheless married the daughter of a senior British army officer. She inspired him both musically and socially, but he struggled to achieve success until his forties, when after a series of moderately successful works his Enigma Variations (1899) became immediately popular in Britain and overseas. He followed the Variations with a choral work, The Dream of Gerontius (1900), based on a Catholic text that caused some disquiet in the Anglican establishment in Britain, but it became, and has remained, a core repertory work in Britain and elsewhere. His later full-length religious choral works were well received but have not entered the regular repertory. The first of his Pomp and Circumstance Marches (1901) is well known in the English-speaking world.

In his fifties, Elgar composed a symphony and a violin concerto that were immensely successful. His second symphony and his cello concerto did not gain immediate public popularity and took many years to achieve a regular place in the concert repertory of British orchestras. Elgar's music came, in his later years, to be seen as appealing chiefly to British audiences. His stock remained low for a generation after his death. It began to revive significantly in the 1960s, helped by new recordings of his works. Some of his works have, in recent years, been taken up again internationally, but the music remains more played in Britain than elsewhere.

Elgar has been described as the first composer to take the gramophone seriously. Between 1914 and 1925, he conducted a series of acoustic recordings of his works. The introduction of the microphone in 1925 made far more accurate sound reproduction possible, and Elgar made new recordings of most of his major orchestral works and excerpts from The Dream of Gerontius.

Biography

Early years

Edward Elgar was born in the small village of Lower Broadheath, outside Worcester, England. His father, William Henry Elgar (1821â ^1906), was raised in Dover and had been apprenticed to a London music publisher. In 1841 William moved to Worcester, where he worked as a piano tuner and set up a shop selling sheet music and musical instruments.[1] In 1848 he married Ann Greening (1822â ^1902), daughter of a farm worker.[2] Edward was the fourth of their seven children.[n 1] Ann Elgar had converted to Catholicism shortly before Edward's birth, and he was baptised and brought up as a Catholic, to the disapproval of his father.[n 2] William Elgar was a violinist of professional standard and held the post of organist of St. George's Catholic Church, Worcester, from 1846 to 1885. At his instigation, masses by Cherubini and Hummel were first heard at the Three Choirs Festival by the orchestra in which he played the violin.[5] All the Elgar children received a musical upbringing. By the age of eight, Elgar was taking piano and violin lessons, and his father, who tuned the pianos at many grand houses in Worcestershire, would sometimes take him along, giving him the chance to display his skill to important local figures.[1]

Elgar's mother was interested in the arts and encouraged his musical development.[2] He inherited from her a discerning taste for literature and a passionate love of the countryside.[6] His friend and biographer W. H. "Billy"

Reed wrote that Elgar's early surroundings had an influence that "permeated all his work and gave to his whole life that subtle but none the less true and sturdy English quality." [7] [n 3] He began composing at an early age; for a play written and acted by the Elgar children when he was about ten, he wrote music that forty years later he rearranged with only minor changes and orchestrated as the suites titled *The Wand of Youth*. [2]

Until he was fifteen, Elgar received a general education at Littleton (now Lyttleton) [n 4] House school, near Worcester. However, his only formal musical training beyond piano and violin lessons from local teachers was more advanced violin studies with Adolf Pollitzer, during brief visits to London in 1877â ^78. Elgar said "my first music was learnt in the Cathedral ... from books borrowed from the music library, when I was eight, nine or ten." [10] He worked through manuals of instruction on organ playing and read every book he could find on the theory of music. [5] He later said that he had been most helped by Hubert Parry's articles in the *Grove Dictionary of Music and Musicians*. [11] Elgar began to learn German, in the hope of going to the Leipzig Conservatory for further musical studies, but his father could not afford to send him. Years later a profile in *The Musical Times* considered that his failure to get to Leipzig was fortunate for Elgar's musical development: "Thus the budding composer escaped the dogmatism of the schools." [5] However, it was a disappointment to Elgar that on leaving school in 1872 he went not to Leipzig but to the office of a local solicitor as a clerk. He did not find an office career congenial, and for fulfilment he turned not only to music but to literature, becoming a voracious reader. [n 5] Around this time, he made his first public appearances as a violinist and organist. [13]

After a few months, Elgar left the solicitor to embark on a musical career, giving piano and violin lessons and working occasionally in his father's shop. [1] He was an active member of the Worcester Glee Club, along with his father, and he accompanied singers, played the violin, composed and arranged works, and conducted for the first time. Pollitzer believed that, as a violinist, Elgar had the potential to be one of the leading soloists in the country, [14] but Elgar himself, having heard leading virtuosos at London concerts, felt his own violin playing lacked a full enough tone, and he abandoned his ambitions to be a soloist. [1] At twenty-two he took up the post of conductor of the attendants' band at the Worcester and County Lunatic Asylum in Powick, three miles (5Â km) from Worcester. [5] The band consisted of: piccolo, flute, clarinet, two cornets, euphonium, three or four first and a similar number of second violins, occasional viola, cello, double bass and piano. [15] Elgar coached the players and wrote and arranged their music, including quadrilles and polkas, for the unusual combination of instruments. *The Musical Times* wrote, "This practical experience proved to be of the greatest value to the young musician. ... He acquired a practical knowledge of the capabilities of these different instruments. ... He thereby got to know intimately the tone colour, the ins and outs of these and many other instruments." [5] He held the post for five years, from 1879, travelling to Powick once a week. [1] Another post he held in his early days was professor of the violin at the Worcester College for the Blind Sons of Gentlemen. [5]

Although rather solitary and introspective by nature, Elgar thrived in Worcester's musical circles. [2] He played in the violins at the Worcester and Birmingham Festivals, and one great experience was to play Dvořák's *Symphony No. 6* and *Stabat Mater* under the composer's baton. [16] Elgar regularly played the bassoon in a wind quintet, alongside his brother Frank, an oboist (and conductor who ran his own wind band). [5] Elgar arranged numerous pieces by Mozart, Beethoven, Haydn, and others for the quintet, honing his arranging and compositional skills. [5]

In his first trips abroad, Elgar visited Paris in 1880 and Leipzig in 1882. He heard Saint-Saëns play the organ at the Madeleine and attended concerts by first-rate orchestras. In 1882 he wrote, "I got pretty well dosed with Schumann (my ideal!), Brahms, Rubinstein & Wagner, so had no cause to complain." [10] In Leipzig he visited a friend, Helen Weaver, who was a student at the

Conservatoire. They became engaged in the summer of 1883, but for unknown reasons the engagement was broken off the next year.[1] Elgar was greatly distressed, and some of his later cryptic dedications of romantic music may have alluded to Helen and his feelings for her.[n 6] Throughout his life, Elgar was often inspired by close women friends; Helen Weaver was succeeded by Mary Lygon, Dora Penny, Julia Worthington, Alice Stuart Wortley and finally Vera Hockman, who enlivened his old age.[17]

In 1883, while a regular member of the orchestra for W. C. Stockley's winter concert seasons in Birmingham, Elgar took part in a performance of one of his first works for full orchestra, the *SÃ©rÃ©nade mauresque*. Stockley had invited him to conduct the piece, but, as Stockley later recalled, "he declined, and, further, insisted upon playing in his place in the orchestra. The consequence was that he had to appear, fiddle in hand, to acknowledge the genuine and hearty applause of the audience." [18] He often went to London in an attempt to get his works published, but this period in his life found him frequently despondent and low on money. He wrote to a friend in April 1884, "My prospects are about as hopeless as ever ... I am not wanting in energy I think, so sometimes I conclude that 'tis want of ability. ... I have no money â ^ not a cent." [19] For a number of years he was assistant to his father, William Elgar, as organist of St George's Catholic Church, Worcester, and succeeded him for four years from 1885. During this period he wrote his first liturgical works in the Catholic tradition, beginning with his three motets Op. 2 (1887) for four-part choir (*Ave Verum Corpus*, *Ave Maria* and *Ave Maris Stella*), and followed by a setting of *Ecce sacerdos magnus* for the entry of the Bishop on an official visit to St. George's in 1888, all four of which remain in the repertoire of church choirs.

Marriage

When Elgar was twenty-nine, he took on a new pupil, Caroline Alice Roberts, daughter of the late Major-General Sir Henry Roberts, and a published author of verse and prose fiction. Eight years older than Elgar, Alice became his wife three years later. Elgar's biographer Michael Kennedy writes, "Alice's family was horrified by her intention to marry an unknown musician who worked in a shop and was a Catholic. She was disinherited." [1] They were married on 8 May 1889, at Brompton Oratory.[16] From then until her death she acted as his business manager and social secretary, dealt with his mood swings and was a perceptive musical critic.[20][21] She did her best to gain him the attention of influential society, though with limited success.[22] In time he would learn to accept the honours given him, realising that they mattered more to her and her social class and recognising what she had given up to further his career.[n 7] In her diary she wrote, "The care of a genius is enough of a life work for any woman." [24] As an engagement present, Elgar dedicated his short violin and piano piece *Salut d'Amour* to her.[n 8] With Alice's encouragement, the Elgars moved to London to be closer to the centre of British musical life, and Elgar started devoting his time to composition. Their only child, Carice Irene, was born at their home in West Kensington on 14 August 1890. Her name, revealed in Elgar's dedication of *Salut d'Amour*, was a contraction of her mother's names Caroline and Alice.

Elgar took full advantage of the opportunity to hear unfamiliar music. In the days before miniature scores and recordings were available, it was not easy for young composers to get to know new music.[25] Elgar took every chance to do so at the Crystal Palace concerts. He and Alice attended day after day, hearing music by a wide range of composers. Among these were masters of orchestration from whom he learned much, such as Berlioz and Wagner.[2] His own compositions, however, made little impact on London's musical scene. August Manns conducted Elgar's orchestral version of *Salut d'amour* and the *Suite in D* at the Crystal Palace, and two publishers accepted some of Elgar's violin pieces, organ voluntaries, and partsongs.[26] Some tantalising opportunities seemed to be within reach but vanished unexpectedly.[26] For example, an offer from the Royal Opera House, Covent Garden, to run through some of his works was withdrawn at the last second when Sir Arthur Sullivan arrived unannounced to

rehearse some of his own music. Sullivan was horrified when Elgar later told him what had happened.[n 9] Elgar's only important commission while in London came from his home city: the Worcester Festival Committee invited him to compose a short orchestral work for the 1890 Three Choirs Festival.[28] The result is described by Diana McVeagh in the Grove Dictionary of Music and Musicians, as "his first major work, the assured and uninhibited Froissart." Elgar conducted the first performance in Worcester in September 1890.[2] For lack of other work, he was obliged to leave London in 1891 and return with his wife and child to Worcestershire, where he could earn a living conducting local musical ensembles and teaching. They settled in Alice's former home town, Great Malvern.[2]

Growing reputation

During the 1890s, Elgar gradually built up a reputation as a composer, chiefly of works for the great choral festivals of the English Midlands. The Black Knight (1892) and King Olaf (1896), both inspired by Longfellow, The Light of Life (1896) and Caractacus (1898) were all modestly successful, and he obtained a long-standing publisher in Novello and Co.[29] Other works of this decade included the Serenade for Strings (1892) and Three Bavarian Dances (1897). Elgar was of enough consequence locally to recommend the young composer Samuel Coleridge-Taylor to the Three Choirs Festival for a concert piece, which helped establish the younger man's career.[n 10] Elgar was catching the attention of prominent critics, but their reviews were polite rather than enthusiastic. Although he was in demand as a festival composer, he was only just getting by financially and felt unappreciated. In 1898, he said he was "very sick at heart over music" and hoped to find a way to succeed with a larger work. His friend August Jaeger tried to lift his spirits: "A day's attack of the blues ... will not drive away your desire, your necessity, which is to exercise those creative faculties which a kind providence has given you. Your time of universal recognition will come."[31]

In 1899, that prediction suddenly came true. At the age of forty-two, Elgar produced the Enigma Variations, which were premiered in London under the baton of the eminent German conductor Hans Richter. In Elgar's own words, "I have sketched a set of Variations on an original theme. The Variations have amused me because I've labelled them with the nicknames of my particular friends ... that is to say I've written the variations each one to represent the mood of the 'party' (the person) ... and have written what I think they would have written â ^ if they were asses enough to compose".[32] He dedicated the work "To my friends pictured within". Probably the best known variation is "Nimrod", depicting Jaeger. Purely musical considerations led Elgar to omit variations depicting Arthur Sullivan and Hubert Parry, whose styles he tried but failed to incorporate in the variations.[33] The large-scale work was received with general acclaim for its originality, charm and craftsmanship, and it established Elgar as the pre-eminent British composer of his generation.[2]

The work is formally titled Variations on an Original Theme; the word "Enigma" appears over the first six bars of music, which led to the familiar version of the title. The enigma is that, although there are fourteen variations on the "original theme", there is another overarching theme, never identified by Elgar, which he said "runs through and over the whole set" but is never heard.[n 11] Later commentators have observed that although Elgar is today regarded as a characteristically English composer, his orchestral music and this work in particular share much with the Central European tradition typified at the time by the work of Richard Strauss.[1][2] The Enigma Variations were well received in Germany and Italy,[35] and remain to the present day a worldwide concert staple.[n 12]

National and international fame

Elgar's biographer Basil Maine commented, "When Sir Arthur Sullivan died in 1900 it became apparent to many that Elgar, although a composer of another build, was his true successor as first musician of the land."[16] Elgar's next major work was eagerly awaited.[36] For the Birmingham Triennial Music Festival of 1900, he set Cardinal John Henry Newman's poem The Dream of Gerontius for

soloists, chorus and orchestra. Richter conducted the premiere, which was marred by a poorly prepared chorus, which sang badly.[37] Elgar was deeply depressed, but the critics recognised the mastery of the piece despite the defects in performance.[1] It was performed in Düsseldorf, Germany, in 1901 and again in 1902, conducted by Julius Butts, who also conducted the European premiere of the Enigma Variations in 1901. The German press was enthusiastic. The Cologne Gazette said, "In both parts we meet with beauties of imperishable value. ... Elgar stands on the shoulders of Berlioz, Wagner, and Liszt, from whose influences he has freed himself until he has become an important individuality. He is one of the leaders of musical art of modern times." The Düsseldorf Volksblatt wrote, "A memorable and epoch-making first performance! Since the days of Liszt nothing has been produced in the way of oratorio ... which reaches the greatness and importance of this sacred cantata." [38] Richard Strauss, then widely viewed as the leading composer of his day,[39] was so impressed that in Elgar's presence he proposed a toast to the success of "the first English progressive musician, Meister Elgar." [39][n 13] Performances in Vienna, Paris and New York followed,[2][41] and The Dream of Gerontius soon became equally admired in Britain. According to Kennedy, "It is unquestionably the greatest British work in the oratorio form ... [it] opened a new chapter in the English choral tradition and liberated it from its Handelian preoccupation." [1] Elgar, as a Catholic, was much moved by Newman's poem about the death and redemption of a sinner, but some influential members of the Anglican establishment disagreed. His colleague, Charles Villiers Stanford complained that the work "stinks of incense".[42] The Dean of Gloucester banned Gerontius from his cathedral in 1901, and at Worcester the following year, the Dean insisted on expurgations before allowing a performance.[43]

Elgar is probably best known for the first of the five Pomp and Circumstance Marches, which were composed between 1901 and 1930.[44] It is familiar to millions of television viewers all over the world every year who watch the Last Night of the Proms,[45] where it is traditionally performed. When the theme of the slower middle section (technically called the "trio") of the first march came into his head, he told his friend Dora Penny, "I've got a tune that will knock 'em flat".[46] When the first march was played in 1901 at a London Promenade Concert, it was conducted by Henry J. Wood, who later wrote that the audience "rose and yelled ... the one and only time in the history of the Promenade concerts that an orchestral item was accorded a double encore." [47] To mark the coronation of Edward VII, Elgar was commissioned to set A. C. Benson's Coronation Ode for a gala concert at the Royal Opera House in June 1901. The approval of the king was confirmed, and Elgar began work. The contralto Clara Butt had persuaded him that the trio of the first Pomp and Circumstance march could have words fitted to it, and Elgar invited Benson to do so. Elgar incorporated the new vocal version into the Ode. The publishers of the score recognised the potential of the vocal piece, "Land of Hope and Glory", and asked Benson and Elgar to make a further revision for publication as a separate song.[48] It was immensely popular and is now considered an unofficial British national anthem.[1] In the United States, the trio, known simply as "Pomp and Circumstance" or "The Graduation March", has been adopted since 1905 for virtually all high school and university graduations.[49][50]

In March 1904 a three-day festival of Elgar's works was presented at Covent Garden, an honour never before given to any English composer. The Times commented, "Four or five years ago if any one had predicted that the Opera-house would be full from floor to ceiling for the performance of an oratorio by an English composer he would probably have been supposed to be out of his mind." [51] The king and queen attended the first concert, at which Richter conducted The Dream of Gerontius,[51] and returned the next evening for the second, the London premiere of The Apostles (first heard the previous year at the Birmingham Festival).[52] The final concert of the festival, conducted by Elgar, was primarily orchestral, apart for an excerpt from Caractacus and the complete Sea Pictures (sung by Clara Butt). The orchestral items were Froissart, the Enigma Variations, Cockaigne, the first two (at that time the

only two) Pomp and Circumstance marches, and the premiere of a new orchestral work, *In the South* (Alassio), inspired by a holiday in Italy.[53]

Elgar was knighted at Buckingham Palace on 5 July 1904.[54] The following month, he and his family moved to Plas Gwyn,[55] a large house on the outskirts of Hereford, overlooking the River Wye, where they lived until 1911.[1] Between 1902 and 1914, Elgar was, in Kennedy's words, at the zenith of popularity.[1] He made four visits to the U.S., including one conducting tour, and earned considerable fees from the performance of his music. Between 1905 and 1908, he held the post of Peyton Professor of Music at the University of Birmingham.[2] He had accepted the post reluctantly, feeling that a composer should not head a school of music.[56] He was not at ease in the role,[57] and his lectures caused controversy, with his attacks on the critics[58][n 14] and on English music in general: "Vulgarity in the course of time may be refined. Vulgarity often goes with inventiveness ... but the commonplace mind can never be anything but commonplace. An Englishman will take you into a large room, beautifully proportioned, and will point out to you that it is white â ^ all over white â ^ and somebody will say, 'What exquisite taste'. You know in your own mind, in your own soul, that it is not taste at all, that it is the want of taste, that is mere evasion. English music is white, and evades everything." He regretted the controversy and was glad to hand on the post to his friend Granville Bantock in 1908.[61] His new life as a celebrity was a mixed blessing to the highly strung Elgar, as it interrupted his privacy, and he often was in ill-health. He complained to Jaeger in 1903, "My life is one continual giving up of little things which I love." [62] Both W. S. Gilbert and Thomas Hardy sought to collaborate with Elgar in this decade. Elgar refused, but would have collaborated with George Bernard Shaw had Shaw been willing.[63]

Elgar's principal composition in 1905 was the *Introduction and Allegro* for Strings, dedicated to Samuel Sanford, professor at Yale University. Elgar visited America in that year to conduct his music and to accept a doctorate from Yale.[2][n 15] His next large-scale work was the sequel to *The Apostles* â ^ the oratorio *The Kingdom* (1906). It was well received but did not catch the public imagination as *The Dream of Gerontius* had done and continued to do. Among keen Elgarians, however, *The Kingdom* was sometimes preferred to the earlier work: Elgar's friend Frank Schuster told the young Adrian Boult: "compared with *The Kingdom*, *Gerontius* is the work of a raw amateur." [64] As Elgar approached his fiftieth birthday, he began work on his first symphony, a project that had been in his mind in various forms for nearly ten years.[65] His *First Symphony* (1908) was a national and international triumph. Within weeks of the premiere it was performed in New York under Walter Damrosch, Vienna under Ferdinand L  we, St. Petersburg under Alexander Siloti, and Leipzig under Arthur Nikisch. There were performances in Rome, Chicago, Boston, Toronto and fifteen British towns and cities. In just over a year, it received a hundred performances in Britain, America and continental Europe.[66]

The *Violin Concerto* (1910) was commissioned by Fritz Kreisler, one of the leading international violinists of the time. Elgar wrote it during the summer of 1910, with occasional help from the violinist W. H. Reed, the leader of the London Symphony Orchestra, who helped the composer with advice on technical points. Elgar and Reed formed a firm friendship, which lasted for the rest of Elgar's life. Reed's biography, *Elgar As I Knew Him* (1936), records many details of Elgar's methods of composition.[67] The work was presented by the Royal Philharmonic Society, with Kreisler and the London Symphony Orchestra (LSO), conducted by the composer. Reed recalled, "the Concerto proved to be a complete triumph, the concert a brilliant and unforgettable occasion".[68] So great was the impact of the concerto that Kreisler's rival Eug  ne Ysa  e spent much time with Elgar going through the work. There was great disappointment when contractual difficulties prevented Ysa  e from playing it in London.[68]

The *Violin Concerto* was Elgar's last popular triumph. The following year he presented his *Second Symphony* in London, but was disappointed at its reception. Unlike the *First Symphony*, it ends not in a blaze of orchestral splendour but quietly and contemplatively. Reed, who played at the premiere, later wrote that

Elgar was recalled to the platform several times to acknowledge the applause, "but missed that unmistakable note perceived when an audience, even an English audience, is thoroughly roused or worked up, as it was after the Violin Concerto or the First Symphony." [69] Elgar asked Reed, "What is the matter with them, Billy? They sit there like a lot of stuffed pigs." [69] The work was, by normal standards, a success, with twenty-seven performances within three years of its premiere, but it did not achieve the international furore of the First Symphony. [70]

Last major works

In June 1911, as part of the celebrations surrounding the coronation of King George V, Elgar was appointed to the Order of Merit, [71] an exclusive honour limited to twenty-four holders at any time. The following year, the Elgars moved back to London, to a large house in Netherhall Gardens, Hampstead, designed by Norman Shaw. There Elgar composed his last two large-scale works of the pre-war era, the choral ode, *The Music Makers* (for the Birmingham Festival, 1912) and the symphonic study *Falstaff* (for the Leeds Festival, 1913). Both were received politely but without enthusiasm. Even the dedicatee of *Falstaff*, the conductor Landon Ronald, confessed privately that he could not "make head or tail of the piece," [72] while the musical scholar Percy Scholes wrote of *Falstaff* that it was a "great work" but, "so far as public appreciation goes, a comparative failure." [73]

When World War I broke out, Elgar was horrified at the prospect of the carnage, but his patriotic feelings were nonetheless aroused. [74] He composed "A Song for Soldiers", which he later withdrew. He signed up as a special constable in the local police and later joined the Hampstead Volunteer Reserve of the army. [75] He composed patriotic works, *Carillon*, a recitation for speaker and orchestra in honour of Belgium, [76] and *Polonia*, an orchestral piece in honour of Poland. [77] *Land of Hope and Glory*, already popular, became still more so, and Elgar wished in vain to have new, less nationalistic, words sung to the tune. [2]

Elgar's other compositions during the war included incidental music for a children's play, *The Starlight Express* (1915); a ballet, *The Sanguine Fan* (1917); and *The Spirit of England* (1915â ^17, to poems by Laurence Binyon), three choral settings very different in character from the romantic patriotism of his earlier years. [2] His last large-scale composition of the war years was *The Fringes of the Fleet*, settings of verses by Rudyard Kipling, performed with great popular success around the country, until Kipling for unexplained reasons objected to their performance in theatres. [78] Elgar conducted a recording of the work for the Gramophone Company. [79]

Towards the end of the war, Elgar was in poor health. His wife thought it best for him to move to the countryside, and she rented 'Brinkwells', a house near Fittleworth in Sussex, from the painter Rex Vicat Cole. There Elgar recovered his strength and, in 1918 and 1919, he produced four large-scale works. The first three of these were chamber pieces: the Violin Sonata in EÂ minor, the Piano Quintet in A minor, and the String Quartet in E minor. On hearing the work in progress, Alice Elgar wrote in her diary, "E. writing wonderful new music". [80] All three works were well received. The Times wrote, "Elgar's sonata contains much that we have heard before in other forms, but as we do not at all want him to change and be somebody else, that is as it should be." [81] The quartet and quintet were premiered at the Wigmore Hall on 21 May 1919. The Manchester Guardian wrote, "This quartet, with its tremendous climaxes, curious refinements of dance-rhythms, and its perfect symmetry, and the quintet, more lyrical and passionate, are as perfect examples of chamber music as the great oratorios were of their type." [82]

By contrast, the remaining work, the Cello Concerto in E minor, had a disastrous premiere, at the opening concert of the London Symphony Orchestra's 1919â ^20 season in October 1919. Apart from the Elgar work, which the composer conducted, the rest of the programme was conducted by Albert Coates, who overran his rehearsal time at the expense of Elgar's. Lady Elgar wrote, "that brutal selfish ill-mannered bounder ... that brute Coates went on

rehearsing." [83] The critic of The Observer, Ernest Newman, wrote, "There have been rumours about during the week of inadequate rehearsal. Whatever the explanation, the sad fact remains that never, in all probability, has so great an orchestra made so lamentable an exhibition of itself. ... The work itself is lovely stuff, very simple â ^ that pregnant simplicity that has come upon Elgar's music in the last couple of years â ^ but with a profound wisdom and beauty underlying its simplicity." [84] Elgar attached no blame to his soloist, Felix Salmond, who played for him again later. [85] In contrast with the First Symphony and its hundred performances in just over a year, the Cello Concerto did not have a second performance in London for more than a year. [86]

Last years

Although in the 1920s Elgar's music was no longer in fashion, [1] his admirers continued to present his works when possible. Reed singles out a performance of the Second Symphony in March 1920 conducted by "a young man almost unknown to the public", Adrian Boult, for bringing "the grandeur and nobility of the work" to a wider public. Also in 1920, Landon Ronald presented an all-Elgar concert at the Queen's Hall. [87] Alice Elgar wrote with enthusiasm about the reception of the symphony, but this was one of the last times she heard Elgar's music played in public. [88] After a short illness, she died of lung cancer on 7 April 1920, at the age of seventy-two. [89]

Elgar was devastated by the loss of his wife. [85] With no public demand for new works, and deprived of Alice's constant support and inspiration, he allowed himself to be deflected from composition. His daughter later wrote that Elgar inherited from his father a reluctance to "settle down to work on hand but could cheerfully spend hours over some perfectly unnecessary and entirely unremunerative undertaking", a trait that became stronger after Alice's death. [90] For much of the rest of his life, Elgar indulged himself in his several hobbies. [1] Throughout his life he was a keen amateur chemist, sometimes using a laboratory in his back garden. [91] He enjoyed football, supporting Wolverhampton Wanderers F.C., for whom he composed an anthem, "He Banged the Leather for Goal", [92] and in his later years he frequently attended horseraces. His protégés, the conductor Malcolm Sargent and violinist Yehudi Menuhin, both recalled rehearsals with Elgar at which he swiftly satisfied himself that all was well and then went off to the races. [93] [94] In his younger days, Elgar had been an enthusiastic bicyclist, buying Royal Sunbeam bicycles for himself and his wife in 1903 (he named his "Mr. Phoebus") [95] As an elderly widower, he enjoyed being driven about the countryside by his chauffeur. [1] In 1923, he took a voyage to South America, journeying up the Amazon. Almost nothing is recorded about the events that Elgar encountered during the trip, which gave the historical novelist James Hamilton-Paterson considerable latitude when writing *Gerontius*, a fictional account of the journey. [96]

After Alice's death, Elgar sold the Hampstead house, and after living for a short time in a flat in St James's in the heart of London, he moved back to Worcestershire, to the village of Kempsey, where he lived from 1923 to 1927. [97] He did not wholly abandon composition in these years. He made large-scale symphonic arrangements of works by Bach and Handel and wrote his *Empire March* and eight songs *Pageant of Empire* for the 1924 British Empire Exhibition. [98] Shortly after these were published, he was appointed Master of the King's Musick on 13 May 1924, following the death of Sir Walter Parratt. [99]

From 1926 onwards, Elgar made a series of recordings of his own works. Elgar, described by the music writer Robert Philip as "the first composer to take the gramophone seriously", [100] had already recorded much of his music by the early acoustic-recording process for His Master's Voice (HMV) from 1914 onwards, but the introduction of electrical microphones in 1925 transformed the gramophone from a novelty into a realistic medium for reproducing orchestral and choral music. [100] Elgar was the first composer to take full advantage of this technological advance. [100] Fred Gaisberg of HMV, who produced Elgar's recordings, set up a series of sessions to capture on disc the composer's

interpretations of his major orchestral works, including the Enigma Variations, Falstaff, the first and second symphonies, and the cello and violin concertos. For most of these, the orchestra was the LSO, but the Variations were played by the Royal Albert Hall Orchestra. Later in the series of recordings, Elgar also conducted two newly founded orchestras, Boult's BBC Symphony Orchestra and Sir Thomas Beecham's London Philharmonic Orchestra.

Elgar's recordings were released on 78-rpm discs by both HMV and RCA Victor. After World War II, the 1932 recording of the Violin Concerto with the teenage Menuhin as soloist remained available on 78 and later on LP, but the other recordings were out of the catalogues for some years. When they were reissued by EMI on LP in the 1970s, they caused surprise to many by their fast tempi, in contrast to the slower speeds adopted by many conductors in the years since Elgar's death.[100] The recordings have subsequently been issued on compact disc.[101] These were reissued on CD in the 1990s.

In November 1931, Elgar was filmed by Pathé for a newsreel depicting a recording session of Pomp and Circumstance March No. 1 at the opening of EMI's Abbey Road Studios in London. It is believed to be the only surviving sound film of Elgar, who makes a brief remark before conducting the London Symphony Orchestra, asking the musicians to "play this tune as though you've never heard it before." [102] A memorial plaque to Elgar at Abbey Road was unveiled on 24 June 1993.[103]

A late piece of Elgar's, The Nursery Suite, was an early example of a studio premiere; its first performance was in the Abbey Road studios. For this work, dedicated to the wife and daughters of the Duke of York, Elgar once again drew on his youthful sketch-books.[2][n 16]

In his final years, Elgar experienced a musical revival. The BBC organised a festival of his works to celebrate his seventy-fifth birthday, in 1932.[104] He flew to Paris in 1933 to conduct the Violin Concerto for Menuhin. While in France, he visited his fellow composer Frederick Delius at his house at Grez-sur-Loing.[16] He was sought out by younger musicians such as Adrian Boult, Malcolm Sargent and John Barbirolli, who championed his music when it was out of fashion.[105][106] He began work on an opera, The Spanish Lady, and accepted a commission from the BBC to compose a Third Symphony. His final illness, however, prevented their completion. He fretted about the unfinished works. He asked Reed to ensure that nobody would "tinker" with the sketches and attempt a completion of the symphony,[107] but at other times he said, "If I can't complete the Third Symphony, somebody will complete it â ^ or write a better one." [108] After Elgar's death, Percy M. Young, in cooperation with the BBC and Elgar's daughter Carice, produced a version of The Spanish Lady,[109] which was issued on CD. The Third Symphony sketches were elaborated by the composer Anthony Payne into a complete score in 1998.[108]

Inoperable colorectal cancer was discovered during an operation on 8 October 1933.[110] Elgar died on 23 February 1934 at the age of seventy-six and was buried next to his wife at St. Â Wulstan's Church in Little Malvern.

Music

Influences, antecedents and early works

Elgar was contemptuous of folk music[111] and had little interest in or respect for the early English composers, calling William Byrd and his contemporaries "museum pieces". Of later English composers, he regarded Henry Purcell as the greatest, and he said that he had learned much of his own technique from studying Hubert Parry's writings.[112] The continental composers who most influenced Elgar were Handel, Dvořák and, to some degree, Brahms. In Elgar's chromaticism, the influence of Wagner is apparent, but Elgar's individual style of orchestration owes much to the clarity of nineteenth century French composers, Berlioz, Massenet, Saint-Saëns and, particularly, Delibes, whose music Elgar played and conducted at Worcester and greatly admired.[111][113]

Elgar began composing when still a child, and all his life he drew on his early sketchbooks for themes and inspiration. The habit of assembling his compositions, even large-scale ones, from scraps of themes jotted down randomly

remained throughout his life.[114] His early adult works included violin and piano pieces, music for the wind quintet in which he and his brother played between 1878â ^81, and music of many types for the Powick Asylum band. Diana McVeagh in Grove's Dictionary finds many embryonic Elgarian touches in these pieces, but few of them are regularly played, except *Salut d'Amour* and (as arranged decades later into *The Wand of Youth Suites*) some of the childhood sketches.[2] Elgar's sole work of note during his first spell in London in 1889â ^91, the overture *Froissart*, was a romantic-bravura piece, influenced by Mendelssohn and Wagner, but also showing further Elgarian characteristics.[2] Orchestral works composed during the subsequent years in Worcestershire include the *Serenade for Strings* and *Three Bavarian Dances*. In this period and later, Elgar wrote songs and partsongs. W. H. Reed expressed reservations about these pieces, but praised the partsong *The Snow*, for female voices, and *Sea Pictures*, a cycle of five songs for contralto and orchestra which remains in the repertory.[115]

Elgar's principal large-scale early works were for chorus and orchestra for the Three Choirs and other festivals. These were *The Black Knight*, *King Olaf*, *The Light of Life*, *The Banner of St George* and *Caractacus*. He also wrote a *Te Deum* and *Benedictus* for the Hereford Festival. Of these, McVeagh comments favourably on his lavish orchestration and innovative use of leitmotifs, but less favourably on the qualities of his chosen texts and the patchiness of his inspiration. McVeagh makes the point that, because these works of the 1890s were for many years little known (and performances remain rare), the mastery of his first great success, the *Enigma Variations*, appeared to be a sudden transformation from mediocrity to genius, but in fact his orchestral skills had been building up throughout the decade.[2]

Peak creative years

Elgar's best-known works were composed within the twenty-one years between 1899 and 1920. Most of them are orchestral. Reed wrote, "Elgar's genius rose to its greatest height in his orchestral works" and quoted the composer as saying that, even in his oratorios, the orchestral part is the most important.[116] The *Enigma Variations* made Elgar's name nationally. The variation form was ideal for him at this stage of his career, when his comprehensive mastery of orchestration was still in contrast to his tendency to write his melodies in short, sometimes rigid, phrases.[2] His next orchestral works, *Cockaigne* (In London Town), a concert-overture (1900â ^1901), the first two *Pomp and Circumstance* marches (1901), and the gentle *Dream Children* (1902), are all short: the longest of them, *Cockaigne*, lasting less than fifteen minutes. In the South (Allassio) (1903â ^1904), although designated by Elgar as a concert-overture, is, according to Kennedy, really a tone poem and the longest continuous piece of purely orchestral writing Elgar had essayed. He wrote it after setting aside an early attempt to compose a symphony.[117] The work reveals his continuing progress in writing sustained themes and orchestral lines, although some critics, including Kennedy, find that in the middle part "Elgar's inspiration burns at less than its brightest." [118] In 1905 Elgar completed the *Introduction and Allegro for Strings*. This work is based, unlike much of Elgar's earlier writing, not on a profusion of themes but on only three. Kennedy called it a "masterly composition, equalled among English works for strings only by Vaughan Williams's *Tallis Fantasia*." [119] Nevertheless, at less than a quarter of an hour, it was not by contemporary standards a lengthy composition. Gustav Mahler's *Seventh Symphony*, composed at the same time, runs for well over an hour.[n 17]

During the next four years, however, Elgar composed three major concert pieces, which, though shorter than comparable works by some of his European contemporaries, are among the most substantial such works by an English composer. These were his *First Symphony*, *Violin Concerto*, and *Second Symphony*, which all play for between forty-five minutes and an hour.[n 18] McVeagh says of the symphonies that they "rank high not only in Elgar's output but in English musical history. Both are long and powerful, without published programmes, only hints and quotations to indicate some inward drama from which

they derive their vitality and eloquence. Both are based on classical form but differ from it to the extent that ... they were considered prolix and slackly constructed by some critics. Certainly the invention in them is copious; each symphony would need several dozen music examples to chart its progress." [2]

Elgar's Violin Concerto and Cello Concerto, in the view of Kennedy, "rank not only among his finest works, but among the greatest of their kind". [121] They are, however, very different from each other. The Violin Concerto, composed in 1909 as Elgar reached the height of his popularity, and written for the instrument dearest to his heart, [115] is lyrical throughout and rhapsodical and brilliant by turns. [122] The Cello Concerto, composed a decade later, immediately after World War I, seems, in Kennedy's words, "to belong to another age, another world ... the simplest of all Elgar's major works ... also the least grandiloquent." [123] Between the two concertos came Elgar's symphonic study *Falstaff*, which has divided opinion even among Elgar's strongest admirers. Donald Tovey viewed it as "one of the immeasurably great things in music", with power "identical with Shakespeare's", [124] while Kennedy criticises the work for "too frequent reliance on sequences" and an over-idealised depiction of the female characters. [125] Reed thought that the principal themes show less distinction than some of Elgar's earlier works. [126] Elgar himself thought *Falstaff* the highest point of his purely orchestral work. [127]

The major works for voices and orchestra of the twenty-one years of Elgar's middle period are three large-scale works for soloists, chorus and orchestra: *The Dream of Gerontius* (1900), and the oratorios *The Apostles* (1903) and *The Kingdom* (1906); and two shorter odes, the *Coronation Ode* (1902) and *The Music Makers* (1912). The first of the odes, as a *pièce d'occasion*, has rarely been revived after its initial success, with the culminating "Land of Hope and Glory". The second is, for Elgar, unusual in that it contains several quotations from his earlier works, as Richard Strauss quoted himself in *A Hero's Life*. [128] The choral works were all successful, although the first, *Gerontius*, was and remains the best-loved and most performed. [129] On the manuscript Elgar wrote, quoting John Ruskin, "This is the best of me; for the rest, I ate, and drank, and slept, loved and hated, like another. My life was as the vapour, and is not; but this I saw, and knew; this, if anything of mine, is worth your memory." [2] All three of the large-scale works follow the traditional model with sections for soloists, chorus and both together. Elgar's distinctive orchestration, as well as his melodic inspiration, lifts them to a higher level than most of their British predecessors. [130]

Elgar's other works of his middle period include incidental music for *Grania and Diarmid*, a play by George Moore and W. B. Yeats (1901), and for *The Starlight Express*, a play based on a story by Algernon Blackwood (1916). Of the former, Yeats called Elgar's music "wonderful in its heroic melancholy". [131] Elgar also wrote a number of songs during his peak period, of which Reed observes, "it cannot be said that he enriched the vocal repertory to the same extent as he did that of the orchestra." [115]

Final years and posthumous completions

After the Cello Concerto, Elgar completed no more large-scale works. He made arrangements of works by Bach, Handel and Chopin, in distinctively Elgarian orchestration, [2] and once again turned his youthful notebooks to use for the *Nursery Suite* (1931). His other compositions of this period have not held a place in the regular repertory. [1] For most of the rest of the twentieth century, it was generally agreed that Elgar's creative impulse ceased after his wife's death. Anthony Payne's elaboration of the sketches for Elgar's Third Symphony led to a reconsideration of this supposition. Elgar left the opening of the symphony complete in full score, and those pages, along with others, show Elgar's orchestration changed markedly from the richness of his pre-war work. The Gramophone described the opening of the new work as something "thrilling ... unforgettably gaunt". [132] Payne also subsequently produced a performing version of the sketches for a sixth *Pomp and Circumstance* March, premiered at the Proms in August 2006. [133] Elgar's sketches for a piano

concerto dating from 1913 were elaborated by the composer Robert Walker and first performed in August 1997 by the pianist David Owen Norris. The realisation has since been extensively revised.[134]

Reputation

Views of Elgar's stature have varied in the decades since his music came to prominence at the beginning of the twentieth century. Richard Strauss, as noted, hailed Elgar as a progressive composer; even the hostile reviewer in *The Observer*, unimpressed by the thematic material of the First Symphony in 1908, called the orchestration "magnificently modern".[135] Hans Richter rated Elgar as "the greatest modern composer" in any country, and Richter's colleague Arthur Nikisch considered the First Symphony "a masterpiece of the first order" to be "justly ranked with the great symphonic models â ^ Beethoven and Brahms." [40] By contrast, the critic W. J. Turner, in the mid-twentieth century, wrote of Elgar's "Salvation Army symphonies," [113] and Herbert von Karajan called the Enigma Variations "second-hand Brahms".[136] Elgar's immense popularity was not long-lived. After the success of his First Symphony and Violin Concerto, his Second Symphony and Cello Concerto were politely received but without the earlier wild enthusiasm. His music was identified in the public mind with the Edwardian era, and after the First World War he no longer seemed a progressive or modern composer. In the early 1920s, even the First Symphony had only one London performance in more than three years.[1] Henry Wood and younger conductors such as Boult, Sargent and Barbirolli championed Elgar's music, but in the recording catalogues and the concert programmes of the middle of the century his works were not well represented.[2][137]

In 1924, the music scholar Edward J. Dent wrote an article for a German music journal in which he identified four features of Elgar's style that gave offence to a section of English opinion (namely, Dent indicated, the academic and snobbish section): "too emotional", "not quite free from vulgarity", "pompous", and "too deliberately noble in expression".[138] This article was reprinted in 1930 and caused controversy.[139] In the later years of the century there was, in Britain at least, a revival of interest in Elgar's music. The features that had offended austere taste in the inter-war years were seen from a different perspective. In 1955, the reference book *The Record Guide* wrote of the Edwardian background during the height of Elgar's career:

Boastful self-confidence, emotional vulgarity, material extravagance, a ruthless philistinism expressed in tasteless architecture and every kind of expensive yet hideous accessory: such features of a late phase of Imperial England are faithfully reflected in Elgar's larger works and are apt to prove indigestible today. But if it is difficult to overlook the bombastic, the sentimental, and the trivial elements in his music, the effort to do so should nevertheless be made, for the sake of the many inspired pages, the power and eloquence and lofty pathos, of Elgar's best work. ... Anyone who doubts the fact of Elgar's genius should take the first opportunity of hearing *The Dream of Gerontius*, which remains his masterpiece, as it is his largest and perhaps most deeply felt work; the symphonic study, *Falstaff*; the Introduction and Allegro for Strings; the Enigma Variations; and the Violoncello Concerto.[137]

By the 1960s, a less severe view was being taken of the Edwardian era. In 1966 the critic Frank Howes wrote that Elgar reflected the last blaze of opulence, expansiveness and full-blooded life, before World War I swept so much away. In Howes's view, there was a touch of vulgarity in both the era and Elgar's music, but "a composer is entitled to be judged by posterity for his best work. ... Elgar is historically important for giving to English music a sense of the orchestra, for expressing what it felt like to be alive in the Edwardian age, for conferring on the world at least four unqualified masterpieces, and for thereby restoring England to the comity of musical nations." [138]

In 1967 the critic and analyst David Cox considered the question of the supposed Englishness of Elgar's music. Cox noted that Elgar disliked folk-songs and never used them in his works, opting for an idiom that was essentially

German, leavened by a lightness derived from French composers including Berlioz and Gounod. How then, asked Cox, could Elgar be "the most English of composers"? Cox found the answer in Elgar's own personality, which "could use the alien idioms in such a way as to make of them a vital form of expression that was his and his alone. And the personality that comes through in the music is English." [113] This point about Elgar's transmuting his influences had been touched on before. In 1930 *The Times* wrote, "When Elgar's first symphony came out, someone attempted to prove that its main tune on which all depends was like the Grail theme in *Parsifal*. ... but the attempt fell flat because everyone else, including those who disliked the tune, had instantly recognized it as typically 'Elgarian', while the Grail theme is as typically Wagnerian." [140] As for Elgar's "Englishness", his fellow-composers recognised it: Richard Strauss and Stravinsky made particular reference to it, [40] and Sibelius called him, "the personification of the true English character in music ... a noble personality and a born aristocrat". [40]

Among Elgar's admirers there is disagreement about which of his works are to be regarded as masterpieces. The *Enigma Variations* are generally counted among them. [141] *The Dream of Gerontius* has also been given high praise by Elgarians, [142] and the *Cello Concerto* is similarly rated. [142] Many rate the *Violin Concerto* equally highly, but some do not. Sackville-West omitted it from the list of Elgar masterpieces in *The Record Guide*, [143] and in a long analytical article in *The Musical Quarterly*, Daniel Gregory Mason criticised the first movement of the concerto for a "kind of sing-songiness ... as fatal to noble rhythm in music as it is in poetry." [70] *Falstaff* also divides opinion. It has never been a great popular favourite, [144] and Kennedy and Reed identify shortcomings in it. [145] In a *Musical Times* 1957 centenary symposium on Elgar led by Vaughan Williams, by contrast, several contributors share Eric Blom's view that *Falstaff* is the greatest of all Elgar's works. [146]

The two symphonies divide opinion even more sharply. Mason rates the Second poorly for its "over-obvious rhythmic scheme", but calls the First "Elgar's masterpiece. ... It is hard to see how any candid student can deny the greatness of this symphony." [70] However, in the 1957 centenary symposium, several leading admirers of Elgar express reservations about one or both symphonies. [146] In the same year, Roger Fiske wrote in *The Gramophone*, "For some reason few people seem to like the two Elgar symphonies equally; each has its champions and often they are more than a little bored by the rival work." [147] The critic John Warrack wrote, "There are no sadder pages in symphonic literature than the close of the First Symphony's *Adagio*, as horn and trombones twice softly intone a phrase of utter grief", [148] whereas to Michael Kennedy, the movement is notable for its lack of anguished yearning and angst and is marked instead by a "benevolent tranquillity." [149]

Despite the fluctuating critical assessment of the various works over the years, Elgar's major works taken as a whole have in the twenty-first century recovered strongly from their neglect in the 1950s. *The Record Guide* in 1955 could list only one currently available recording of the First Symphony, none of the Second, one of the *Violin Concerto*, two of the *Cello Concerto*, two of the *Enigma Variations*, one of *Falstaff*, and none of *The Dream of Gerontius*. Since then there have been multiple recordings of all the major works. More than thirty recordings have been made of the First Symphony since 1955, for example, and more than a dozen of *The Dream of Gerontius*. [150] Similarly, in the concert hall, Elgar's works, after a period of neglect, are once again frequently programmed. The Elgar Society's website, in its diary of forthcoming performances, lists performances of Elgar's works by orchestras, soloists and conductors across Europe, North America and Australia. [151]

Honours, awards and commemorations

Elgar was knighted in 1904, and in 1911 he was appointed a member of the Order of Merit. In 1920 he received the Cross of Commander of the Belgian Order of the Crown; in 1924 he was made Master of the King's Musick; the following year he received the Gold Medal of the Royal Philharmonic Society; and in 1928 he was appointed a Knight Commander of the Royal Victorian Order (KCVO). Between

1900 and 1931, Elgar received honorary degrees from the Universities of Cambridge, Durham, Leeds, Oxford, Yale (USA), Aberdeen, Western Pennsylvania (USA), Birmingham and London. Foreign academies of which he was made a member were Regia Accademia di Santa Cecilia, Rome; Accademia del Reale Istituto Musicale, Florence; Académie des Beaux Arts, Paris; Institut de France; and American Academy of Arts. In 1931 he was created a Baronet, of Broadheath in the County of Worcester.[152] In 1933 he was promoted within the Royal Victorian Order to Knight Grand Cross (GCVO).[153][154] In Kennedy's words, he "shamelessly touted" for a peerage, but in vain.[1]

The house in Lower Broadheath where Elgar was born is now the Elgar Birthplace Museum, devoted to his life and work. Elgar's daughter, Carice, helped to found the museum in 1936 and bequeathed to it much of her collection of Elgar's letters and documents on her death in 1970. Carice left Elgar manuscripts to musical colleges: The Black Knight to Trinity College of Music; King Olaf to the Royal Academy of Music; The Music Makers to Birmingham University; the Cello Concerto to the Royal College of Music; The Kingdom to the Bodleian Library; and other manuscripts to the British Museum.[155] The Elgar Society dedicated to the composer and his works was formed in 1951. The University of Birmingham's Special Collections contain an archive of letters written by Elgar.[156]

Elgar's statue at the end of Worcester High Street stands facing the cathedral, only yards from where his father's shop once stood. Another statue of the composer by Rose Garrard is at the top of Church Street in Malvern, overlooking the town and giving visitors an opportunity to stand next to the composer in the shadow of the Hills that he so often regarded. In September 2005, a third statue sculpted by Jemma Pearson was unveiled near Hereford Cathedral in honour of his many musical and other associations with that city. It depicts Elgar with his bicycle. From 1999 until early 2007, new Bank of England twenty pound notes featured a portrait of Elgar. The change to remove his image generated controversy, particularly because 2007 was the 150th anniversary of Elgar's birth. From 2007 the Elgar notes were phased out, ceasing to be legal tender on 30 June 2010.[157]

There are around 65 roads in the UK named after Elgar, including six in the counties of Herefordshire and Worcestershire.[158] Among these are eleven Elgar Avenues, including one in Malvern, Worcestershire, and another close to the house where Elgar lived, Platts Gwyn in Hereford. A street in North Springfield, Virginia and a major road in Box Hill, Melbourne, are also named after him. Elgar had three locomotives named in his honour[159] (all of them renamings). The first was a Bulldog class locomotive of the Great Western Railway (GWR): it was built in May 1906 as no. 3704, renumbered 3414 in December 1912, named A. H. Mills in July 1914, renamed Sir Edward Elgar in August 1932, and withdrawn from service in October 1938.[160] The second was a Castle class locomotive, also of the GWR: it was built in June 1946 as no. 7005 Lamphey Castle,[161] renamed Sir Edward Elgar in August 1957 and withdrawn from service in September 1964.[162] The third was a British Rail Class 50 diesel locomotive: it was built in March 1968 as no. D407, renumbered 50 007 in the mid-1970s, named Hercules in April 1978, and renamed Sir Edward Elgar in February 1984.[163] The new nameplates were specially cast in the former Great Western Railway style.[158] On 25 February 1984, this locomotive was officially named "Sir Edward Elgar" at Paddington station in London by Simon Rattle, then conductor of the City of Birmingham Symphony Orchestra.[164]

Elgar's life and music have inspired works of literature including the novel *Gerontius*[96] and several plays. Elgar's Rondo, a 1993 stage play by David Pownall depicts the dead Jaeger offering ghostly advice on Elgar's musical development.[165] Pownall also wrote a radio play, *Elgar's Third* (1994);[166] another Elgar-themed radio play is Alick Rowe's *The Dorabella Variation* (2003).[167] David Rudkin's BBC television "Play for Today" *Penda's Fen* (1974)[168] deals with themes including sex and adolescence, spying, and snobbery, with Elgar's music, chiefly *The Dream of Gerontius*, as its background. In one scene, a ghostly Elgar whispers the secret of the "Enigma"

tune to the youthful central character, with an injunction not to reveal it. Elgar on the Journey to Hanley, a novel by Keith Alldritt (1979), tells of the composer's attachment to Dora Penny, later Mrs Powell, (depicted as "Dorabella" in the Enigma Variations), and covers the fifteen years from their first meeting in the mid-1890s to the genesis of the Violin Concerto when, in the novel, Dora has been supplanted in Elgar's affections by Alice Stuart-Wortley.[169]

Perhaps the best-known work depicting Elgar is Ken Russell's 1962 BBC television film *Elgar*, made when the composer was still largely out of fashion. This hour-long film contradicted the view of Elgar as a jingoistic and bombastic composer, and evoked the more pastoral and melancholy side of his character and music.[170]

Selected works

The following have been selected as representative of Elgar's works, based on quality, significance and popularity.

Orchestral

Froissart, concert overture, Op. 19 (1890)
Serenade for Strings, Op. 20 (1888â ^1892)
Variations on an Original Theme (Enigma), Op. 36 (1899)
includes Variation 9 Nimrod
Cockaigne (In London Town), concert overture, Op. 40 (1900â ^1901)
Pomp and Circumstance, five marches, all Op. 39 (1901â ^1930)
In the South (Alassio), concert overture, Op. 50 (1903â ^1904)
Introduction and Allegro for strings (quartet and orchestra), Op. 47 (1904â ^05)
The Wand of Youth, suites Nos. 1 and 2, Opp. 1a/b (1867â ^71, rev. 1907/8)
Symphony No. 1 in A-flat, Op. 55 (1907â ^1908)
Violin Concerto in B minor, Op. 61 (1909â ^1910)
Romance for bassoon and orchestra, Op. 62 (1910)
Symphony No. 2 in E-flat, Op. 63 (1909â ^1911)
Falstaff, symphonic study, Op. 68 (1913)
Cello Concerto in E minor, Op. 85 (1918â ^1919)
The Severn Suite, Op. 87 (1930) (for brass band, trans. for orchestra 1932)

Cantatas and oratorios

The Black Knight, symphony/cantata for chorus and orchestra, Op. 25 (1889â ^1892)
The Light of Life (Lux Christi), oratorio for soprano, alto, tenor and bass soloists, chorus and orchestra, Op. 29 (1896)
Scenes From The Saga Of King Olaf, cantata for soprano, tenor and bass soloists, chorus and orchestra, Op. 30 (1896)
Caractacus, cantata for soprano, tenor, baritone and bass soloists, chorus and orchestra, Op. 35 (1897â ^1898)
The Dream of Gerontius, for mezzo-soprano, tenor and bass soloists, chorus and orchestra, Op. 38 (1899â ^1900)
The Apostles, oratorio for soprano, contralto, tenor and three bass soloists, chorus and orchestra, Op. 49 (1902â ^1903)
The Kingdom, oratorio for soprano, contralto, tenor and bass soloists, chorus and orchestra, Op. 51 (1901â ^1906)
The Music Makers, ode for contralto or mezzo-soprano soloist, chorus and orchestra, Op. 69 (1912)

Songs

Partsongs

"O Happy Eyes", SATB unacc., words by C. Alice Elgar, Op. 18 No.1 (1890)
"My Love Dwelt in a Northern Land", SATB unacc., words by Andrew Lang, dedicated to Rev. J. Hampton (1890)
"The Snow", SSA acc. 2 violins and piano, words by C. Alice Elgar, dedicated to Mrs. E. B. Fitton, Op. 26 No.1 (1894) (also with orchestral accompaniment, 1903, and various other combinations of voices SATB etc.)
"Go, Song of Mine", SSAATB unacc., words by Cavalcanti, tr. D. G. Rossetti, dedicated to Alfred H. Littleton,[n 19] Op. 57 (1909)
"The Shower" and "The Fountain", SATB unacc., words by Henry Vaughan, Op. 71 Nos.1 and 2 (1914)

Church music

Three motets: "Ave verum corpus", "Ave Maria" and "Ave Maris Stella", Op. 2 (1887)

Te Deum and Benedictus, Op. 34 (1897)

Chamber music

Keyboard

Arrangements

See also

Notes and references

Notes

^ His siblings were Henry John ("Harry"; 1848â ^64), Lucy Ann ("Loo") (born 1852), Susannah Mary ("Pollie"; born 1854), Frederick Joseph ("Jo"; 1859â ^66), Francis Thomas ("Frank"; born 1861), and Helen Agnes ("Dott" or "Dot"; born 1864).[3]

^ William Elgar was evidently sceptical of any branch of the church: he wrote of "the absurd superstition and play-house mummery of the Papist; the cold and formal ceremonies of the Church of England; or the bigotry and rank hypocrisy of the Wesleyan." [4]

^ Elgar himself later said, "There is music in the air, music all around us, the world is full of it and you simply take as much as you require", [8] and "The trees are singing my music â ^ or have I sung theirs?" [9]

^ It is spelt "Littleton" by all the Elgar authorities cited; however, some current sources, for example English Heritage, spell it "Lyttleton".

^ A profile in The Musical Times reported that Elgar "read a great deal at this formulative period of his life. ... In this way he made the acquaintance of Sir Philip Sidney's Arcadia, Richard Baker's Chronicles, Michael Drayton's Polyolbion", and the works of Voltaire." [12]

^ Kennedy (ODNB) mentions the 'Romanza' variation (no. 13) in the Enigma Variations and the Violin Concerto as possible examples, the former being headed "*****" and the latter being inscribed as enshrining an unnamed soul.

^ When Elgar was knighted in 1904, his daughter Carice said, "I am so glad for Mother's sake that Father has been knighted. You see â ^ it puts her back where she was". [23]

^ Salut d'Amour became one of Elgar's best-selling works, but initially he earned no royalties, having sold the copyright to the publisher Schott for a flat fee of 2 guineas; Schott later decided to pay him royalties. [1][2]

^ Sullivan said to Elgar, "But, my dear boy, I hadn't the slightest idea of it â ^ why on earth didn't you come and tell me? I'd have rehearsed it myself for you". [27]

^ Elgar, in recommending Coleridge-Taylor for a commission from the festival, said, "He is far and away the cleverest fellow going among the young men." [30]

^ It is not known whether Elgar meant a musical theme or a more general non-musical theme such as that of friendship. Many attempts have been made to find well-known tunes that can be played in counterpoint with Elgar's main musical theme of the piece, from Auld Lang Syne to a theme from Mozart's Prague Symphony. [34]

^ For example, according to the Elgar Society's website, in April and May 2010, the Variations were programmed in New Orleans, New York, Vancouver, Denver, Moscow, Washington D.C. and KrakÃ³w.

^ Strauss and Elgar remained on friendly terms for the rest of Elgar's life, and Strauss paid him a warm obituary tribute in 1934. [40]

^ Elgar's principal target was J.A. Fuller Maitland, music critic of The Times, whose patronising obituary of Arthur Sullivan repelled Elgar; [59] in his Birmingham lectures he alluded to it as "the shady side of musical criticism ... that foul unforgettable episode." [60]

^ This was the occasion on which the American tradition of playing the trio of the first Pomp and Circumstance March at graduation ceremonies originated.

^ The elder daughter was Princess Elizabeth of York (later Queen Elizabeth II).

^ Timing from the recording of the Mahler symphony by Michael Gielen and the

South West German Radio Symphony Orchestra, Baden-Baden, Haenssler Classic CD93.030. Elgar did not know Mahler's works.[120]

^ In a series of transfers of the composer's electrical recordings available in 2010, the timings are: Symphony No. 1: 46:28 (Naxos Historical CD 8.111256); Symphony No. 2: 48:30 (Naxos Historical CD 8.111260); Violin Concerto: 49:57 (Naxos Historical CD 8.110902).

^ Alfred Henry Littleton was chairman of the publishers Novello. At the time that he wrote the song, Elgar and his wife were staying at the villa of his friend Julia Worthington at Careggi near Florence when they were visited by Littleton, whose wife had just died.[171]

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Persondata

Name

Elgar, Edward

Alternative names
Elgar, Edward William
Short description
English composer
Date of birth
2 June 1857
Place of birth
Lower Broadheath, England
Date of death
23 February 1934
Place of death

George Percy Aldridge Grainger (8 July 1882 – 20 February 1961), known as Percy Grainger, was an Australian-born composer, arranger and pianist. In the course of a long and innovative career he played a prominent role in the revival of interest in British folk music in the early years of the 20th century. He also made many adaptations of other composers' works. Although much of his work was experimental and unusual, the piece with which he is most generally associated is his piano arrangement of the folk-dance tune "Country Gardens".

Grainger left Australia at the age of 13 to attend the Hoch Conservatory in Frankfurt. Between 1901 and 1914 he was based in London, where he established himself first as a society pianist and later as a concert performer, composer and collector of original folk melodies. As his reputation grew he met many of the significant figures in European music, forming important friendships with Frederick Delius and Edvard Grieg. He became a champion of Nordic music and culture, his enthusiasm for which he often expressed in private letters.

In 1914 Grainger moved to the United States, where he lived for the rest of his life, though he travelled widely in Europe and in Australasia. He served briefly as a bandsman in the US Army during 1917–18, and took US citizenship in 1918. After his mother's suicide in 1922 he became increasingly involved in educational work. He also experimented with music machines that he hoped would supersede human interpretation. In the 1930s he set up the Grainger Museum in Melbourne, his birthplace, as a monument to his life and works and as a future research archive. As he grew older he continued to give concerts and to revise and rearrange his own compositions, while writing little new music. After the Second World War, ill health reduced his levels of activity, and he considered his career a failure. He gave his last concert in 1960, less than a year before his death.

[edit] Early life

[edit] Family background

Percy Grainger's father, John Grainger (1854–1917),^[n 1] was a British-born architect who emigrated to Australia in 1877. He won professional recognition for his design of the Princes Bridge across the Yarra River in Melbourne.^[2] In October 1880 he married Rose Annie Aldridge, daughter of Adelaide hotelier George Aldridge; the couple settled in New St, Brighton, a suburb of Melbourne, where their only son, christened George Percy Grainger, was born on 8 July 1882.^[3] The Grainger house at 305 New St, Brighton has recently been redeveloped, with the original structure intact.

John Grainger was an accomplished artist, with broad cultural interests and a wide circle of friends.^[4] These included David Mitchell, whose daughter Helen later gained worldwide fame as an operatic soprano under the name Nellie Melba. John's claims to have "discovered" her are unfounded, although he may have offered her encouragement.^[5] John was a heavy drinker and a womaniser who, Rose learned after the marriage, had fathered a child in England before coming to Australia. His promiscuous lifestyle placed heavy strains upon the relationship, particularly when Rose discovered shortly after Percy's birth that she had contracted a form of syphilis from her husband.^{[3][4]} Despite this, the Graingers stayed together until 1890, when John went to England for medical treatment. After his return to Australia they lived apart; the burden

of raising Percy fell to Rose,[6] while John pursued his career as chief architect to the Western Australian Department of Public Works. He also designed Nellie Melba's home, Coombe Cottage, at Coldstream.[2]

[edit] Childhood

Except for three months' formal schooling as a 12-year-old, during which he was bullied and ridiculed by his classmates, Percy was educated at home.[4] Rose, an autodidact with a dominating presence, supervised his music and literature studies and engaged other tutors for languages, art and drama. From his earliest lessons Percy developed a lifelong fascination with Nordic culture; writing late in life he maintained that the Icelandic "Saga of Grettir the Strong" was "the strongest single artistic influence on my life".[7][8][9] As well as showing precocious musical talents, he displayed considerable early gifts as an artist, to the extent that his tutors thought his future might lie in art rather than music.[10] At the age of 10 he began studying piano under Louis Pabst, a German emigr  then considered to be Melbourne's leading piano teacher. Grainger's first known composition, "A Birthday Gift to Mother", is dated 1893.[2] Pabst arranged Grainger's first public concert appearances, at Melbourne's Masonic Hall in July and September 1894. The boy played works by Bach, Beethoven, Schumann and Scarlatti, and was warmly complimented in the Melbourne press.[11]

After Pabst returned to Europe in the autumn of 1894, Grainger's new piano tutor, Adelaide Burkitt, arranged for his appearances at a series of concerts in October 1894, at Melbourne's Royal Exhibition Building. The size of this enormous venue horrified the young pianist; nevertheless, his performance delighted the Melbourne critics who dubbed him "the flaxen-haired phenomenon who plays like a master".[12] This public acclaim helped Rose to decide that her son should continue his studies at the Hoch Conservatory in Frankfurt am Main, Germany   she had been recommended to this institution by William Laver, head of piano studies at Melbourne's Conservatorium of music. Financial assistance was secured through a fund-raising benefit concert in Melbourne and a final recital in Adelaide, after which mother and son left Australia for Europe on 29 May 1895.[13] Although he never returned permanently to Australia, Grainger maintained considerable patriotic feelings for his native land,[14] and was proud of his Australian heritage.[2]

[edit] Frankfurt

In Frankfurt, Rose established herself as a teacher of English; her earnings were supplemented by contributions from John Grainger, who had settled in Perth. The Hoch Conservatory's reputation for piano teaching had been enhanced by the tenure, until 1892, of Clara Schumann as head of piano studies. Grainger's piano tutor was James Kwast, who developed his young pupil's skills to the extent that, within a year, Grainger was being lauded as a prodigy.[15] Grainger had difficult relations with his original composition teacher, Iwan Knorr;[4] he withdrew from Knorr's classes to study composition privately with an amateur composer and folk-music enthusiast, Karl Klimesch, whom he would later honour as "my only composition teacher".[2]

Together with a group of slightly older British students   Roger Quilter, Balfour Gardiner, Cyril Scott and Norman O'Neill, all of whom became his friends   Grainger helped form the "Frankfurt Group", whose long-term objective was to rescue British and Scandinavian music from what they considered the negative influences of central European music.[4] Encouraged by Klimesch, Grainger turned away from composing classical pastiches reminiscent of Handel, Haydn and Mozart,[16] and developed a personal compositional style the originality and maturity of which quickly impressed and astonished his friends.[14] At this time Grainger discovered the poetry of Rudyard Kipling and began setting it to music; according to Scott, "No poet and composer have been so suitably wedded since Heine & Schumann".[14]

After accompanying her son on an extended European tour in the summer of 1900 Rose, whose health had been poor for some time, suffered a nervous collapse and could no longer work.[17] To replace lost income Grainger began giving piano lessons and public performances; his first solo recital was in Frankfurt on 6

December 1900.[2] Meanwhile he continued his studies with Kwast, and increased his repertoire until he was confident he could maintain himself and his mother as a concert pianist. Having chosen London as his future base, in May 1901 Grainger abandoned his studies and, with Rose, left Frankfurt for England.[17]

Before leaving Frankfurt, Grainger had fallen in love with Kwast's daughter Mimi;[17] in an autobiographical essay dated 1947 he admits to being "already sex-crazy" at this time.[18] (Mimi Kwast, who was the grand-daughter of Ferdinand Hiller, married another of her father's pupils, Hans Pfitzner.) John Bird, Grainger's biographer, also records that during his Frankfurt years Grainger began to develop sexual appetites that were "distinctly abnormal"; by the age of 16 he had started to experiment in flagellation and other sado-masochistic practices, which he continued to pursue through most of his adult life. Bird surmises that Grainger's fascination with themes of punishment and pain derived from the harsh discipline to which Rose had subjected him as a child.[18]

[edit] London years

[edit] Concert pianist

In London, Grainger's charm, good looks and talent (with some assistance from the local Australian community) ensured that he was quickly taken up as a pianist by wealthy patrons, and was soon performing in concerts in private homes. The Times critic recorded after one such appearance that Grainger's playing "revealed rare intelligence and a good deal of artistic insight".[19] In 1902 he was presented by the socialite Lillith Lowrey to Queen Alexandra, who thereafter frequently attended his London recitals.[20] Lowrey, 20 years Grainger's senior, traded patronage and contacts for sexual favours â ^ he termed the relationship a "love-serve job".[8] She was the first woman with whom he had sex; he later wrote of this initial encounter that he had experienced "an overpowering landslide" of feeling, and that "I thought I was about to die. If I remember correctly, I only experienced fear of death. I don't think that any joy entered into it".[21]

In February 1902 Grainger made his first appearance as a piano soloist with an orchestra, playing Tchaikovsky's first piano concerto with the Bath Pump Room Orchestra. In October of that year he toured Britain in a concert party with Adelina Patti, the Italian-born opera singer. Patti was greatly taken by the young pianist and prophesied a glorious career for him.[22] The following year he met the German-Italian composer and pianist Ferruccio Busoni. Initially the two men were on cordial terms (Busoni offered to give Grainger lessons free of charge) and as a result, Grainger spent part of the 1903 summer in Berlin as Busoni's pupil.[2] However, the visit was not a success; as Bird notes, Busoni had expected "a willing slave and adoring disciple", a role Grainger was not willing to fulfil.[23] Grainger returned to London in July 1903; almost immediately he departed with Rose on a 10-month tour of Australia, New Zealand and South Africa, as a member of a party organised by the Australian contralto Ada Crossley.[24]

[edit] Emergent composer

Before going to London Grainger had composed numerous Kipling settings, and his first mature orchestral pieces.[25] In London, when he found time he continued to compose; a letter to Balfour Gardiner dated 21 July 1901 indicates that he was working on his Marching Song of Democracy (a Walt Whitman setting), and had made good progress with the experimental works Train Music and Charging Irishrey.[26] In his early London years he also composed Hill Song Number 1 (1902), an instrumental piece much admired by Busoni.[25][27]

In 1905, inspired by a lecture given by the pioneer folksong historian Lucy Broadwood, Grainger began to collect original folksongs. Starting at Brigg in Lincolnshire, over the next five years he gathered and transcribed more than 300 songs from all over the country, including much material that had never been written down before. From 1906 Grainger used a phonograph, one of the first collectors to do so, and by this means he assembled more than 200 Edison cylinder recordings of native folk singers.[28][29] These activities coincided with what Bird calls "the halcyon days of the 'First English Folksong

Revival'".[30]

As his stature in the music world increased, Grainger became acquainted with many of its leading figures, including Vaughan Williams, Elgar, Richard Strauss and Debussy.[28] In 1907 he met Frederick Delius, with whom he achieved an immediate rapport â ^ the two musicians had similar ideas about composition and harmony, and shared a dislike for the classical German masters.[31] Both were inspired by folk music;[32] Grainger gave Delius his setting of the folksong Brigg Fair, which the older composer developed into his famous orchestral rhapsody, dedicated to Grainger.[31] The two remained close friends until Delius's death in 1934.[33]

Grainger first met Grieg at the home of the London financier Sir Edgar Speyer, in May 1906.[34] As a student Grainger had learned to appreciate the Norwegian's harmonic originality, and by 1906 had several Grieg pieces in his concert repertoire, including the piano concerto.[35] Grieg was greatly impressed with Grainger's playing, and wrote that the Australian was "a genius that we Scandinavians cannot do other than love." [36] Through 1906â ^7 the two maintained a mutually complimentary correspondence, which culminated in Grainger's ten-day visit in July 1907 to the composer's Norwegian home, "Troldhaugen" near Bergen. Here the two spent much time revising and rehearsing the piano concerto in preparation for that year's Leeds Festival. Their plans for a long-term working relationship were thwarted by Grieg's sudden death in September 1907; this relatively brief acquaintance had a considerable impact on Grainger, and he championed Grieg's music for the rest of his life.[35]

After fulfilling a hectic schedule of concert engagements in Britain and continental Europe, in August 1908 Grainger accompanied Ada Crossley on a second Australasian tour, during which he added several cylinders of Maori and Polynesian music to his collection of recordings.[28] He had resolved to establish himself as a top-ranking pianist before promoting himself as a composer,[9] though he continued to compose both original works and folksong settings. Some of his most successful and most characteristic pieces, such as "Mock Morris", "Handel in the Strand", "Shepherd's Hey" and "Molly on the Shore" date from this period. In 1908 he obtained the tune of "Country Gardens" from the folk music specialist Cecil Sharp, though he did not fashion it into a performable piece for another ten years.[37][38] In 1911 Grainger finally felt confident enough of his standing as a pianist to begin large-scale publishing of his compositions, at the same time adopting the professional name of "Percy Aldridge Grainger".[8][39]

In a series of concerts arranged by Balfour Gardiner at London's Queen's Hall in March 1912, five of Grainger's works were performed to great public acclaim; the band of thirty guitars and mandolins for the performance of "Fathers and Daughters" created a particular impression.[40] On 21 May 1912 Grainger presented the first concert devoted entirely to his own compositions, at the Aeolian Hall, London;[9] the concert was, he reported, "a sensational success".[41] A similarly enthusiastic reception was given to Grainger's music at a second series of Gardiner concerts the following year.[42]

In 1905 Grainger began a close friendship with Karen Holten, a Danish music student who had been recommended to him as a piano pupil. She became an important confidante; the relationship persisted for eight years, largely through correspondence.[43][n 2] After her marriage in 1916 she and Grainger continued to correspond and occasionally meet until her death in 1953. Grainger was briefly engaged in 1913 to another pupil, Margot Harrison, but the relationship foundered through a mixture of Rose's over-possessiveness and Grainger's indecision.[45][46]

[edit] Career Maturity

[edit] Departure for America

In April 1914 Grainger gave his first performance of Delius's piano concerto, at a music festival in Torquay. Thomas Beecham, who was one of the festival's guest conductors, reported to Delius that "Percy was good in the forte passages, but made far too much noise in the quieter bits".[47] Grainger was receiving increasing recognition as a composer; leading musicians and

orchestras were adding his works to their repertoires.[45] His decision to leave England for America in early September 1914, after the outbreak of the First World War, damaged his reputation among his patriotically minded British friends.[2] Grainger wrote that the reason for this abrupt departure was "to give mother a change".[48] However, according to Bird, Grainger often explained that his reason for leaving London was that "he wanted to emerge as Australia's first composer of worth, and to have laid himself open to the possibility of being killed would have rendered his goal unattainable".[49] The Daily Telegraph music critic Robin Legge accused him of cowardice, and told him not to expect a welcome in England after the war,[8] words that hurt Grainger deeply.[50]

Grainger's first American tour began on 11 February 1915 with a recital at New York's Aeolian Hall. He played works by Bach, Brahms, Handel and Chopin alongside two of his own compositions: "Colonial Song" and "Mock Morris". In July 1915 Grainger had formally registered his intention to apply for US citizenship.[51] Over the next two years his engagements included concerts with Nellie Melba in Boston and Pittsburgh and a command performance before President Woodrow Wilson. In addition to his concert performances, Grainger secured a contract with the Duo-Art Company for making pianola rolls, and signed a recording contract with Columbia.[9]

In April 1917 Grainger received news of John Grainger's death in Perth.[52] On 9 June 1917, after America's entry into the war, he enlisted as a bandsman in the Coast Artillery Corps of the US Army. He had joined as a saxophonist,[n 3] though he records learning the oboe: "I long for the time when I can blow my oboe well enough to play in the band".[55] In his 18 months' service, Grainger made frequent appearances as a pianist at Red Cross and Liberty bond concerts. As a regular encore he began to play a piano setting of the tune "Country Gardens". The piece became instantly popular; sheet music sales quickly broke many publishing records.[56] The work was to become synonymous with Grainger's name through the rest of his life, though he came in time to detest it.[57] On 3 June 1918 he became a naturalised American citizen.[58]

[edit] Career zenith

After leaving the army in January 1919, Grainger refused an offer to become conductor of the Saint Louis Symphony Orchestra and resumed his career as a concert pianist.[59] He was soon performing around 120 concerts a year,[60] generally to great critical acclaim, and in April 1921 reached a wider audience by performing in a cinema, New York's Capitol Theatre. Grainger commented that the huge audiences at these cinema concerts often showed greater appreciation for his playing than those at established concert venues such as Carnegie Hall and the Aeolian.[61] In the summer of 1919 he led a course in piano technique at Chicago Musical College, the first of many such educational duties he would undertake in later years.[62][63]

Amid his concert and teaching duties, Grainger found time to rescore many of his works (a habit he continued throughout his life) and also to compose new pieces: his Children's March: Over the Hills and Far Away, and the orchestral version of The Power of Rome and the Christian Heart both originated in this period.[64] His close friend Ralph Leopold, whom he met while in the army, participated in the premieres of both versions of the Children's March, and also recorded a number of four-hand works with him on piano rolls. He also began to develop the technique of elastic scoring, a form of flexible orchestration which enabled works to be performed by different numbers of players and instrument types, from small chamber groups up to full orchestral strength.[65]

In April 1921 Grainger moved with his mother to a large house in White Plains, New York. This was his home for the remainder of his life.[8] From the beginning of 1922 Rose's health deteriorated sharply; she was suffering from delusions and nightmares, and became fearful that her illness would harm her son's career.[66] Because of the closeness of the bond between the two, there had long been rumours that their relationship was incestuous;[57] in April 1922 Rose was directly challenged over this issue by her friend Lotta Hough.[67] From her last letter to Grainger, dated 29 April, it seems that this

confrontation unbalanced Rose; on 30 April, while Grainger was touring on the West Coast, she jumped to her death from an office window on the 18th floor of the Aeolian Building in New York City.[68] The letter, which began "I am out of my mind and cannot think properly", asked Grainger if he had ever spoken to Lotta of "improper love". She signed the letter: "Your poor insane mother".[69]

[edit] Inter-war years

[edit] Traveller

After Rose's funeral, Grainger sought solace in a return to work. In autumn 1922 he left for a year-long trip to Europe, where he collected and recorded Danish folksongs before a concert tour that took him to Norway, Holland, Germany and England. In Norway he stayed with Delius at the latter's summer home. Delius was by now almost blind; Grainger helped fulfil his friend's wish to see a Norwegian sunset by carrying him (with some assistance) to the top of a nearby mountain peak.[70] He returned to White Plains in August 1923.[71]

Although now less committed to a year-round schedule of concerts, Grainger remained a very popular performer. His eccentricities, often exaggerated for publicity reasons, reportedly included running into auditoriums in gym kit and leaping over the grand piano to create a grand entrance.[72] While he continued to revise and rescore his compositions, he increasingly worked on arrangements of music by other composers,[73] in particular works by Bach, Brahms, Faur  and Delius.[74] Away from music, Grainger's preoccupation with Nordic culture led him to develop a form of English which, he maintained, reflected the character of the language before the Norman conquest. Words of Norman or Latin origin were replaced by supposedly Nordic word-forms, such as "blend-band" (orchestra), "forthspeaker" (lecturer) and "writ-piece" (article). He called this "blue-eyed" English.[75] His convictions of Nordic superiority eventually led Grainger, in letters to friends, to express his views in crudely racial and anti-Semitic terms; the music historian David Pear describes Grainger as, "at root, a racial bigot of no small order".[76][n 4]

Grainger made further trips to Europe in 1925 and 1927, collecting more Danish folk music with the aid of the octogenarian ethnologist Evald Tang Kristensen; this work formed the basis of the Suite on Danish Folksongs of 1928  30.[9] He also visited Australia and New Zealand, in 1924 and again in 1926. In November 1926, while returning to America, he met Ella Str m, a Swedish-born artist with whom he developed a close friendship. On arrival in America the pair separated, but were reunited in England the following autumn after Grainger's final folksong expedition to Denmark. In October 1927 the couple agreed to marry.[80] Ella had a daughter, Elsie, who had been born out of wedlock in 1909. Grainger always acknowledged her as a family member, and developed a warm personal relationship with her.[81]

Although Bird asserts that before her marriage, Ella knew nothing of Grainger's sado-masochistic interests,[82] in a letter dated 23 April 1928 (four months before the wedding) Grainger writes to her: "As far as my taste goes, blows [with the whip] are most thrilling on breasts, bottom, inner thighs, sexparts". He later adds, "I shall thoroly thoroly [sic] understand if you cannot in any way see yr way to follow up this hot wish of mine".[83] The couple were married on 9 August 1928 at the Hollywood Bowl, at the end of a concert which, in honour of the bride, had included the first performance of Grainger's bridal song "To a Nordic Princess".[9]

[edit] Educator

From the late 1920s and early 1930s Grainger became involved increasingly with educational work in schools and colleges,[9] and in late 1931 accepted a year's appointment for 1932  33 as professor of music at New York University (NYU). In this role he delivered a series of lectures under the heading "A General Study of the Manifold Nature of Music", which introduced his students to a wide range of ancient and modern works.[9] On 25 October 1932 his lecture was illustrated by Duke Ellington and his band, who appeared in person; Grainger admired Ellington's music, seeing harmonic similarities with Delius. On the whole, however, Grainger did not enjoy his tenure at NYU; he disliked the institutional formality, and found the university generally unreceptive to his

ideas. Despite many offers he never accepted another formal academic appointment, and refused all offers of honorary degrees.[84][n 5] His New York lectures became the basis for a series of radio talks which he gave for the Australian Broadcasting Commission in 1934³⁵; these were later summarised and published as *Music: A Commonsense View of All Types*.^[2] On 3 and 4 September 1934 Grainger adjudicated at the Sydney Eisteddfod on Sections 10 (Vocal Ensemble) and 45 (String Ensemble) for which he selected and provided the music. In 1937 Grainger began an association with the Interlochen International Music Camp, and taught regularly at its summer schools until 1944.[86]

[edit] Innovator

The idea of establishing a Grainger Museum in Australia had first occurred to Grainger in 1932. He began collecting and recovering from friends letters and artifacts, even those demonstrating the most private aspects of his life,[87] such as whips, bloodstained shirts and revealing photographs.[88] In September 1933 he and Ella went to Australia to begin supervising the building work. To finance the project, Grainger embarked on a series of concerts and broadcasts,[89] in which he subjected his audiences to a vast range of the world's music in accordance with his "universalist" view. Controversially, he argued for the superior achievements of Nordic composers over traditionally recognised masters such as Mozart and Beethoven.^[2]

Among various new ideas, Grainger introduced his so-called "free-music" theories. He believed that conformity with the traditional rules of set scales, rhythms and harmonic procedures amounted to "absurd goose-stepping", from which music should be set free.[90] He demonstrated two experimental compositions of free music, performed initially by a string quartet and later by the use of electronic theremins.[8] He believed that ideally, free music required non-human performance, and spent much of his later life developing machines to fulfil this vision.[91]

While the building of the museum proceeded, the Graingers visited England for several months in 1936, during which Grainger made his first BBC broadcast. In this, he conducted "Love Verses from The Song of Solomon" in which the tenor soloist was the then unknown Peter Pears.[92] After spending 1937 in America, Grainger returned to Melbourne in 1938 for the official opening of the Museum; among those present at the ceremony was his old piano teacher Adelaide Burkitt. The museum did not open to the general public during Grainger's lifetime, but was available to scholars for research.[93][94]

In the late 1930s Grainger spent much time arranging his works in settings for wind bands. He wrote A Lincolnshire Posy for the March 1937 convention of the American Band Masters' Association in Milwaukee,[95] and in 1939, on his last visit to England before the Second World War, he composed "The Duke of Marlborough's Fanfare", giving it the subtitle "British War Mood Grows".[93]

[edit] Later career

[edit] Second World War

The outbreak of war in Europe in September 1939 curtailed Grainger's overseas travelling. In the autumn of 1940, alarmed that the war might precipitate an invasion of the United States eastern seaboard, he and Ella moved to Springfield, Missouri, in the centre of the continent.[96] From 1940 Grainger played regularly in charity concerts, especially after the attack on Pearl Harbor brought the United States into the war in December 1941; the historian Robert Simon calculates that Grainger made a total of 274 charity appearances during the war years, many of them at Army and Air force camps.[94] In 1942 a collection of his Kipling settings, the *Jungle Book* cycle, was performed in eight cities by the choir of the Gustavus Adolphus College from St. Peter, Minnesota.[97]

[edit] Postwar decline

Exhausted from his wartime concerts routine, Grainger spent much of 1946 on holiday in Europe. He was experiencing a sense of career failure; in 1947, when refusing the Chair of Music at Adelaide University, he wrote: "If I were 40 years younger, and not so crushed by defeat in every branch of music I have essayed, I am sure I would have welcomed such a chance".[98] In January 1948 he

conducted the premiere of his wind band setting of "The Power of Rome and the Christian Heart", written for the Goldman Band to celebrate the 70th birthday of its founder. Afterwards, Grainger denigrated his own music as "commonplace" while praising Darius Milhaud's Suite Française, with which it had shared the programme.[99]

On 10 August 1948, Grainger appeared at the London Proms, playing the piano part in his Suite on Danish Folksongs with the London Symphony Orchestra under Basil Cameron. On 18 September he attended the Last Night of the Proms, standing in the promenade section for Delius's Brigg Fair.[100] Over the next few years several friends died: Gardiner in 1950, Quilter and Karen Holten in 1953. In October 1953 Grainger was operated on for abdominal cancer; his fight against this disease would last for the rest of his life.[101] He continued to appear at concerts, often in church halls and educational establishments rather than major concert venues.[9] In 1954, after his last Carnegie Hall appearance, Grainger's long promotion of Grieg's music was recognised when he was awarded the St. Olav Medal by King Haakon of Norway.[102] However, a growing bitterness was becoming evident in his writings and correspondence; in a letter to his lifelong friend, the Danish composer Herman Sandby, he bemoaned the continuing ascendancy in music of the "German form", and asserted that "all my compositional life I have been a leader without followers".[102]

After 1950 Grainger virtually ceased to compose. His principal creative activity in the last decade of his life was his work with Burnett Cross, a young physics teacher, on free music machines. The first of these was a relatively simple device controlled by an adapted pianola.[103] Next was the "Estey-reed tone-tool", a form of giant harmonica which, Grainger expectantly informed his stepdaughter Elsie in April 1951, would be ready to play free music "in a few weeks".[104] A third machine, the "Cross-Grainger Kangaroo-pouch", was completed by 1952. Developments in transistor technology encouraged Grainger and Cross to begin work on a fourth, entirely electronic machine, which was incomplete when Grainger died.[8][103]

In September 1955 Grainger made his final visit to Australia, where he spent nine months organising and arranging exhibits for the Grainger Museum. He refused to consider a "Grainger Festival", as suggested by the Australian Broadcasting Commission, because he felt that his homeland had rejected him and his music. Before leaving Melbourne, he deposited in a bank a parcel that contained an essay and photographs related to his sex life, not to be opened until 10 years after his death.[105]

[edit] Last years

By 1957 Grainger's physical health had markedly declined, as had his powers of concentration.[106] Nevertheless, he continued to visit Britain regularly; in May of that year he made his only television appearance, in a BBC "Concert Hour" programme when he played "Handel in the Strand" on the piano. Back home, after further surgery he recovered sufficiently to undertake a modest winter concerts season.[107] On his 1958 visit to England he met Benjamin Britten, the two having previously maintained a mutually complimentary correspondence.[108] He agreed to visit Britten's Aldeburgh Festival in 1959, but was prevented by illness. Sensing that death was drawing near, he made a new will, bequeathing his skeleton "for preservation and possible display in the Grainger Museum". This wish was not carried out.[109]

Through the winter of 1959-60 Grainger continued to perform his own music, often covering long distances by bus or train; he would not travel by air. On 29 April 1960 he gave his last public concert, at Dartmouth College in Hanover, New Hampshire, although by now his illness was affecting his concentration. On this occasion his morning recital went well, but his conducting in the afternoon was, in his own words, "a fiasco".[110][111] Subsequently confined to his home, he continued to revise his music and arrange that of others; in August he informed Elsie that he was working on an adaptation of one of Cyril Scott's early songs.[112] His last letters, written from hospital in December 1960 and January 1961, record attempts to work, despite failing eyesight and hallucinations: "I have been trying to write score for several days. But I have

not succeeded yet." [113]

Grainger died in the White Plains hospital on 20 February 1961, at the age of 78. His body was flown to Adelaide where, on 2 March, he was buried in the Aldridge family vault in the West Terrace Cemetery, alongside Rose's ashes. [8] Ella survived him by 18 years; in 1972, aged 83, she married a young archivist, Stewart Manville. She died at White Plains on 17 July 1979. [2] [114]

Grainger's own works fall into two categories: original compositions and folk music arrangements. Besides these, he wrote many settings of other composers' works. [8] [9] Despite his conservatory training he rebelled against the disciplines of the central European tradition, largely rejecting conventional forms such as symphony, sonata, concerto and opera. With few exceptions his original compositions are miniatures, lasting between two and eight minutes. Only a few of his works originated as piano pieces, though in due course almost all of them were, in his phrase, "dished up" in piano versions. [9]

The conductor John Eliot Gardiner describes Grainger as "a true original in terms of orchestration and imaginative instrumentation", whose terseness of expression is reminiscent in style both of the 20th century Second Viennese School and the Italian madrigalists of the 16th and 17th centuries. [115] Malcolm Gillies, a Grainger scholar, writes of Grainger's style that "you know it is 'Grainger' when you have heard about one second of a piece". [116] The music's most individual characteristic, Gillies argues, is its texture â ^ "the weft of the fabric", according to Grainger. [117] Different textures are defined by Grainger as "smooth", "grained" and "prickly". [9]

Grainger was a musical democrat; he believed that in a performance each player's role should be of equal importance. His elastic scoring technique was developed to enable groups of all sizes and combinations of instruments to give effective performances of his music. Experimentation is evident in Grainger's earliest works; irregular rhythms based on rapid changes of time signature were employed in Love Verses from "The Song of Solomon" (1899), and Train Music (1901), long before Stravinsky adopted this practice. [4] In search of specific sounds Grainger employed unconventional instruments and techniques: solovoxes, theremins, marimbas, musical glasses, harmoniums, banjos, and ukuleles. [109] [118] In one early concert of folk music, Quilter and Scott were conscripted as performers, to whistle various parts. [119] In "Random Round" (1912â ^ 14), inspired by the communal music-making he had heard in the Pacific Islands on his second Australasian tour, Grainger introduced an element of chance into performances; individual vocalists and instrumentalists could make random choices from a menu of variations. [9] This experiment in "aleatory" composition presaged by many decades the use of similar procedures by avant-garde composers such as Berio and Stockhausen. [120]

The brief "Sea Song" of 1907 was an early attempt by Grainger to write "beatless" music. This work, initially set over 14 irregular bars and occupying about 15 seconds of performing time, [121] was a forerunner of Grainger's free music experiments of the 1930s. Grainger wrote: "It seems to me absurd to live in an age of flying, and yet not be able to execute tonal glides and curves". The idea of tonal freedom, he said, had been in his head since as a boy of eleven or twelve he had observed the wave-movements in the sea. "Out in nature we hear all kinds of lovely and touching "free" (non-harmonic) combinations of tones; yet we are unable to take up these beauties ... into the art of music because of our archaic notions of harmony". [90] In a 1941 letter to Scott, Grainger acknowledged that he had failed to produce any large-scale works in the manner of a Bach oratorio, a Wagner opera or a Brahms symphony, but excused this failure on the grounds that all his works prior to the mid-1930s had been mere preparations for his free music. [122]

As a student, Grainger had learned to appreciate the music of Grieg, and came to regard the Norwegian as a paragon of Nordic beauty and greatness. Grieg in turn described Grainger as a new way forward for English composition, "quite different from Elgar, very original". After a lifetime interpreting Grieg's works, in 1944 Grainger began adapting the Norwegian's E minor Piano Sonata, Op. 7 as a "Grieg-Grainger Symphony", but abandoned the project after writing

16 bars of music. By this time, Grainger acknowledged that he had not fulfilled Grieg's high expectations of him, either as a composer or as a pianist. He also reflected on whether it would have been better, from the point of view of his development as a composer, had he never met the Griegs, "sweet and dear though they were to me".[123]

Grainger was known for his musical experimentation and did not hesitate to exploit the capabilities of the orchestra. *Train Music* was intended for 150 players and *Country Gardens* has some lush harmonic invention. Perhaps his most ambitious work was *The Warriors*, an 18 minute 'imaginary ballet' of frenzied 'danceable music', entrusted to a huge orchestral ensemble incorporating a large 'tuneful percussion' mixture alongside at least three pianos â ^ in one performance, Grainger used nineteen pianos with thirty pianists â ^ to be played by "exceptionally strong vigorous players".[124]

[edit] Legacy

Grainger considered himself an Australian composer who, he said, wrote music "in the hopes of bringing honor and fame to my native land".[125] However, much of Grainger's working life was spent elsewhere, and the extent to which he influenced Australian music, within his lifetime and thereafter, is debatable.[126] His efforts to educate the Australian musical public in the mid-1930s were indifferently received, and did not attract disciples;[127] writing in 2010, the academic and critic Roger Covell identifies only one significant contemporary Australian musician â ^ the English-born horn player, pianist and conductor David Stanhope â ^ working in the Grainger idiom.[126] In 1956, the suggestion by the composer Keith Humble that Grainger be invited to write music for the opening of the 1956 Summer Olympics in Melbourne had been rejected by the organisers of the Games.[105]

Grainger was a life-long atheist and believed he would only endure in the body of work he left behind.[128] He took an unusual course of action to ensure that survival by establishing a personal museum dedicated to his own life. The Grainger Museum was given little attention before the mid-1970s;[9] it was initially regarded as evidence either of an over-large ego or of extreme eccentricity.[129] Since then the University of Melbourne's commitment to the museum has, Covell asserts, "rescued [it] permanently from academic denigration and belittlement".[129] Its vast quantities of materials have been used to investigate not only Grainger's life and works, but those of contemporaries whom Grainger had known: Grieg, Delius, Scott and others.[130] The Grainger home at 7 Cromwell Place, White Plains, is now the Percy Grainger Library and is a further repository of memorabilia and historic performance material, open to researchers and visitors.[9][131]

In Britain, Grainger's main legacy is the revival of interest in folk music. His pioneering work in the recording and setting of folksongs greatly influenced the following generation of English composers; Benjamin Britten acknowledged the Australian as his master in this respect.[132] After hearing a broadcast of some Grainger settings, Britten reportedly declared that these "[knocked] all the Vaughan Williams and R. O. Morris arrangements into a cocked hat".[133] In the United States, Grainger left a strong educational legacy through his involvement, over 40 years, with high school, summer school and college students. Likewise, his innovative approaches to instrumentation and scoring have left their mark on modern American band music;[9] Timothy Reynish, a conductor and teacher of band music in Europe and America, has described him as "the only composer of stature to consider military bands the equal, if not the superior, in expressive potential to symphony orchestras." [134] Grainger's attempts to produce "free music" by mechanical and later electronic means, which he considered his most important work, produced no follow-up; they were quickly overtaken and nullified by new technological advances. Covell nevertheless remarks that in this endeavour, Grainger's dogged resourcefulness and ingenious use of available materials demonstrate a particularly Australian aspect of the composer's character â ^ one of which Grainger would have been proud.[135]

[edit] Assessment

In 1945 Grainger devised an informal ratings system for composers and musical styles, based on criteria that included originality, complexity and beauty. Of forty composers and styles, he ranked himself equal ninth â ^ behind Wagner and Delius, but well ahead of Grieg and Tchaikovsky.[123] Nevertheless, in his later years he frequently denigrated his career, for example writing to Scott: "I have never been a true musician or true artist".[136] His failure to be recognised as a composer for anything beyond his popular folk-song arrangements was a source of frustration and disappointment;[137] for years after his death the bulk of his output remained largely unperformed.[138] From the 1990s an increase in the number of Grainger recordings has brought a revival of interest in his works, and has enhanced his reputation as a composer.[2] An unsigned tribute published on the Gramophone website in February 2011 to commemorate the 50th anniversary of Grainger's death opined that "though he would never be put on a pedestal to join the pantheon of immortals, he is unorthodox, original and deserves better than to be dismissed by the more snooty arbiters of musical taste".[109]

Of Grainger the pianist, The New York Times critic Harold Schonberg wrote that his unique style was expressed with "amazing skill, personality and vigor".[139] The early enthusiasm which had greeted his concert appearances became muted in later years, and reviews of his performances during the final ten years of his life were often harsh.[140] However, Britten regarded Grainger's late recording of the Grieg concerto, from a live performance at Aarhus in 1957, as "one of the noblest ever committed to record" â ^ despite the suppression of the disc for many years, because of the proliferation of wrong notes and other faults.[141] Brian Allison from the Grainger Museum, referring to Grainger's early displays of artistic skills, has speculated that had John Grainger's influence not been removed, "Percy Aldridge Grainger may today be remembered as one of Australia's leading painters and designers, who just happened to have a latent talent as a pianist and composer".[142] The ethnomusicologist John Blacking, while acknowledging Grainger's contribution to social and cultural aspects of music, nevertheless writes that if the continental foundation of Grainger's musical education had not been "undermined by dilettantism and the disastrous influence of his mother, I am sure that his ultimate contribution to the world of music would have been much greater".[143]

[edit] Recordings

Between 1908 and 1957 Grainger made numerous recordings, usually as pianist or conductor, of his own and other composers' music. His first recordings, for The Gramophone Company Ltd (later HMV), included the cadenza to Grieg's piano concerto; he did not record a complete version of this work on disc until 1945. Much of his recording work was done between 1917 and 1931, under contract with Columbia. At other times he recorded for Decca (1944â ^45 and 1957), and Vanguard (1957). Of his own compositions and arrangements, "Country Gardens", "Shepherd's Hey" and "Molly on the Shore" were recorded most frequently; in recordings of other composers, piano works by Bach, Brahms, Chopin, Grieg, Liszt and Schumann figure most often.[144] Grainger's complete 78 rpm solo piano recordings are now available on compact disc as a CD box set on APR records in transfers made by Ward Marston.[145] During his association with the Duo-Art company between 1915 and 1932, Grainger made around 80 piano rolls of his own and others' music, many of which have subsequently been transferred to CD, using a wooden robot designed to play a concert grand piano via an array of precision mechanical fingers and feet.[146][147][148] This reproduction system allowed Grainger to make a posthumous appearance in the Albert Hall, London, during the 1988 last night of the Proms as soloist with the BBC Symphony Orchestra in Grieg's Piano Concerto.[149]

Since Grainger's death, recordings of his works have been undertaken by many artists and issued under many different labels. In 1995 Chandos Records began to compile a complete recorded edition of Grainger's original compositions and folk settings.[150] Of 25 anticipated volumes, 19 had been completed as of 2010;[151] these were issued as a CD boxed set in 2011, to mark the 50th anniversary of the composer's death.[152]

[edit] Media portrayals

Percy Grainger has been portrayed on screen more than once. In *Song of Summer*, a 1968 Ken Russell film mainly about Frederick Delius and Eric Fenby, he was played by David Collings. *Passion* (also known as *Passion: The Story of Percy Grainger*) was a 1999 Australian biopic about some episodes in Grainger's life during the early part of his career. It starred Richard Roxburgh as the composer and Barbara Hershey as Rose Grainger.

[edit] Notes and references

Notes

- [^] Although most sources give 1855 as the birth year, the Grainger Museum states that 1854 is the correct year.[1]
- [^] The correspondence was conducted largely in Danish, at which Grainger was fluent. His first letter to Holten, dated 12 August 1905, begins "Dear Miss Holten"; by the end of the year she is "My dear Karen". During their long separations Grainger's letters become a diary of his activities.[44]
- [^] There is no evidence up to this time that Grainger could play the saxophone,[53] but in an official listing of the band's personnel as of April 1918 he is listed as a saxophone soloist.[54]
- [^] Some of Grainger's earliest published letters contain anti-Semitic comments, for example to Karen Holten in 1905.[77] He later asserted that the Jewish race was less capable of producing good music than the Nordic races,[78] and his letter to Quilter of 25 February 1939 is cited by Gillies and Pear as an example of his racial intolerance.[76][79]
- [^] In April 1945 Grainger declined an honorary doctorate from McGill University in Montreal, on the grounds that having had only three months' formal schooling, his music "must be regarded as a product of non-education".[85]

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- ^{a b} Bird, pp. 2â ^6
- ^{a b c d e f} Simon, pp. 2â ^3
- [^] Bird, p. 9
- [^] Bird, pp. 14â ^15
- [^] Bird, p. 11
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- [^] Bird, p. 13
- [^] Bird, pp. 20â ^22
- [^] Bird, p. 23
- [^] Bird, pp. 24â ^25
- ^{a b c} Scott, pp. 51â ^54
- [^] Bird, pp. 26â ^29
- [^] Bird, p. 35
- ^{a b c} Bird, pp. 39â ^41
- ^{a b} Bird, pp. 42â ^43
- [^] Bird, pp. 63â ^65

^ Bird, pp. 66 and 73
 ^ Pear ("Grainger: The Formative Years"), p. 6
 ^ Bird, p. 69
 ^ Bird, p. 81
 ^ Bird, pp. 83â ^88
 ^ a b Thwaites (ed.), p. xx
 ^ Dreyfus (ed.), p. 2
 ^ Bird, p. 79
 ^ a b c Simon, pp. 5â ^6
 ^ Tall, pp. 55â ^56
 ^ Bird, p. 102
 ^ a b Carley, pp. 33â ^34
 ^ Palmer, pp. 79â ^82
 ^ Carley, pp. 49â ^50
 ^ Bird, p. 116
 ^ a b Gillies, Malcolm; Pear, David (Autumn 2007). "Great Expectations: Grieg and Granger". *The Musical Times* 148 (1900): pp. 7â ^9.
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 ^ Bird, p. 117
 ^ Tall, p. 63
 ^ Ould, p. 26
 ^ Thwaites (ed.), p. xxi
 ^ Bird, p. 144
 ^ Dreyfus, pp. 454, 458
 ^ Bird, p. 147
 ^ Dreyfus, p. xiv
 ^ Dreyfus, pp. 47, 54, 55 and others
 ^ a b Bird, pp. 148â ^49
 ^ Dreyfus, p. 492
 ^ Bird, pp. 150â ^51
 ^ Gillies and Pear (eds), p. 13
 ^ Bird, p. 152
 ^ Gillies and Pear (eds), pp. 35â ^39
 ^ Gillies and Pear (eds), p. 36
 ^ Bird, p. 158
 ^ Bird, p. 159
 ^ Gillies and Pear (eds), pp. 132â ^33
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 ^ Foreman ("Miscellaneous Works"), pp. 137â ^38
 ^ a b Simon, p. 7
 ^ Gillies and Pear (eds), p. xv
 ^ Bird, p. 162
 ^ Tan, p. 15
 ^ Bird, pp. 167â ^68
 ^ Gillies and Pear (eds), p. xv
 ^ Bird, p. 166
 ^ Bird, pp. 163â ^64
 ^ Fairfax, pp. 75â ^77
 ^ Bird, p. 170
 ^ Gillies and Pear (eds), p. 52
 ^ Bird, pp. 173â ^74
 ^ Bird, p. 175
 ^ Fenby, pp. 74â ^75
 ^ Bird, p. 183
 ^ Simon, p. 9
 ^ Ould, p. 25
 ^ Bird, pp. 279â ^81
 ^ Bird, p. 53. See also Gillies and Pear (eds), p. 107
 ^ a b Gillies and Pear (eds), pp. 4â ^6
 ^ Dreyfus (ed.), p. 54

^ Pear ("Grainger the Social Commentator"), p. 36
 ^ Gillies and Pear (eds), pp. 156-163
 ^ Bird, pp. 194-196
 ^ Gillies and Pear (eds), p. xix
 ^ Bird, pp. 200-201
 ^ Gillies and Pear (eds), pp. 94-100
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 ^ Bird, pp. 206-207
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 ^ Simon, p. 12
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 ^ a b Bird, pp. 214-215
 ^ a b Simon, p. 11
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 ^ Bird, pp. 247-248
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[edit] External links

Persondata

Name

Grainger, Percy

Alternative names

Short description

Australian-born composer

Date of birth
8 July 1882
Place of birth
Brighton, Melbourne
Date of death
20 February 1961
Place of death
White Plains, New York
Richard Cordray
Director of the Consumer Financial Protection Bureau
Incumbent
Assumed office
January 4, 2012
President
Barack Obama
Preceded by
Raj Date (Special Adviser)
49th Attorney General of Ohio
In office
January 8, 2009 – January 9, 2011
Governor
Ted Strickland
Preceded by
Nancy Rogers
Succeeded by
Mike DeWine
46th Treasurer of Ohio
In office
January 8, 2007 – January 7, 2009
Governor
Ted Strickland
Preceded by
Jennette Bradley
Succeeded by
Kevin Boyce
Treasurer of Franklin County
In office
December 9, 2002 – January 8, 2007
Preceded by
Wade Steen
Succeeded by
Ed Leonard
Solicitor General of Ohio
In office
1993 – 1994
Governor
George Voinovich
Preceded by
Position established
Succeeded by
Jeffrey Sutton
Member of the Ohio House of Representatives
for the 33rd District
In office
January 7, 1991 – December 31, 1992
Preceded by
Don Gilmore
Succeeded by
Priscilla Mead
Personal details

Born

(1959-05-03) May 3, 1959 (age 53)Columbus, Ohio, U.S.

Political party

Democratic Party

Spouse(s)

Peggy Cordray

Children

Danny

Holly

Alma mater

Michigan State UniversityUniversity of OxfordUniversity of Chicago

Website

Campaign website

Richard Cordray (born May 3, 1959) is an American Democratic Party politician, who is serving as the Director of the United States Consumer Financial Protection Bureau, which officially began operating in July 2011.[1] Prior to his appointment in January 2012, Cordray served as the Attorney General of Ohio.

On July 17, 2011, President Barack Obama announced he would nominate Cordray to lead the United States Consumer Financial Protection Bureau. On January 4, 2012, the White House announced that it would make a recess appointment of Cordray to the post.[2][3][4]

Cordray was elected Attorney General of Ohio in November 2008 to fill the remainder of the unexpired term ending January 2011. On November 2, 2010, Cordray lost his bid for re-election to former Lt. Governor and U.S. Senator Mike DeWine. Prior to his Attorney General position, Cordray served as the Ohio State Treasurer and as treasurer of Franklin County, Ohio. He has also previously served as a member of the Ohio House of Representatives (1991â ^1993) and as the first Ohio state solicitor (1993â ^1994).

Cordray was a Marshall Scholar at Oxford University, 1981â ^83. Later, he was editor-in-chief of the University of Chicago Law Review and subsequently served as a law clerk for Judge Robert Bork on the U.S. Court for the District of Columbia Circuit (1986 - 87 term), and after that, Justice Anthony Kennedy of the Supreme Court of the United States. In 1987 he became an undefeated five-time Jeopardy! champion.[5]

After the 1990 census, the district he represented in the Ohio House of Representatives in 1992 was merged with another district held by a Democratic incumbent. Cordray decided to run for a United States House of Representatives seat but did not win the election. The following year he was appointed by the Ohio attorney general as the first Ohio state solicitor. His experience as Solicitor led to his appearance before the United States Supreme Court to argue six cases, where he had previously clerked. Following Republican victories in Ohio statewide elections in 1994, Cordray left his appointed position and entered the private practice of law. He was elected Franklin County treasurer in 2002. While in private practice he unsuccessfully ran for Ohio attorney general in 1998 and United States senator in 2000. Cordray won re-election as Franklin County treasurer before being elected state treasurer in 2006.

[edit] Early life, education, and early law career

Cordray was raised in Grove City, Ohio, where he attended public schools. While attending Grove City High School, Cordray became a champion on the high school quiz show In The Know and worked for minimum wage at McDonald's.[6][7] He graduated from high school in 1977 as co-valedictorian of his class.[8] His first job in politics was as an intern for United States Senator John Glenn as a junior at Michigan State University's James Madison College.[6] Cordray earned Phi Beta Kappa honors and graduated summa cum laude with a BA in Legal & Political Theory in 1981. As a Marshall Scholar, he earned an MA with first class honours in Economics from the University of Oxford and earned a Varsity Blue in basketball in 1983.[6] At the University of Chicago Law School, where he earned his Juris Doctor with honors in 1986, he served as editor-in-chief of the University of Chicago Law Review.[6][9] After starting

work as a law clerk at the U.S. Supreme Court, he came back to his high school to deliver the commencement speech for the graduating class in 1988.[8]

Cordray began his career clerking for Judge Robert Bork and Supreme Court associate justices Byron White and Anthony Kennedy.[6][10] After clerking for White in 1987â ^1988, he was hired by the international law firm Jones Day to work in its Cleveland office.[9]

[edit] Early political career (1990-1995)

He also taught various courses at The Ohio State University Moritz College of Law and at Georgetown University.[6]

[edit] Ohio House of Representatives

In 1990 Cordray ran for an Ohio State House of Representatives seat, in the 33rd District (southern and western Franklin County), against six-term incumbent Republican Don Gilmore.[11] Unopposed for the Democratic nomination,[12] he defeated Gilmore by a 18,573â ^11,944 (61â ^39%) margin.[13]

As a state representative from 1991 to 1992, Cordray legislated against crime, on behalf of the environment, and for the protection of children and families.[6]

[edit] 1992 congressional election

In 1991 the state Apportionment Board, controlled by a 3â ^2 Republican majority despite the party's 61â ^38 minority in the state House of Representatives,[14] redrew state legislative districts following the results of the 1990 Census, in the hope of retaking control of the state House.[15] The new boundaries created nine districts each with two resident incumbent Democrats, pairing Cordray with the twenty-two-year incumbent Mike Stinziano.[16][17] Unable to be elected in another district due to a one-year residency requirement, Cordray opted not to run for re-election.[18] Instead, he decided to run for Ohio's 15th congressional district in the 1992 U.S. House of Representatives elections, a seat being vacated by retiring thirteen-term Republican Chalmers Wylie, and being challenged by Republican Deborah D. Pryce.

Cordray won the Democratic nomination over Bill Buckel by a 18,731â ^5,329 (78â ^22%) margin,[19] following the withdrawal of another candidate, Dave Sommer.[20][21] Cordray's platform included federal spending cuts, term limits for Congress and a line-item veto for the president.[22] When Pryce announced that she would vote to support abortion rights, Linda S. Reidelbach entered the race as an independent.[23] Thus, the general election was a three-way affair, with Pryce taking a plurality of 110,390 votes (44.1%), Cordray taking 94,907 votes (37.9%) and Linda Reidelbach taking 44,906 votes (17.9%).[24]

[edit] Ohio Solicitor General

While in private practice in 1993, Cordray co-wrote a legal brief for the Anti-Defamation League, in a campaign supported by Ohio's attorney general, for the reinstatement of Ohio's hate crime laws. This was considered by the U.S. Supreme Court, but not ruled on because of its similarity to a previous Wisconsin ruling.[25]

In 1993 the government of Ohio created the office of state solicitor general to handle the state's appellate work. The state solicitor, appointed by the Ohio attorney general, is responsible for cases that are to be argued before the Ohio Supreme Court and the United States Supreme Court. Until 1998, the Solicitor worked without any support staff.[26] Cordray, who had earlier worked for a summer in the office of the United States solicitor general,[27] was the first Solicitor to be appointed, in September 1993.[27] He held the position until he resigned after Ohio Attorney General Lee Fisher was defeated by Betty Montgomery in 1994.[28][29] His cases before the Supreme Court included *Wilson v. Layne* (526 U.S. 603 (1999)) and *Hanlon v. Berger* (526 U.S. 808 (1999)).[6] Though he lost his first case, he won his second case, which garnered a substantial amount of media attention for its consideration of the constitutionality of media ride-alongs with police.[28] Other cases included *Household Credit Services v. Pfennig* (541 U.S. 232 (2004)), *Brown v. Legal Foundation of Washington* (538 U.S. 216 (2003)), *Demore v. Kim* (538 U.S. 510 (2003)), and *Groh v. Ramirez* (540 U.S. 551 (2004)).

Cordray contested the Ku Klux Klan's right to erect a cross at the Ohio

Statehouse after the state's Capitol Square Review and Advisory Board denied the Klan's request during the 1993 Christmas holiday. He argued that the symbolic meaning of the cross was different from the Christmas tree and menorah, which the state permits. The Klan prevailed in the 6th U.S. Circuit Court of Appeals on December 21, 1993, and erected a 10-foot (3 m) cross the following day.[30][31] The same board denied the Klan a permit to rally on Martin Luther King Day (January 15, 1994) due to the group's failure to pay a \$15,116 bill from its Oct. 23 rally and its refusal to post a bond to cover expenses for the proposed rally.[32] When the same 6th U.S. Circuit Court of Appeals overturned the decision to deny the 1994 permit, the state chose not to appeal.[33] The following year the Klan again applied to erect a cross for the Christmas holiday season, and the 6th U.S. Circuit Court of Appeals concurred with the prior ruling.[34] The United States Supreme Court did not agree to hear arguments on the topic until a few weeks after Cordray resigned from his solicitor general position.[35] After his resignation in 1994 he several times represented the federal government in the U.S. Supreme Court: two of Cordray's appearances before were by appointment of the Democratic Bill Clinton Justice Department and two were by the Republican George W. Bush Justice Department.[36]

Cordray was granted a ruling by the Ohio Supreme Court that lower courts could not grant a stay of execution for a death row inmate. At the same time, Fisher, Cordray's boss, sought a referendum to mandate that appeals in death penalty cases be made directly to the Supreme Court.[37] In 1994 the 6th U.S. Circuit Court of Appeals in *Steffen v. Tate* (39 F.3d 622 1994) limited death row inmates to a single federal appeal and said that federal courts cannot stay an execution if the case is still in a state court.[38]

[edit] Latter political career (1995-2007)

In early 1996, Cordray was elected to the Ohio Democratic Party Central Committee from the 15th district by a 5,472 to 1,718 margin over John J. Kulewicz.[39]

In late 1996 Cordray, who was in private practice at the time, was a leading contender and finalist for a United States Attorney position during the second term of the Clinton Administration, along with Kent Markus and Sharon Zealey.[40][41] Zealey was eventually selected.[42]

[edit] 1998 Ohio Attorney General election

During the 1998 election for Ohio attorney general, Cordray ran unopposed in the Democratic primary[43] but was defeated, 62% to 38%, by one-term Republican incumbent Betty Montgomery.[44][45]

[edit] 2000 U.S. Senate election

Cordray entered the U.S. Senate elections in a race that began as a three-way contest for the Democratic nomination to oppose first-term Republican incumbent Mike DeWine. The three-way race was unusual since the three candidates (Cordray, Rev. Marvin McMickle, and Ted Celeste) were encouraged to campaign together in order to promote name recognition, conserve resources and lessen infighting.[46] Ohio Democratic party leaders believed Cordray was better suited for an Ohio Supreme Court seat and urged him to drop out of the Senate race. Despite the Ohio Democrats not endorsing any candidate in the primary election,[47] the entry of Dan Radakovich as a fourth competitor,[48] and the anticipated entry of former Mayor of Cincinnati and television personality Jerry Springer, Cordray persisted in his campaign.[49] Celeste, the younger brother of former Ohio governor Dick Celeste,[50] won with 369,772 votes. He was trailed by McMickle (the only black Senate candidate in the country in 2000)[48] with 204,811 votes, Cordray with 200,157, and Radakovich with 69,002.[51]

[edit] Franklin County Treasurer

Cordray was unopposed in the May 7, 2002, primary election for the Democratic nomination as Franklin County treasurer.[52] He defeated Republican incumbent Wade Steen, who had been appointed in May 2001 to replace Bobbie M. Hall.[53] The election was close, unofficially 131,199 to 128,677 (50.5% to 49.5%), official margin of victory 3,232.[54][55] Cordray was the first Democrat to hold the

position since 1977,[56] and he assumed office on December 9, 2002, instead of after January 1 because he was filling Hall's unexpired term.[57]

In the 2004 race for re-election, the Franklin County Republican party made no endorsement,[58] but Republican Jim Timko challenged Cordray.[59] Cordray defeated him and was elected to a four-year term by a 272,593â ^153,625 (64%â ^36%) margin.[60][61] As Franklin County treasurer, Cordray focused on four major initiatives: collection of delinquent tax revenue through a tax lien certificate sale, creation of a land bank, personal finance education, and the development of a community outreach program.[62] He managed a portfolio that averages \$650 million and consistently beat its benchmarks, and he set new records for delinquent tax collection in Franklin County, which was the only Ohio county with a AAA credit rating.[63][64] He also served as president of the Board of Revision and chair of the Budget Commission.[65] In 2005, Cordray was named the national "County Leader of the Year" by American City & County magazine.[66]

[edit] Statewide office (2007-2011)

[edit] Ohio Treasurer

In the 2006 Democratic party primary election for state treasurer he was set to face Montgomery County Treasurer Hugh Quill who filed an entry,[67] but in the end, he was unopposed.[68] He defeated Republican nominee Sandra O'Brien for state treasurer in the 2006 election. Cordray succeeded Jennette Bradley in a near-statewide sweep by the Democratic Party.[60] Cordray noted that when he assumed statewide office, Ohio was challenged with restoring public trust after the misdeeds of former Ohio Governor Bob Taft. Referring to what in a similar way would be required to follow Ohio Attorney General Marc Dann and his interim successor Nancy Rogers he said: "... we have been patiently rebuilding the public trust there [in the state government] and I think it would be a very similar task there in the Attorney General's office." [69][70]

[edit] Ohio Attorney General

[edit] 2008 election

Cordray announced his 2008 candidacy for Ohio state attorney general on June 11, 2008. He was endorsed by Ohio Governor Ted Strickland.[71][72] The vacancy in the office of the attorney general was created by the May 14, 2008, resignation of Marc Dann who was embroiled in a sex scandal.[72][73][74] Several leading Republican party contenders such as Montgomery, Jim Petro, DeWine, Maureen O'Connor, and Rob Portman declined to enter the race.[72][75] Cordray's opponents in the race were Michael Crites (Republican), and Robert M. Owens (Independent).[76] Cordray had a large financial advantage over his opponents with approximately 30 times as much campaign financing as Crites.[77] Crites' campaign strategies included attempts to link Cordray with Dann's association the The Columbus Dispatch called into question[78] and promoting himself as having more years of prosecutorial experience.[79] Cordray asserted that he managed the state's money safely despite the turbulence of the financial crisis of 2007â ^2008.[80][81]

Ohio statewide offices are regularly contested every four years in the midterm election years. 2008 is Class 2 senatorial election year, and Ohio is a state with class 1 and class 3 senators. Thus, the Attorney General race was the only non-presidential race in the 2008 election aside from contests for two seats on the Ohio Supreme Court. Cordray defeated Republican Mike Crites, 57%-38%.[82]

[edit] Tenure

Bank of America

In July 2009, Denny Chin, a judge on the United States district court for the Southern District of New York, granted lead plaintiff status to a group of five public pension funds for investor class-action lawsuits against the Bank of America Corporation over its acquisition of Merrill Lynch & Company. The claim is that Bank of America misled investors about Merrill's financial well-being prior to the January 1, 2009 acquisition despite awareness that Merrill was headed toward a significant loss that amounted to \$15.84 billion in its fourth quarter.[83] The suit also alleges that significant bonus payments were concealed.[84]

The curious dealings led to congressional hearings about why the merger commenced without any disclosures.[83] In September 2009, Cordray, on behalf of Ohio's largest public employee pension funds (State Teachers Retirement System of Ohio and the Ohio Public Employees Retirement System), the Teacher Retirement System of Texas and pension funds from Sweden and the Netherlands, filed suit alleging that Bank of America, its directors and four executives (Bank of America Chief Executive Kenneth Lewis, Bank of America Chief Financial Officer Joe Price, accounting chief Neil Cotty and former Merrill chairman and CEO John Thain) acted to conceal Merrill's growing losses from shareholders voted to approve the deal the prior December.[85]

Prior to the filing the five funds had filed individual complaints, but the September filing of an amended complaint joined the actions with Cordray representing the lead plaintiff.[85] The amended complaint includes details about conversations and communications between Bank of America and Merrill Lynch executives that were revealed in media reports, congressional testimony and investigations by the Securities and Exchange Commission.[84] The filing is an attempt to recover losses endured when Bank of America's share price fell after the transaction. The damages are sought from Bank of America, individual executives, the bank's board of directors, including any insurers that cover directors' legal liabilities.[85] Among the specifics of the claim are that Bank of America agreed to allow Merrill Lynch to pay as much as \$5.8 billion in undisclosed year-end discretionary bonuses to executives and employees and that Bank of America and Merrill Lynch executives were aware of billions of dollars in losses suffered by Merrill Lynch in the two months before the merger vote but failed to disclose them.[84]

Bid rigging case

In April 2010, he reached a 1 billion dollar settlement with American International Group (AIG), one of four remaining named defendants (along with Marsh & McLennan, Hartford Financial Services and Chubb Corp.), in a 2007 antitrust case regarding business practices between 2001 and 2004. The settlement is to be divided among 26 Ohio universities, cities and schools. Zurich Financial Services settled in 2006. Cordray believes that Marsh was the organizing company for the illegal practices and notes that a trial could commence in 2011. AIG admitted no wrongdoing and that the settlement was to avoid risks and prolonged expenses.[86]

[edit] 2010 election

On November 2, 2010, Cordray lost his re-election bid to former U.S. senator Mike DeWine by two points.[87][88][89]

Cordray has repeatedly been mentioned as a potential 2014 candidate for Governor of Ohio[90][91] and was recently rumored to be associated with a failed attempt to take over the leadership of the Ohio Democratic Party.[92][93][94]

[edit] Consumer Financial Protection Bureau (2012âˆ™present)

On Wednesday, December 15, 2010, Special Advisor to President Barack Obama, Elizabeth Warren announced that she had selected Richard Cordray to lead the enforcement arm of the newly-created United States Consumer Financial Protection Bureau (CFPB). She added that "Richard Cordray has the vision and experience to help us build a team that ensures every lender in the marketplace is playing by the rules." In announcing his appointment to this position Cordray also stated that he intends to once again, run for statewide office in Ohio in 2014.[95][96][97] Cordray described the opportunity to The Wall Street Journal as a chance to resume "...in many ways doing on a 50-state basis the things I cared most about as a state attorney general, with a more robust and a more comprehensive authority." [98]

On July 17, Cordray was selected over Warren as the head of the entire CFPB.[99] However, his nomination was immediately in jeopardy because 44 Senate Republicans had previously vowed to derail any nominee in order to push for a decentralized structure to the organization. This was part of a pattern of conflict between Republicans in the Senate and the Obama administration that had led to record numbers of blocked and failed nominations.[100][101] On July

21, Senator Richard Shelby wrote an op-ed article for The Wall Street Journal affirming continued opposition (that went back to a May 5 letter to the President) to a centralized structure, noting that both the Securities Exchange Commission and Federal Deposit Insurance Corporation had executive boards and that the CFPB should be no different.[102] Politico interpreted Shelby's statements as saying that Cordray's nomination was "Dead on Arrival".[103] In October, as the nomination continued to be on hold, the National Association of Attorneys General endorsed Cordray.[104] On December 8, 2011, the Senate failed to secure cloture on Cordray's nomination. The final vote was 53-45.[105]

On January 4, 2012, a White House communications director announced in a tweet that Obama would be giving Cordray a recess appointment to the post, bypassing the Senate and installing Cordray.[2][3][4] The move was criticized by Republican senators, who argued that Congress had not officially been in recess, and that Obama did not have the authority to bypass Congressional approval.[106] Writing for the New Republic, Timothy Noah, a supporter of Cordray, wrote, "As someone who strongly supported a recess appointment for Richard Cordray to run the Consumer Financial Protection Bureau, I'm confused as to why President Obama chose to act today... The trouble is that the Senate isn't in recess." [107] On January 24 2013, President Barack Obama renominated Cordray to the Director of the Consumer Financial Protection Bureau position.[108][109][110]

[edit] Personal life

Cordray was born in Columbus, Ohio,[69] the middle child between brothers Frank, Jr. and Jim.[6] He was married in 1992 to Margaret "Peggy" Cordray,[6][111] a law professor at Capital University Law School. The Cordrays have twins, a daughter and son, and currently reside near Grove City, Ohio.[69] Cordray's father, Frank Cordray, Sr., was living in Grove City at the time Cordray moved back to Columbus to work for the law firm of Jones Day.[9][14] His father retired as an Orient Developmental Center program director for mentally retarded residents after 43 years of service.[6] His mother, from Dayton, Ohio,[69] died in 1980.[6][9] She had been a social worker, teacher and founder of Ohio's first foster grandparent program for individuals with developmental disabilities.[6] Cordray carried the Olympic Flame through Findlay, Ohio, as part of the nationwide torch relay to the 1996 Summer Olympics in Atlanta, Georgia.[6] He has served as a member of the Advisory Board for the Friends of the Homeless and part of Al Gore's select group known as Leadership '98.[6]

[edit] Appearance on Jeopardy!

Cordray has the distinction of being an undefeated five-time champion and Tournament of Champions semifinalist on Jeopardy![112] In 1987, he won \$45,303 from the show, which he used to pay law school debt, to pay taxes and to buy a used car.[113] The total winnings came from \$40,303 in prize money during his five-contest streak and \$5,000 for a first round win on the Tournament of Champions.[114] His campaign for public office in 1990 precluded him from participating in the Super Jeopardy! elimination tournament of champions.[115] ABC, the network that carried the show, had a policy against political contestants appearing on the show (excluding Celebrity Jeopardy!).[113]

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[edit] External links

Persondata

Name

Cordray, Richard

Alternative names

Short description

American politician

Date of birth

May 3, 1959

Place of birth

Columbus, Ohio, U.S.

Date of death

Place of death

The history of Solidarity (Polish: Solidarność , pronounced [sɛˈliɕˈdarnɐˈtɕĩɕ] (listen)), a Polish non-governmental trade union, begins in August 1980, at the Lenin Shipyards (now Gdańsk Shipyards) at its founding by Lech Wałęsa and others. In the early 1980s, it became the first independent labor union in a Soviet-bloc country. Solidarity gave rise to a broad, non-violent, anti-communist social movement that, at its height, claimed some 9.4 million members. It is considered to have contributed greatly to the fall of communism.

Poland's communist government attempted to destroy the union by instituting martial law in 1981, followed by several years of political repression, but in the end was forced into negotiation. The Roundtable Talks between the

government and the Solidarity-led opposition resulted in semi-free elections in 1989. By the end of August 1989, a Solidarity-led coalition government had been formed, and, in December 1990, WaÅ Å sa was elected president. This was soon followed by the dismantling of the communist governmental system and by Poland's transformation into a modern democratic state. Solidarity's early survival represented a break in the hard-line stance of the communist Polish United Workers' Party (PZPR), and was an unprecedented event; not only for the People's Republic of Polandâ ~a satellite of the USSR ruled by a one-party communist regimeâ ~but for the whole of the Eastern bloc. Solidarity's example led to the spread of anti-communist ideas and movements throughout the Eastern Bloc, weakening communist governments. This process later culminated in the Revolutions of 1989.

In the 1990s, Solidarity's influence on Poland's political scene waned. A political arm of the "Solidarity" movement, Solidarity Electoral Action (AWS), was founded in 1996 and would win the Polish parliamentary elections in 1997, only to lose the subsequent 2001 elections. Thereafter, Solidarity had little influence as a political party, though it did become the largest trade union in Poland.

[edit] Preâ ~1980 roots

In the 1970s and 1980s, the initial success of Solidarity in particular, and of dissident movements in general, was fed by a deepening crisis within Soviet-influenced societies. There was declining morale, worsening economic conditions (a shortage economy), and growing stress from the Cold War.[1] After a brief boom period, from 1975 the policies of the Polish government, led by Party First Secretary Edward Gierek, precipitated a slide into increasing depression, as foreign debt mounted.[2] In June 1976, the first workers' strikes took place, involving violent incidents at factories in PÅ ock, Radom and Ursus.[3] When these incidents were quelled by the government, the worker's movement received support from intellectual dissidents, many of them associated with the Committee for Defense of the Workers (Polish: Komitet Obrony RobotnikÃ³w, abbreviated KOR), formed in 1976.[1][4] The following year, KOR was renamed the Committee for Social Self-defence (KSS-KOR).

On October 16, 1978, the Bishop of KrakÃ³w, Karol WojtyÅ a, was elected Pope John Paul II. A year later, during his first pilgrimage to Poland, his masses were attended by hundreds of thousands of his countrymen. The Pope called for the respecting of national and religious traditions and advocated for freedom and human rights, while denouncing violence. To many Poles, he represented a spiritual and moral force that could be set against brute material forces, he was a bellwether of change, and became an important symbolâ ~and supporterâ ~of changes to come.[5][6]

[edit] Early strikes (1980)

Strikes did not occur merely due to problems that had emerged shortly before the labor unrest, but due to governmental and economic difficulties spanning more than a decade. In July 1980, Edward Gierek's government, facing economic crisis, decided to raise prices while slowing the growth of wages. At once there ensued a wave of strikes and factory occupations,[1] with the biggest strikes taking place in the area of Lublin. The first strike started on July 8, 1980 in the State Aviation Works in Å'widnik. Although the strike movement had no coordinating center, the workers had developed an information network to spread news of their struggle. A "dissident" group, the Workers' Defence Committee (KOR), which had originally been set up in 1976 to organize aid for victimized workers, attracted small groups of working-class militants in major industrial centers.[1] At the Lenin Shipyard in GdaÅ sk, the firing of Anna Walentynowicz, a popular crane operator and activist, galvanized the outraged workers into action.[1][7]

On August 14, the shipyard workers began their strike, organized by the Free Trade Unions of the Coast (Wolne ZwiÅ zki Zawodowe WybrzeÅ a).[8] The workers were led by electrician Lech WaÅ Å sa, a former shipyard worker who had been dismissed in 1976, and who arrived at the shipyard late in the morning of August 14.[1] The strike committee demanded the rehiring of Walentynowicz and

WaÅ Å sa, as well as the according of respect to workers' rights and other social concerns. In addition, they called for the raising of a monument to the shipyard workers who had been killed in 1970 and for the legalization of independent trade unions.[9]

The Polish government enforced censorship, and official media said little about the "sporadic labor disturbances in GdaÅ sk"; as a further precaution, all phone connections between the coast and the rest of Poland were soon cut.[1] Nonetheless, the government failed to contain the information: a spreading wave of samizdats (Polish: bibuÅ a),[10] including Robotnik (The Worker), and grapevine gossip, along with Radio Free Europe broadcasts that penetrated the Iron Curtain,[11] ensured that the ideas of the emerging Solidarity movement quickly spread.

On August 16, delegations from other strike committees arrived at the shipyard.[1] Delegates (Bogdan Lis, Andrzej Gwiazda and others) together with shipyard strikers agreed to create an Inter-Enterprise Strike Committee (MiÅ dzyczajÅ adowy Komitet Strajkowy, or MKS).[1] On August 17 a priest, Henryk Jankowski, performed a mass outside the shipyard's gate, at which 21 demands of the MKS were put forward. The list went beyond purely local matters, beginning with a demand for new, independent trade unions and going on to call for a relaxation of the censorship, a right to strike, new rights for the Church, the freeing of political prisoners, and improvements in the national health service.[1]

Next day, a delegation of KOR intelligentsia, including Tadeusz Mazowiecki, arrived to offer their assistance with negotiations. A bibuÅ a news-sheet, SolidarnoÅÅ , produced on the shipyard's printing press with KOR assistance, reached a daily print run of 30,000 copies.[1] Meanwhile, Jacek Kaczmarski's protest song, Mury (Walls), gained popularity with the workers.[12]

On August 18, the Szczecin Shipyard joined the strike, under the leadership of Marian Jurczyk. A tidal wave of strikes swept the coast, closing ports and bringing the economy to a halt. With KOR assistance and support from many intellectuals, workers occupying factories, mines and shipyards across Poland joined forces. Within days, over 200 factories and enterprises had joined the strike committee.[1][7] By August 21, most of Poland was affected by the strikes, from coastal shipyards to the mines of the Upper Silesian Industrial Area (in Upper Silesia, the city of JastrzÅ bie-ZdrÅ³j became center of the strikes, with a separate committee organized there, see JastrzÅ bie-ZdrÅ³j 1980 strikes). More and more new unions were formed, and joined the federation.

Thanks to popular support within Poland, as well as to international support and media coverage, the GdaÅ sk workers held out until the government gave in to their demands. On August 21 a Governmental Commission (Komisja RzÅ dowa) including MieczysÅ aw Jagielski arrived in GdaÅ sk, and another one with Kazimierz Barcikowski was dispatched to Szczecin. On August 30 and 31, and on September 3, representatives of the workers and the government signed an agreement ratifying many of the workers' demands, including the right to strike.[1] This agreement came to be known as the August or GdaÅ sk agreement (Porozumienia sierpniowe).[7] Other agreements were signed in Szczecin (Szczecin Agreement (August 30), and JastrzÅ bie-ZdrÅ³j on September 3. It was called the JastrzÅ bie Agreement (Porozumienia jastrzebskie) and as such is regarded as part of the GdaÅ sk agreement. Though concerned with labor-union matters, the agreement enabled citizens to introduce democratic changes within the communist political structure and was regarded as a first step toward dismantling the Party's monopoly of power.[13] The workers' main concerns were the establishment of a labor union independent of communist-party control, and recognition of a legal right to strike. Workers' needs would now receive clear representation.[14] Another consequence of the GdaÅ sk Agreement was the replacement, in September 1980, of Edward Gierek by StanisÅ aw Kania as Party First Secretary.[15]

[edit] First Solidarity (1980â ^1981)

Encouraged by the success of the August strikes, on September 17 workers'

representatives, including Lech Wałęsa, formed a nationwide labor union, Solidarity (Niezależny Samorządny Związek Zawodowy (NSZZ) "Solidarność"). [1][7][16] It was the first independent labor union in a Soviet-bloc country. [17] Its name was suggested by Karol Modzelewski, and its famous logo was conceived by Jerzy Janiszewski, designer of many Solidarity-related posters. The new union's supreme powers were vested in a legislative body, the Convention of Delegates (Zjazd Delegatów). The executive branch was the National Coordinating Commission (Krajowa Komisja Porozumiewawcza), later renamed the National Commission (Komisja Krajowa). The Union had a regional structure, comprising 38 regions (region) and two districts (okręg). [16] On December 16, 1980, the Monument to Fallen Shipyard Workers was unveiled in Gdańsk, and on June 28, 1981, another monument was unveiled in Poznań, which commemorated the Poznań 1956 protests. On January 15, 1981, a Solidarity delegation, including Lech Wałęsa, met in Rome with Pope John Paul II. From September 5 to 10, and from September 26 to October 7, Solidarity's first national congress was held, and Lech Wałęsa was elected its president. [18] Last accord of the congress was adoption of republican program "Self-governing Republic". [19]

Meanwhile Solidarity had been transforming itself from a trade union into a social movement [20] or more specifically, a revolutionary movement. [21] Over the 500 days following the Gdańsk Agreement, 9-10 million workers, intellectuals and students joined it or its suborganizations, [1] such as the Independent Student Union (Niezależne Zrzeszenie Studentów, created in September 1980), the Independent Farmers' Trade Union (NSZZ Rolników Indywidualnych "Solidarność" or Rural Solidarity, created in May 1981) and the Independent Craftsmen's Trade Union. [16] It was the only time in recorded history that a quarter of a country's population (some 80% of the total Polish work force) had voluntarily joined a single organization. [1][16] "History has taught us that there is no bread without freedom," the Solidarity program stated a year later. "What we had in mind was not only bread, butter and sausages, but also justice, democracy, truth, legality, human dignity, freedom of convictions, and the repair of the republic." [7] Tygodnik Solidarność, a Solidarity-published newspaper, was started in April 1981.

Using strikes and other protest actions, Solidarity sought to force a change in government policies. In some cases, as in Bielsko-Biała, Solidarity managed to force corrupt officials of the government to lose their jobs. At the same time, it was careful never to use force or violence, so as to avoid giving the government any excuse to bring security forces into play. [22][23] After 27 Bydgoszcz Solidarity members, including Jan Rulewski, were beaten up on March 19, a four-hour warning strike on March 27, involving around twelve million people, paralyzed the country. [1] This was the largest strike in the history of the Eastern bloc, [24] and it forced the government to promise an investigation into the beatings. [1] This concession, and Wałęsa's agreement to defer further strikes, proved a setback to the movement, as the euphoria that had swept Polish society subsided. [1] Nonetheless the Polish communist party - the Polish United Workers' Party (PZPR) - had lost its total control over society. [13]

Yet while Solidarity was ready to take up negotiations with the government, [25] the Polish communists were unsure what to do, as they issued empty declarations and bided their time. [15] Against the background of a deteriorating communist shortage economy and unwillingness to negotiate seriously with Solidarity, it became increasingly clear that the Communist government would eventually have to suppress the Solidarity movement as the only way out of the impasse, or face a truly revolutionary situation. The atmosphere was increasingly tense, with various local chapters conducting a growing number of uncoordinated strikes as well as street protests, such as the Summer 1981 hunger demonstrations in Poland, in response to the worsening economic situation. [1] On December 3, 1981, Solidarity announced that a 24-hour strike would be held if the government were granted additional powers to suppress dissent, and that a general strike would be declared if those powers were used.

[edit] Martial law (1981â ^83)

After the Gdańsk Agreement, the Polish government was under increasing pressure from the Soviet Union to take action and strengthen its position. Stanisław Kania was viewed by Moscow as too independent, and on October 18, 1981, the Party Central Committee put him in the minority. Kania lost his post as First Secretary, and was replaced by Prime Minister (and Minister of Defence) Gen. Wojciech Jaruzelski, who adopted a strong-arm policy.[25]

On December 13, 1981, Jaruzelski began a crack-down on Solidarity, declaring martial law and creating a Military Council of National Salvation (Wojskowa Rada Ocalenia Narodowego, or WRON). Solidarity's leaders, gathered at Gdańsk, were arrested and isolated in facilities guarded by the Security Service (Służba Bezpieczeństwa or SB), and some 5,000 Solidarity supporters were arrested in the middle of the night.[1][16] Censorship was expanded, and military forces appeared on the streets.[25] A couple of hundred strikes and occupations occurred, chiefly at the largest plants and at several Silesian coal mines, but were broken by ZOMO paramilitary riot police. One of the largest demonstrations, on December 16, 1981, took place at the Wujek Coal Mine, where government forces opened fire on demonstrators, killing 9[1] and seriously injuring 22.[18] The next day, during protests at Gdańsk, government forces again fired at demonstrators, killing 1 and injuring 2. By December 28, 1981, strikes had ceased, and Solidarity appeared crippled. The last strike in the 1981 Poland, which ended on December 28, took place in the Piast Coal Mine in the Upper Silesian town of Bieruń. It was the longest underground strike in the history of Poland, lasting 14 days. Some 2000 miners began it on December 14, going 650 meters underground. Out of the initial 2000, half remained until the last day. Starving, they gave up after military authorities promised they would not be prosecuted.[26] On October 8, 1982, Solidarity was banned.[27]

The range of support for the Solidarity was unique: no other movement in the world was supported by Ronald Reagan and Santiago Carrillo, Enrico Berlinguer and the Pope, Margaret Thatcher and Tony Benn, peace campaigners and NATO spokesman, Christians and Western communists, conservatives, liberals and socialists.[28] The international community outside the Iron Curtain condemned Jaruzelski's actions and declared support for Solidarity; dedicated organizations were formed for that purpose (like Polish Solidarity Campaign in Great Britain).[16] US President Ronald Reagan imposed economic sanctions on Poland, which eventually would force the Polish government into liberalizing its policies.[29] Meanwhile the CIA[30] together with the Catholic Church and various Western trade unions such as the AFL-CIO provided funds, equipment and advice to the Solidarity underground.[31] The political alliance of Reagan and the Pope would prove important to the future of Solidarity.[31] The Polish public also supported what was left of Solidarity; a major medium for demonstrating support of Solidarity became masses held by priests such as Jerzy Popiełuszko.[32]

Besides the communist authorities, Solidarity was also opposed by some of the Polish (non-migrant) radical right, believing Solidarity or KOR to be disguised communist groups, dominated by Jewish Trotskyite Zionists.[33]

In July 1983, martial law was formally lifted, though many heightened controls on civil liberties and political life, as well as food rationing, remained in place through the mid-to-late 1980s.[34]

[edit] Underground Solidarity (1982â ^88)

Almost immediately after the legal Solidarity leadership had been arrested, underground structures began to arise.[16] On April 12, 1982, Radio Solidarity began broadcasting.[18] On April 22, Zbigniew Bujak, Bogdan Lis, Władysław Frasyniuk and Władysław Hardek created an Interim Coordinating Commission (Tymczasowa Komisja Koordynacyjna) to serve as an underground leadership for Solidarity.[35] On May 6 another underground Solidarity organization, an NSSZ "S" Regional Coordinating Commission (Regionalna Komisja Koordynacyjna NSZZ "S"), was created by Bogdan Borusewicz, Aleksander Hall, Stanisław Jarosz, Bogdan Lis and Marian A'witek.[18] June 1982 saw the creation of a Fighting Solidarity (Solidarność Walcząca) organization.[35][36]

Throughout the mid-1980s, Solidarity persevered as an exclusively underground organization.[37] Its activists were dogged by the Security Service (SB), but managed to strike back: on May 1, 1982, a series of anti-government protests brought out thousands of participants—several dozen thousand in Kraków, Warsaw and Gdańsk.[18] On May 3 more protests took place, during celebrations of the Constitution of May 3, 1791. On that day, communist secret services killed four demonstrators—three in Warsaw and one in Wrocław. Another wave of demonstrations occurred on August 31, 1982, on the first anniversary of the Gdańsk Agreement (see August 31, 1982 demonstrations in Poland). Altogether, on that day six demonstrators were killed—three in Lubin, one in Kielce, one in Wrocław and one in Gdańsk. Another person was killed on the next day, during a demonstration in Człuchowa. Further strikes occurred at Gdańsk and Nowa Huta between October 11 and 13.[18] In Nowa Huta, a 20-year old student Bogdan Włosik was shot by a secret service officer.

On November 14, 1982, Wałęsa was released.[16] However on December 9 the SB carried out a large anti-Solidarity operation, arresting over 10,000 activists. On December 27 Solidarity's assets were transferred by the authorities to a pro-government trade union, the All-Poland Alliance of Trade Unions (Ogólnopolskie Porozumienie Związków Zawodowych, or OPZZ). Yet Solidarity was far from broken: by early 1983 the underground had over 70,000 members, whose activities included publishing over 500 underground newspapers.[38] In the first half of 1983 street protests were frequent; on May 1, two persons were killed in Kraków and one in Wrocław. Two days later, two additional demonstrators were killed in Warsaw.

On July 22, 1983, martial law was lifted, and amnesty was granted to many imprisoned Solidarity members, who were released.[37] On October 5, Wałęsa was awarded the Nobel Peace Prize.[39] The Polish government, however, refused to issue him a passport to travel to Oslo; Wałęsa's prize was accepted on his behalf by his wife.[40] It later transpired that the SB had prepared bogus documents, accusing Wałęsa of immoral and illegal activities that had been given to the Nobel committee in an attempt to derail his nomination.[41]

On October 19, 1984, three agents of the Ministry of Internal Security murdered a popular pro-Solidarity priest, Jerzy Popiełuszko.[42] As the facts emerged, thousands of people declared their solidarity with the murdered priest by attending his funeral, held on November 3, 1984. The government attempted to smooth over the situation by releasing thousands of political prisoners;[39] a year later, however, there followed a new wave of arrests.[16] Frąsnyńuk, Lis and Adam Michnik, members of the "S" underground, were arrested on February 13, 1985, placed on a show trial, and sentenced to several years' imprisonment.[18][43]

[edit] Second Solidarity (1988–89)

On March 11, 1985, power in the Soviet Union was assumed by Mikhail Gorbachev, a leader who represented a new generation of Soviet party members. The worsening economic situation in the entire Eastern Bloc, including the Soviet Union, together with other factors, forced Gorbachev to carry out a number of reforms, not only in the field of economics (uskoreniye) but in the political and social realms (glasnost and perestroika).[44] Gorbachev's policies soon caused a corresponding shift in the policies of Soviet satellites, including the People's Republic of Poland.[39]

On September 11, 1986, 225 Polish political prisoners were released—the last of those connected with Solidarity, and arrested during the previous years.[39] Following amnesty on September 30, Wałęsa created the first public, legal Solidarity entity since the declaration of martial law—the Temporary Council of NSZZ Solidarność (Tymczasowa Rada NSZZ Solidarność)—with Bogdan Borusewicz, Zbigniew Bujak, Władysław Frąsnyńuk, Tadeusz Janusz Jędynak, Bogdan Lis, Janusz Pańbicki and Józef Pinior. Soon afterwards, the new Council was admitted to the International Confederation of Free Trade Unions.[16] Many local Solidarity chapters now broke their cover throughout Poland, and on October 25, 1987, the National Executive Committee (Solidarity)|National Executive Committee of NSZZ Solidarność (Krajowa Komisja Wykonawcza NSZZ Solidarność) was created.

Nonetheless, Solidarity members and activists continued to be persecuted and discriminated, if less so than during the early 1980s.[18] In the late 1980s, a rift between WaÅ Å sa's faction and a more radical Fighting Solidarity grew as the former wanted to negotiate with the government, while the latter planned for an anti-communist revolution.[35][45][46]

By 1988, Poland's economy was in worse condition than it had been eight years earlier. International sanctions, combined with the government's unwillingness to introduce reforms, intensified the old problems.[29][39] Inefficient government-run planned-economy enterprises wasted labor and resources, producing substandard goods for which there was little demand. Polish exports were low, both because of the sanctions and because the goods were as unattractive abroad as they were at home. Foreign debt and inflation mounted. There were no funds to modernize factories, and the promised "market socialism" materialized as a shortage economy characterized by long queues and empty shelves.[47] Reforms introduced by Jaruzelski and MieczysÅ aw Rakowski came too little and too late, especially as changes in the Soviet Union had bolstered the public's expectation that change must come, and the Soviets ceased their efforts to prop up Poland's failing regime.[39][48]

In February 1988, the government hiked food prices by 40%.[39] On April 21, a new wave of strikes hit the country.[39] On May 2, workers at the GdaÅ sk Shipyard went on strike.[18] That strike was broken by the government between May 5 and May 10, but only temporarily: on August 15, a new strike took place at the "July Manifesto" mine in JastrzÅ bie ZdrÅ j.[18] By August 20 the strike had spread to many other mines, and on August 22 the GdaÅ sk Shipyard joined the strike.[18] Poland's communist government then decided to negotiate.[16][39]

On August 26, CzesÅ aw Kiszczak, the Minister of Internal Affairs, declared on television that the government was willing to negotiate, and five days later he met with WaÅ Å sa. The strikes ended the following day, and on November 30, during a televised debate between WaÅ Å sa and Alfred Miodowicz (leader of the pro-government trade union, the All-Poland Alliance of Trade Unions), WaÅ Å sa scored a public-relations victory.[39][49]

On December 18, a hundred-member Citizens' Committee (Komitet Obywatelski) was formed within Solidarity. It comprised several sections, each responsible for presenting a specific aspect of opposition demands to the government. WaÅ Å sa and the majority of Solidarity leaders supported negotiation, while a minority wanted an anticommunist revolution. Under WaÅ Å sa's leadership, Solidarity decided to pursue a peaceful solution, and the pro-violence faction never attained any substantial power, nor did it take any action.[22][23]

On January 27, 1989, in a meeting between WaÅ Å sa and Kiszczak, a list was drawn up of members of the main negotiating teams. The conference that began on February 6 would be known as the Polish Round Table Talks.[50] The 56 participants included 20 from "S", 6 from OPZZ, 14 from the PZPR, 14 "independent authorities", and two priests. The Polish Round Table Talks took place in Warsaw from February 6 to April 4, 1989. The Communists, led by Gen. Jaruzelski, hoped to co-opt prominent opposition leaders into the ruling group without making major changes in the structure of political power. Solidarity, while hopeful, did not anticipate major changes. In fact, the talks would radically alter the shape of the Polish government and society.[48][50]

On April 17, 1989, Solidarity was legalized, and its membership soon reached 1.5 million.[16][18] The Solidarity Citizens' Committee (Komitet Obywatelski "SolidarnoÅ ") was given permission to field candidates in the upcoming elections. Election law allowed Solidarity to put forward candidates for only 35% of the seats in the Sejm, but there were no restrictions in regard to Senat candidates.[51] Agitation and propaganda continued legally up to election day. Despite its shortage of resources, Solidarity managed to carry on an electoral campaign.[50][51] On May 8, the first issue of a new pro-Solidarity newspaper, Gazeta Wyborcza (The Election Gazette), was published.[52] Posters of WaÅ Å sa supporting various candidates, appeared throughout the country.

Pre-election public-opinion polls had promised victory to the communists.[50] Thus the total defeat of the PZPR and its satellite parties came as a surprise

to all involved: after the first round of elections, it became evident that Solidarity had fared extremely well,[48] capturing 160 of 161 contested Sejm seats, and 92 of 100 Senate seats. After the second round, it had won virtually every seatâ ~all 161 in the Sejm, and 99 in the Senate.[51]

These elections, in which anti-communist candidates won a striking victory, inaugurated a series of peaceful anti-communist revolutions in Central and Eastern Europe[23][53][54] that eventually culminated in the fall of communism.[55][56]

The new Contract Sejm, named for the agreement that had been reached by the communist party and the Solidarity movement during the Polish Round Table Talks, would be dominated by Solidarity. As agreed beforehand, Wojciech Jaruzelski was elected president.[48][51] However, the communist candidate for Prime Minister, Czesław Kiszczak, who replaced Mieczysław Rakowski,[48] failed to gain enough support to form a government.[51][57]

On June 23, a Solidarity Citizens' Parliamentary Club (Obywatelski Klub Parlamentarny "Solidarność") was formed, led by Bronisław Geremek.[48] It formed a coalition with two ex-satellite parties of the PZPR â ~ United People's Party and Democratic Party â ~ which had now chosen to "rebel" against the PZPR, which found itself in the minority.[57] On August 24, the Sejm elected Tadeusz Mazowiecki, a Solidarity representative, to be Prime Minister of Poland.[48][51][57] Not only was he a first non-communist Polish Prime Minister since 1945, he became the first non-Communist prime minister in Eastern Europe for nearly 40 years.[48] In his speech he talked about the "thick line" (Gruba kreska) which would separate his government from the communist past[58] By the end of August 1989, a Solidarity-led coalition government had been formed.

[edit] Party and trade union (1989 to the present)

The fall of the communist regime marked a new chapter in the history of Poland and in the history of Solidarity. Having defeated the communist government, Solidarity found itself in a role it was much less prepared for â ~ that of a political party â ~ and soon began to lose popularity.[16][59] Conflicts among Solidarity factions intensified.[16][60] Wałęsa was elected Solidarity chairman, but support for him could be seen to be crumbling. One of his main opponents, Władysław Frasyniuk, withdrew from elections altogether. In September 1990, Wałęsa declared that Gazeta Wyborcza had no right to use the Solidarity logo.

Later that month, Wałęsa announced his intent to run for president of Poland. In December 1990, he was elected president.[16] He resigned his Solidarity post and became the first president of Poland ever to be elected by popular vote.

Next year, in February 1991, Marian Krzaklewski was elected the leader of Solidarity.[16] President Wałęsa's vision and that of the new Solidarity leadership were diverging. Far from supporting Wałęsa, Solidarity was becoming increasingly critical of the government, and decided to create its own political party for action in the upcoming 1991 parliamentary elections.[61]

The 1991 elections were characterized by a large number of competing parties, many claiming the legacy of anti-communism, and the Solidarity party garnered only 5% of the votes.

On January 13, 1992, Solidarity declared its first strike against the democratically elected government: a one-hour strike against a proposal to raise energy prices. Another, two-hour strike took place on December 14. On May 19, 1993, Solidarity deputies proposed a no-confidence motionâ ~which passedâ ~against the government of Prime Minister Hanna Suchocka.[16] President Wałęsa declined to accept the prime minister's resignation, and dismissed the parliament.

It was in the ensuing 1993 parliamentary elections that it became evident how much Solidarity's support had eroded in the previous three years. Even though some Solidarity deputies sought to assume a more left-wing stance and to distance themselves from the right-wing government, Solidarity remained identified in the public mind with that government. Hence it suffered from the growing disillusionment of the populace, as the transition from a communist to a capitalist system failed to generate instant wealth and raise Poland's living

standards to those in the West, and the government's financial "shock therapy" (the Balcerowicz Plan) generated much opposition.[16][61]

In the elections, Solidarity received only 4.9% of the votes, 0.1% less than the 5% required in order to enter parliament (Solidarity still had 9 senators, 2 fewer than in the previous Senate). The victorious party was the Democratic Left Alliance (Sojusz Lewicy Demokratycznej or SLD), a post-communist left-wing party.[16]

Solidarity now joined forces with its erstwhile enemy, the All-Poland Alliance of Trade Unions (OPZZ), and some protests were organized by both trade unions.[61] The following year, Solidarity organized many strikes over the state of the Polish mining industry. In 1995, a demonstration before the Polish parliament was broken up by the police (now again known as policja) using batons and water guns. Nonetheless, Solidarity decided to support Wałęsa in the 1995 presidential elections.

In a second major defeat for the Polish right wing, the elections were won by an SLD candidate, Aleksander Kwaśniewski, who received 51.72% of votes. A Solidarity call for new elections went unheeded, but the Sejm still managed to pass a resolution condemning the 1981 martial law (despite the SLD voting against). Meanwhile the left-wing OPZZ trade union had acquired 2.5 million members, twice as many as the contemporary Solidarity (with 1.3 million).[61]

In June 1996, Solidarity Electoral Action (Akcja Wyborcza Solidarność) was founded as a coalition of over 30 right-wing parties, uniting liberal, conservative and Christian-democratic forces. As the public became disillusioned with the SLD and its allies, AWS was victorious in the 1997 parliamentary elections.[16] Jerzy Buzek became the new prime minister.

However, controversies over domestic reforms, Poland's 1999 entry into NATO, and the accession process to the European Union, combined with AWS' fights with its political allies (the Freedom Union ~ Unia Wolności) and infighting within AWS itself, as well as corruption, eventually resulted in the loss of much public support.[16] AWS leader Marian Krzaklewski lost the 2000 presidential election, and in the 2001 parliamentary elections AWS failed to elect a single deputy to the parliament.[16] After this debacle, Krzaklewski was replaced by Janusz Źniadek (in 2002) but the union decided to distance itself from politics.[16]

In 2006, Solidarity had some 1.5 million members making it the largest trade union in Poland. Its mission statement declares that Solidarity, "basing its activities on Christian ethics and Catholic social teachings, works to protect workers' interests and to fulfill their material, social and cultural aspirations." [62]

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[edit] External links

Interview with Henry Kissinger on US - Soviet Relations during Solidarity from the [<https://repository.library.georgetown.edu/handle/10822/552494> Dean Peter Krogh Foreign Affairs Digital Archives]

Presentation The Solidarity Phenomenon (PL, EN, DE, FR, ES, RU)

Solidarity official English homepage

Solidarity 25th Anniversary Press Center

International Conference 'From Solidarity to Freedom'

Poland: Solidarity - The Trade Union That Changed The World

Advice for East German propagandists on how to deal with the Solidarity movement

Solidarity, Freedom and Economical Crisis in Poland, 1980-1981

Arch Puddington, How American Unions Helps Solidarity Win

Michael Bernhard, The Polish Opposition and the Technology of Resistance

The Independent Press in Poland, 1976-1990 - this site of the Library of Congress contains a list of Polish abbreviations and their English translations; many of which were used in this article

(Polish) Solidarity Center Foundation - Fundacja Centrum Solidarność

Silver Coin Marks the 30th Anniversary of Poland's Solidarity Movement

[edit] Further reading

Transformers is a 2007 American science fiction action film based on the Transformers toy line. The film, which combines computer animation with live-action, is directed by Michael Bay, with Steven Spielberg serving as executive producer. It stars Shia LaBeouf as Sam Witwicky, a teenager involved in a war between the heroic Autobots and the evil Decepticons, two factions of

alien robots who can disguise themselves by transforming into everyday machinery. The Decepticons desire control of the AllSpark, the object that created their robotic race, with the intention of using it to build an army by giving life to the machines of Earth. Megan Fox, Josh Duhamel, Tyrese Gibson, Jon Voight, Anthony Anderson and John Turturro also star, while voice actors Peter Cullen and Hugo Weaving voice Optimus Prime and Megatron respectively.

Produced by Don Murphy and Tom DeSanto, they developed the project in 2003 and DeSanto wrote a treatment. Steven Spielberg came on board the following year, hiring Roberto Orci and Alex Kurtzman to write the screenplay. The United States Armed Forces and General Motors (GM) loaned vehicles and aircraft during filming, which saved money for the production and added realism to the battle scenes. Hasbro organized an enormous promotional campaign for the film, making deals with hundreds of companies. This advertising blitz included a viral marketing campaign, coordinated releases of prequel comic books, toys and books, as well as product placement deals with GM, Burger King, and eBay.

Despite mixed critical reaction to the radical redesigns of the characters, and reviews criticizing the focus on the humans at the expense of the robots, Transformers was a box office success.[2] It is the forty-fifth most successful film released and the fifth most successful of 2007, grossing approximately US\$709 million worldwide. The film won four awards from the Visual Effects Society and was nominated for three Academy Awards for Best Sound Mixing, Best Visual Effects, and Best Sound Editing. A sequel, Transformers: Revenge of the Fallen, was released on June 24, 2009. Despite extremely negative reviews, it was a commercial success and grossed more than its predecessor. A third film, Transformers: Dark of the Moon, was released on June 29, 2011, in 3-D and went on to gross over \$1 billion, despite mixed to negative reviews. On February 13, 2012, Paramount Pictures announced that a fourth Transformers film will begin production with Bay returning as director. Its scheduled release date is June 2014.[3]

Plot

Optimus Prime, leader of the benevolent Autobots, narrates the collapse of the Transformers' home world, Cybertron. It was destroyed by war between the Autobots and the malevolent Decepticons, lead by Megatron in his quest to get hold of the AllSpark. The Autobots want to find the AllSpark so they can use it to rebuild Cybertron and end the war, while the Decepticons want to use it to defeat the Autobots and take over the universe. Megatron had managed to locate the AllSpark on Earth, but crash-landed in the Arctic Circle and froze in the ice. After stumbling upon his frozen body in 1897, explorer Captain Archibald Witwicky accidentally activated Megatron's navigational system and his eye glasses were imprinted with the coordinates of the AllSpark's location, an incident that left him blind and mentally unstable. Sector 7, a secret government organization created by President Herbert Hoover, discovered the AllSpark in the Colorado River and built the Hoover Dam around it to mask its energy emissions. The still-frozen Megatron was moved into this facility and was used to advance human technology through reverse engineering.

In the present day, the Decepticon known as Blackout arrives in a U.S. military base in Qatar to find the location of Megatron and the AllSpark. He tries to hack into the files of the computer base, but is stopped by Captain William Lennox and his team. Back in the United States, Captain Witwicky's descendant Sam Witwicky buys his first car which turns out to be the Autobot scout Bumblebee, who tries to help him woo his crush Mikaela Banes. Later, Sam catches a glimpse of Bumblebee's true form when he signals the other Autobots.

On Air Force One, another Decepticon named Frenzy infiltrates the plane and tries to hack into the network again, only this time is more successful until he is stopped by the US Security Defense before he can retrieve all of the file information. Frenzy is then picked up by his partner Barricade and they go after Sam after learning he has the glasses needed to find the AllSpark. Sam is rescued by Bumblebee and Mikaela also learns of the Transformers' existence. Bumblebee fights Barricade and manages to subdue him while Sam and Mikaela decapitate Frenzy, but he still survives.

Meanwhile, Scorponok, who was sent by Blackout, goes after Captain Lennox and his team, murdering one of them and injuring another. During the battle, Scorponok is forced to retreat when he gets injured by sabot rounds dropped on him by the Air Force. Sam and Mikaela soon meet Optimus Prime and his other Autobot partners Jazz, Ironhide, and Ratchet. They explain their origins to the two humans and insist on the urgency to get to the Allspark first before the Decepticons, knowing that the Decepticons plan to use it to turn all of Earth's technologies into a new army of Transformers and render humanity extinct. The Autobots bring the two humans back to Sam's house to find the glasses, and they nearly reveal their existence to Sam's parents. However, Sector 7 agent Seymour Simmons and his team find Sam and take his family away to a classified location after learning Sam came into contact with the Autobots. However, Sam and Mikaela are rescued by Optimus and the Autobots, but Bumblebee ends up getting captured. The Autobots get the glasses and use them to find the AllSpark's location so they can destroy it so the Decepticons cannot get to it. Sam and Mikaela along with two hackers named Maggie and Glenn arrive at Hoover Dam, where Maggie and Glenn got arrested by the FBI for trying to decipher the information Frenzy stole.

Frenzy finds the AllSpark and gets his body back, then contacts the other Decepticons, Starscream, Bonecrusher, Brawl, Barricade, and Blackout. Starscream attacks the dam and Frenzy frees Megatron from his frozen prison, where he joins his cohorts into chasing down Sam and the Autobots, where Bumblebee has shrunk the cube to a reasonable size. They then get to Downtown Los Angeles, where a large battle ensues. Working together, the Autobots and human soldiers kill Bonecrusher, Blackout and Brawl. However the war causes Bumblebee to get crippled, and Jazz is killed by Megatron. Optimus urges Sam to put the AllSpark in his chest, which will destroy them both, but Sam instead inserts the cube into Megatron's chest, which kills him and destroys the AllSpark. The dead Transformer bodies are dumped into the Laurentian Abyss in the Atlantic Ocean to be hidden, the government orders the closure of Sector 7, and the Witwicky family are released from custody. Sam and Mikaela soon start a new relationship, and Optimus says that the Autobots' fates have given them a new home, Earth, and sends a message calling out all surviving Autobots to join them. In a mid-credits scene, Starscream escapes into space.

Cast

Live action roles

Shia LaBeouf as Sam Witwicky, a young descendant of an Arctic explorer who stumbled on a big secret which becomes the last hope for Earth.
Megan Fox as Mikaela Banes, a classmate of Sam who assists Sam in his mission by using skills she learned as a juvenile car thief.
Josh Duhamel as William Lennox, the captain of a Special Operations team based at the SOCCENT base in Qatar.
Tyrese Gibson as USAF Combat Controller Technical Sergeant Robert Epps, a member of Captain Lennox's team.
John Turturro as Agent Simmons, a member of Sector 7.
Rachael Taylor as Maggie Madsen, a Pentagon analyst recruited by the Department of Defense.
Anthony Anderson as Glen Whitmann, a hacker friend of Maggie.
Kevin Dunn as Ron Witwicky, Sam's father.
Julie White as Judy Witwicky, Sam's mother.
Jon Voight as John Keller, the United States Secretary of Defense.
Michael O'Neill as Tom Banachek, head of Sector 7 Advanced Research Division.
Amaury Nolasco as ACWO Jorge "Fig" Figueroa, a Special Operations soldier who survives the destruction of the SOCCENT base in Qatar and was also a member of Captain Lennox's team.
Zack Ward as First Sergeant Donnelly, a member of Captain Lennox's team.
Bernie Mac as Bobby Bolivia, a used cars salesman.

Voice roles

Peter Cullen as Optimus Prime the leader of the Autobots. Peter Cullen had previously voiced Optimus Prime in the original 80's cartoon and was chosen to

reprise his role, which was warmly welcomed by audiences.

Mark Ryan as Bumblebee the young scout of the Autobots and best friend of Sam

Darius McCrary as Jazz the second in command to Optimus Prime

Robert Foxworth as Ratchet the Autobots' medic

Jess Harnell as Ironhide the Autobots' weapon's expert/Barricade a Decepticon who transforms into a police car.

Hugo Weaving as Megatron the leader of the Decepticons. Originally Frank Welker (voice of Megatron in the original series) was considered but according to DVD commentary, Director Bay thought his voice didn't fit, so Hugo Weaving was chosen instead.

Jim Wood as Bonecrusher the rampaging mine sweeper of the Decepticons

Reno Wilson as Frenzy a hacker for the Decepticons

Charlie Adler as Starscream Megatron's second in command. Adler had previously voiced several characters in the original series, most noticeably Silverbolt.

Production

Development

"In all the years of movie-making, I don't think the image of a truck transforming into a twenty-foot tall robot has ever been captured on screen. I also want to make a film that's a homage to 1980s movies and gets back to the sense of wonder that Hollywood has lost over the years. It will have those Spielberg-ian moments where you have the push-in on the wide-eyed kid and you feel like you're ten years old even if you're thirty-five."

~ Tom DeSanto on why he produced the film[4]

Don Murphy was planning a G.I. Joe film adaptation, but when the United States launched the invasion of Iraq in March 2003, Hasbro suggested adapting the Transformers franchise instead.[5] Tom DeSanto joined Murphy because he was a fan of the series.[6] They met with comic book writer Simon Furman, and cited the Generation 1 cartoon and comics as their main influence.[5] They made the Creation Matrix their plot device, though Murphy had it renamed because of the film series The Matrix.[7] DeSanto chose to write the treatment from a human point-of-view to engage the audience,[8] while Murphy wanted it to have a realistic tone, reminiscent of a disaster film.[7] The treatment featured the Autobots Optimus Prime, Ironhide, Jazz, Prowl, Arcee, Ratchet, Wheeljack, and Bumblebee, and the Decepticons Megatron, Starscream, Soundwave, Ravage, Laserbeak, Rumble, Skywarp and Shockwave.[9]

Steven Spielberg, a fan of the comics and toys,[6] signed on as executive producer in 2004. John Rogers wrote the first draft, which pitted four Autobots against four Decepticons,[10] and featured the Ark spaceship.[11] Roberto Orci and Alex Kurtzman, fans of the cartoon,[12] were hired to rewrite the script in February 2005.[13] Spielberg suggested that "a boy and his car" should be the focus.[14] This appealed to Orci and Kurtzman because it conveyed themes of adulthood and responsibility, "the things that a car represents in the United States".[15] The characters of Sam and Mikaela were the sole point-of-view given in Orci and Kurtzman's first draft.[16] The Transformers had no dialogue, as the producers feared talking robots would look ridiculous. The writers felt that even if it would look silly, not having the robots speak would betray the fanbase.[12] The first draft also had a battle scene in the Grand Canyon.[17] Spielberg read each of Orci and Kurtzman's drafts and gave notes for improvement.[14] The writers remained involved throughout production, adding additional dialogue for the robots during the sound mixing (although none of this was kept in the final film, which ran fifteen minutes shorter than the initial edit).[18] Furman's The Ultimate Guide, published by Dorling Kindersley, remained as a resource to the writers throughout production.[18] Prime Directive was used as a fake working title. This was also the name of Dreamwave Productions' first Transformers comic book.[19]

Michael Bay was asked to direct by Spielberg on July 30, 2005, but he dismissed the film as a "stupid toy movie".[21] Nonetheless, he wanted to work with Spielberg, and gained a new respect for the concept upon visiting Hasbro. Bay considered the first draft "too kiddie", so he increased the military's role in the story.[22] The writers sought inspiration from G.I. Joe for the

soldier characters, being careful not to mix the brands.[23] Because Orci and Kurtzman were concerned the film could feel like a military recruitment commercial, they chose to make the military believe nations like Iran were behind the Decepticon attack as well as making the Decepticons primarily military vehicles.[citation needed] Bay based Lennox' struggle to get to the Pentagon phoneline while struggling with an unhelpful operator from a real account he was given by a soldier when working on another film.

Orci and Kurtzman experimented with numerous robots from the franchise, ultimately selecting the characters most popular among the filmmakers to form the final cast.[6] Bay acknowledged that most of the Decepticons were selected before their names or roles were developed, as Hasbro had to start designing the toys.[24] Some of their names were changed because Bay was upset that they had been leaked.[25] Optimus, Megatron, Bumblebee and Starscream were the only characters present in each version of the script.[12] Arcee was a female Transformer introduced by Orci and Kurtzman, but she was cut because they found it difficult to explain robotic gender; Bay also disliked her motorcycle form, which he found too small.[23] An early idea to have the Decepticons simultaneously strike multiple places around the world was also dropped.[16]

Design

The filmmakers created the size of each robot with the size of their vehicle mode in mind, supporting the Transformer's rationale for their choice of disguise on Earth.[26] The concept of traveling protoforms was developed by Roberto Orci when he wondered why "aliens who moonlight as vehicles need other vehicles to travel".[27] This reflected a desire to move to a more alien look, away from the "blocky" Generation 1 Transformers.[28] Another major influence in the designs was samurai armor, returning full-circle to the Japanese origins of the toy line.[26] The robots also had to look alien, or else they would have resembled other cinematic robots made in the image of man.[29]

A product placement deal with General Motors supplied alternate forms for most of the Autobots, which saved \$3 million for the production.[30] GM also provided nearly two hundred cars, destined for destruction in the climactic battle scene.[26] The United States Armed Forces provided significant support, enhancing the film's realism: the film features F-22s, F-117s, and V-22 Ospreys, the first time these aircraft were used for a film; soldiers served as extras, and authentic uniforms were provided for the actors. A-10 Thunderbolt IIs and Lockheed AC-130s also appear. Captain Christian Hodge joked that he had to explain to his superiors that the filmmakers wanted to portray most of their aircraft as evil Decepticons: however, he remarked "people love bad guys".[26]

Filming

To save money for the production, director Michael Bay reduced his usual fee by 30 percent. He planned an eighty-three day shooting schedule, maintaining the required pace by doing more camera set-ups per day than usual. Bay chose to shoot the film in the United States instead of Australia or Canada, allowing him to work with a crew he was familiar with, and who understood his work ethic.[22][30] A pre-shoot took place on April 19, 2006, and principal photography began on April 22 at Holloman Air Force Base,[31] which stood in for Qatar. To film the Scorponok sequence at White Sands Missile Range, a sweep was performed to remove unexploded ordnance before building of a village set could begin; ironically, the village would be blown up. The scene was broken down for the pilots flying the AWACS aircraft, who improvised dialogue as if it were an actual battle.[32]

The company also shot at the Hoover Dam and the Pentagon, the first time since the September 11, 2001 attacks that film crews had been allowed at these locations.[31] The external Hoover Dam scenes were shot before tourists arrived daily at 10:00 a.m., with shooting moving inside for the remainder of the day.[32] Production in California was based at Hughes Aircraft at Playa Vista, where the hangar in which Megatron is imprisoned was built.[32] Six weekends were spent in Los Angeles, California shooting the climactic battle, with some elements being shot on the Universal Studios backlot and at Detroit's Michigan Central Station.[31][32] The crew was allowed to shoot at Griffith Observatory,

which was still closed for renovations begun in 2002.[31] Filming wrapped on October 4, 2006.[22]

The film has been found to re-use footage from Bay's previous film Pearl Harbor.[33]

Effects

Spielberg encouraged Bay to restrict computer-generated imagery to the robots and background elements in the action sequences. Stunts such as Bonecrusher smashing through a bus were done practically, while cameras were placed into the midst of car crashes and explosions to make it look more exciting.[32] Work on the animatics began in April 2005.[10] Bay indicated that three quarters of the film's effects were made by Industrial Light & Magic, while Digital Domain made the rest, including the Arctic discovery of Megatron; Frenzy's severed head; a vending machine mutated by the Allspark, and the Autobots' protoforms.[34] Many of the animators were big Transformers fans and were given free rein to experiment: a scene where Jazz attacks Brawl is a reference to a scene in *The Transformers: The Movie* where Kup jumps on Blitzwing.[26]

"I just didn't want to make the boxy characters. It's boring and it would look fake. By adding more doo-dads and stuff on the robots, more car parts, you can just make it more real."

~ Michael Bay on the level of detail he wanted for the robots[35]

ILM created computer-generated transformations during six months in 2005, looking at every inch of the car models.[36] Initially the transformations were made to follow the laws of physics, but it did not look exciting enough and was changed to be more fluid.[37] Bay rejected a liquid metal surface for the characters' faces, instead going for a "Rubik's Cube" style of modeling. He wanted numerous mechanical pieces visible so the robots would look more interesting, realistic, dynamic and quick, rather than like lumbering beasts.[35] One such decision was to have the wheels stay on the ground for as long as possible, allowing the robots to cruise around as they changed.[38] Bay instructed the animators to observe footage of two martial artists and numerous martial arts films to make the fights look graceful.

Due to the intricate designs of the Transformers, even the simplest motion of turning a wrist needs 17 visible parts;[31] each of Ironhide's guns are made of ten thousand parts.[35] Bumblebee uses a piece below his faceplate as an eyebrow, pieces in his cheeks swivel to resemble a smile, and all the characters' eyes are designed to dilate and brighten.[38] According to Bay, "The visual effects were so complex it took a staggering 38 hours for ILM to render just one frame of movement";[31] that meant ILM had to increase their processing facilities.[39] Each rendered piece had to look like real metal, shiny or dull. This was difficult to model because the aged and scarred robots had to transform from clean cars. Close-up shots of the robots were sped up to look "cool", but in wide shots the animation was slowed down to convincingly illustrate a sense of weight. Photographs were taken of each set. These were used as a reference for the lighting environment, which was reproduced within a computer, so the robots would look like they were convincingly moving there. Bay, who has directed numerous car commercials, understood ray tracing was the key to making the robots look real; the CG models would look realistic based on how much of the environment was reflecting on their bodies.[26] Numerous simulations were programmed into the robots, so the animators could focus on animating the particular areas needed for a convincing performance.[39]

Music

Composer Steve Jablonsky, who collaborated with Bay on *The Island*, scored music for the trailers before work began on the film itself. Recording took place in April 2007, at the Sony Scoring Stage in Culver City, California. The score, including the teaser music, uses six major themes across ninety minutes of music.[40] The Autobots have three themes, one named "Optimus" to represent the wisdom and compassion of the Autobot leader, and another played during their arrival on Earth. The Decepticons have a chanted theme which relies on electronics, unlike most of the score. The AllSpark also has its own theme.[41] Hans Zimmer, Jablonsky's mentor, also helped to compose the score.

Marketing

Hasbro's toy line for the film was created over two months in late 2005 and early 2006, in heavy collaboration with the filmmakers.[28] Protoform Optimus Prime and Starscream were released in the United States on May 1, 2007, and the first wave of figures was released on June 2.[28] The line featured characters not in the film, including Arcee.[26] A second wave, titled "AllSpark Power", was set for release late 2007, which consisted of repaints and robotic versions of ordinary vehicles in the film.[42] The toys feature "Automorph Technology", where moving parts of the toy allow other parts to shift automatically.[43] Merchandise for the film earned Hasbro \$480 million in 2007.[44]

Deals were made with 200 companies to promote the film in 70 countries.[45] Michael Bay directed tie-in commercials for General Motors, Panasonic, Burger King and PepsiCo,[46] while props including the Camaro used for Bumblebee and the AllSpark were put up for charity sale on eBay.[47] A viral marketing alternate reality game was employed through the Sector 7 website, which presented the film and all previous Transformers toys and media as part of a cover-up operation called "Hungry Dragon," perpetrated by a "real life" Sector 7 to hide the existence of genuine Transformers. The site featured several videos presenting "evidence" of Transformers on Earth, including a cameo from the original Bumblebee.[48]

Release and reception

Transformers had its worldwide premiere at N Seoul Tower on June 10, 2007.[49][50] The film's June 27 premiere at the Los Angeles Film Festival used a live digital satellite feed to project the film on to a screen.[51] A premiere took place at Rhode Island on June 28, which was a freely available event giving attendees the opportunity to buy tickets for \$75 to benefit four charities: the Rhode Island Community Food Bank, the Autism Project of Rhode Island, Adoption Rhode Island, and Hasbro Children's Hospital.[52] The film was released on IMAX on September 21, 2007,[53] with additional footage that were not included in the general theatrical release.[54]

General

"From the king movie geek Harry Knowles of AintItCool.com to newspaper film critics and regular Joe (and Jane) comments, there is general raving about the mechanical heroes and general grumbling about the excessive screen time given to some of the human characters played by Shia LaBeouf, Anthony Anderson, Tyrese Gibson and Jon Voight. Optimus Prime, the leader of the good-guy Autobots, doesn't appear until midway through the film."
~ USA Today[55]

Transformers fans were initially divided over the film due to the radical redesigns of many characters, although the casting of Peter Cullen was warmly received.[26] Transformers comic book writer Simon Furman and Beast Wars script consultant Benson Yee both warmly received it as spectacular fun, but Furman argued there were too many human storylines.[56] Yee felt that being the first in a series, the film had to establish much of the fictional universe and therefore did not have time to focus on the Decepticons.[57]

The film created a greater awareness of the franchise and drew in many new fans.[58] Transformers' box office success led to the active development of films based on Voltron and Robotech,[59] as well as a Knight Rider remake.[60] When filming the sequel, Bay was told by soldiers the film helped their children understand what their work was like, and that many had christened their Buffalos the vehicle used for Bonecrusher after various Transformer characters.[61]

After the film's 2009 sequel was titled Transformers: Revenge of the Fallen, Roberto Orci was asked if this film would be retitled, just as Star Wars was titled Star Wars Episode IV: A New Hope when re-released. He doubted the possibility, but said if it was retitled, he would call it Transformers: More Than Meets the Eye.[62]

Critical reception

The film received mixed to positive reviews from film critics.[63] At the website Metacritic the film has received a rating average of 61, based on 35

reviews, indicating that it is generally a favorably-reviewed film.[63] Review aggregate website Rotten Tomatoes reported that 57% of critics gave the film positive reviews, based on 220 reviews.[64]IGN's Todd Gilchrist called it Michael Bay's best film, and "one of the few instances where it's OK to enjoy something for being smart and dumb at the same time, mostly because it's undeniably also a whole lot of fun".[65]The Advertiser's Sean Fewster found the visual effects so seamless that "you may come to believe the studio somehow engineered artificial intelligence".[66]The Denver Post's Lisa Kennedy praised the depiction of the robots as having "a believably rendered scale and intimacy",[67] and ABC presenter Margaret Pomeranz was surprised "that a complete newcomer to the Transformers phenomenon like myself became involved in the fate of these mega-machines".[68]Ain't It Cool News's Drew McWeeny felt most of the cast grounded the story, and that "it has a real sense of wonder, one of the things that's missing from so much of the big CGI lightshows released these days".[69] Author Peter David found it ludicrous fun, and said that "[Bay] manages to hold on to his audience's suspension of disbelief long enough for us to segue into some truly spectacular battle scenes".[70]Roger Ebert gave the film a positive review, giving it 3 stars out of four.[71]

Despite the praise for the visual effects, there was division over the human storylines. The Hollywood Reporter's Kirk Honeycutt liked "how a teen plotline gets tied in to the end of the world",[72] while Empire's Ian Nathan praised Shia LaBeouf as "a smart, natural comedian, [who] levels the bluntness of this toy story with an ironic bluster".[73]Ain't It Cool News founder Harry Knowles felt Bay's style conflicted with Spielberg's, arguing the military story only served as a distraction from Sam.[74]James Berardinelli hated the film as he did not connect with the characters in-between the action, which he found tedious.[75]Los Angeles Times' Kenneth Turan found the humans "oddly lifeless, doing little besides marking time until those big toys fill the screen",[76] while ComingSoon.net's Joshua Stames felt the Transformers were "completely believable, right up to the moment they open their mouths to talk, when they revert to bad cartoon characters".[77]Daily Herald's Matt Arado was annoyed that "the Transformers [are] little more than supporting players", and felt the middle act was sluggish.[78]CNN's Tom Charity questioned the idea of a film based on a toy, and felt it would "buzz its youthful demographic [...] but leave the rest of us wondering if Hollywood could possibly aim lower".[79]

Box office

Worldwide, the film was the highest grossing non-sequel movie in 2007. It grossed \$709.7 million, making it Michael Bay's third highest grossing film to date, with only the two sequels surpassing this amount.[2] It was also the fifth highest-grossing film of 2007 worldwide behind Pirates of the Caribbean: At World's End, Harry Potter and the Order of the Phoenix, Spider-Man 3, and Shrek the Third.[80] The film was released in ten international markets on June 28, 2007, including Australia, New Zealand, Singapore and the Philippines. Transformers made \$29.5 million in its first weekend, topping the box office in ten countries.[81] It grossed \$5.2 million in Malaysia, becoming the most successful film in the country's history.[82]Transformers opened in China on July 11, and became the second highest-grossing foreign film in the country (behind Titanic), making \$37.3 million.[83] Its opening there set a record for a foreign language film, making \$3 million.[84] The film was officially released in the United Kingdom on July 27, making £8.7 million, and helped contribute to the biggest attendance record ever for that weekend. It was second at the UK box office, behind The Simpsons Movie.[85] In South Korea, Transformers recorded the largest audience for a foreign film in 2007, and recorded highest foreign revenue of the movie.[86]

In North America, the film had the highest per-screen and per-theater gross in 2007.[87] It was released on July 3, 2007, with 8 p.m. preview screenings on July 2. The U.S. previews earned \$8.8 million,[88] and in its first day of general release it grossed \$27.8 million, a record for Tuesday box-office gross until broken by The Amazing Spider-Man in 2012.[89] It did, however, break Spider-Man 2's record for the biggest July 4 gross, making \$29

million.[90]Transformers opened in over 4,050 theaters in North America,[2] grossed \$70.5 million in its first weekend, amounting to a \$155.4 million opening week, giving it the record for the biggest opening week for a non-sequel.[91] The opening's gross in the United States was 50 percent more than Paramount Pictures expected. One executive attributed it to word of mouth that explained to parents that "it [was] OK to take the kids". A CinemaScore poll indicated the film was most popular with children and parents, including older women, and attracted many African American and Latino viewers.[92]Transformers ended its theatrical run in the United States and Canada with a gross \$319.2 million, making it the third highest-grossing film of 2007 in these regions behind Spider-Man 3 and Shrek the Third.[93]

Accolades

Before its release, Transformers was voted "Best Summer Movie You Haven't Seen Yet" at the 2007 MTV Movie Awards,[94] and at the 2008 MTV Movie Awards, it was voted "best movie". It was nominated for three Academy Awards, in the fields of Achievement in Sound Editing, Achievement in Sound Mixing (Kevin O'Connell, Greg P. Russell and Peter J. Devlin), and Achievement in Visual Effects, but lost to The Bourne Ultimatum and The Golden Compass, respectively.[95] It received a 2008 Kids' Choice Award nomination for Favorite Movie, but lost to Alvin and the Chipmunks.[96] The film received a Jury Merit Award for Best Special Effects in the 2007 Kuala Lumpur International Film Festival.[97] Visual effects supervisor Scott Farrar was honored at the Hollywood Film Festival and Hollywood Awards Gala Ceremony on October 22, 2007 for his work on the film.[98]

In 2008, the Visual Effects Society awarded Transformers four awards: for the best visual effects in an "effects driven" film and the "best single visual effects sequence" (the Optimus-Bonecrusher battle). The film's other two awards were for its miniatures and compositing.[99]Broadcast Music Incorporated awarded composer Steve Jablonsky for his score.[100]Entertainment Weekly named Bumblebee as their fourth favorite computer generated character,[101] while The Times listed Optimus Prime's depiction as the thirtieth best film robot, citing his coolness and dangerousness.[102] On the negative side, Jon Voight was nominated for Worst Supporting Actor (also for Bratz: The Movie, September Dawn and National Treasure: Book of Secrets) at the 28th Golden Raspberry Awards.[103]

Home media

Transformers was released in Region 1 territories on October 16, 2007, on DVD and the now defunct HD DVD format. The Wal-Mart edition of the DVD included a shortened animated version of the prequel comic book, titled Transformers Beginnings and featuring the voices of Mark Ryan, Peter Cullen and Kevin Dunn, as well as Frank Welker as Megatron.[104] The Target copy was packaged with a transforming Optimus Prime DVD case and a prequel comic book about the Decepticons.[104] The DVD sold 8.3 million copies in its first week, making it the fastest-selling DVD of 2007, in North America, and it sold 190,000 copies on HD DVD, which was the biggest debut on the format.[105] The DVDs sold 13.74 million copies, making the film the most popular DVD title of 2007.[106]

It was released on Blu-ray on September 2, 2008.[107] In the first week, the two-disc edition of the Blu-ray was number one in sales compared to other films on the format. The Blu-ray version accounted for two-thirds of the film's DVD sales that first week, selling the third most in overall DVD sales.[108] On June 16, 2009, Paramount included a sticker on all new Transformers DVDs that contained a code to view exclusive content online from the first film and get a sneak peek at Transformers: Revenge of the Fallen. The content includes three exclusive clips from Revenge of the Fallen, behind-the-scenes footage from both films, and never-before-seen deleted scenes from the first film.[109] As of July 2012, in North America, the DVD of the film has sold 16.23 million copies, earning \$292,144,274.[110]

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External links

Concept art

Typhoon Sudal (international designation: 0401, JTWC designation: 03W, PAGASA name: Cosme) was the strongest typhoon to strike the island of Yap in the Federated States of Micronesia (FSM) in about 50 years. Yap is one of the four administrative divisions of the FSM. The entire island, only 17 km (11 mi) in length, experienced typhoon force winds, and 90% of the structures were damaged or destroyed. Damage was most severe in southeastern Yap, where the eyewall struck and winds exceeded 185 km/h (115 mph), but the center of the typhoon passed south of the island.

Typhoon Sudal originally formed on April 2, 2004 out of a persistent area of convection east of the FSM. It moved mostly westward for the first week of its duration, with brief northerly and southwesterly turns. Sudal attained tropical storm status on April 5, and it gradually intensified into a typhoon, which is a tropical cyclone with winds of at least 119 km/h (74 mph) and is the equivalent of a hurricane in the Atlantic Ocean. On April 9, it passed just south of Yap, and shortly thereafter its peak winds were estimated at 240 km/h (150 mph). Later, Sudal moved to the northwest and eventually to the northeast, becoming an extratropical cyclone on April 16 and dissipating two days later.

In addition to the damage on Yap, the typhoon dropped heavy rainfall in Chuuk in the Federated States of Micronesia, where some minor crop damage occurred. Sudal also brushed the United States islands of Guam and Rota with high waves and light rainfall, and later moved very close to the uninhabited Japanese island of Iwo Jima. Overall damage was \$14 million (2004 USD, \$16.1 million 2010 USD), most of which was on Yap, although no fatalities or serious injuries were reported. Due to the heavy damage, the name was retired and replaced with Mirinae. The name "Sudal" was contributed by South Korea for the Pacific tropical cyclone list and is the Korean name for the otter.[1]

[edit] Meteorological history

The origins of Typhoon Sudal were from a persistent area of convection, or thunderstorms, southeast of Pohnpei in the Federated States of Micronesia toward the end of March 2004. Initially, it was in an area of high wind shear,

which is the change in wind direction with height and is unfavorable for tropical cyclogenesis. The unfavorable conditions gradually abated, which allowed convection to increase over a broad, developing circulation center.[1] On April 2, the Japan Meteorological Agency (JMA) classified the system as a weak tropical depression near Chuuk in the FSM. It was later classified with the international designation of 0401, meaning it was the first tropical cyclone of 2004.[2] Slow development continued as the system moved slowly westward, and two days later it was classified as Tropical Depression 03W by the Joint Typhoon Warning Center (JTWC); this was the third tropical cyclone tracked by the agency. Shortly thereafter, the JTWC upgraded the depression to tropical storm status, after convection increased over the circulation.[1]

While steadily intensifying, the system turned toward the north. On April 5, the JMA named the system Sudal, after assessing its maximum sustained winds at 65 km/h (40 mph 10-min sustained).[2] Concurrently, the JTWC estimated winds of 100 km/h (65 km/h 1-min sustained).[1] After crossing over the island of Poluwat,[3] a building ridge to the north caused Sudal to turn west-southwestward. On April 6, an eye feature began forming, and the JTWC upgraded Sudal to typhoon strength about 540 km (340 mi) southeast of Guam, a small island under possession of the United States.[1] The JMA did not follow suit until late the following day,[2] by which time the eye had become more distinct.[1] Around that time, the typhoon turned toward the northwest, and initially it was thought that Sudal would pass safely north of Yap in the FSM.[3] Instead, it turned to the west-southwest toward the island as the ridge intensified. On April 8, the typhoon intensified rapidly; the JTWC reported winds of 215 km/h (135 mph 1-min sustained), or the equivalent of a Category 4 on the Saffir-Simpson Hurricane Scale. Weakening slightly as its forward motion slowed, Typhoon Sudal passed about 45 km (28 mi) south of Yap at 0000 UTC on April 9, which was its closest approach to the island.[1]

Intensification continued throughout the day on April 9, with the appearance of concentric eyewalls on satellite imagery; such a feature is indicative of an intense tropical cyclone. Early on April 10, the JTWC estimated that Sudal attained peak winds of 240 km/h (150 mph 1-min sustained), making the cyclone a super typhoon.[1] At the same time, the JMA estimated peak winds of 165 km/h (105 mph 10-min sustained), as well as a barometric pressure of 940 mbar (27.76 inHg).[2] Also on that day, Sudal entered the area of warning responsibility of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), which provided the name "Cosme" for local advisories. For several days, the typhoon continued to the northwest, fluctuating in intensity but remaining powerful. On April 12, Sudal turned toward the north and northeast through a weakness in the ridge, and its eye increased to a diameter of about 85 km (53 mi). The next day, the typhoon attained a secondary peak intensity of 230 km/h (145 mph 1-min sustained), although it gradually weakened subsequently due to a combination of increasing upper-level wind shear and cooler water temperatures.[1]

Early on April 15, Sudal passed very near the uninhabited Japanese island of Iwo Jima as a rapidly weakening typhoon; at the time, its circulation center was exposed from the deepest convection.[1] Shortly thereafter, both the JTWC and JMA downgraded Sudal to tropical storm status.[1][2] Late on April 15, the JTWC assessed the storm as becoming extratropical, although the JMA maintained advisories until the following day. As an extratropical storm, Sudal continued northeastward until losing its identity early on April 18, well east of Japan and far south of the Aleutian Islands.[1]

[edit] Differences among warning centers

The Japan Meteorological Agency uses 10-minute sustained winds for its tropical cyclone tracking information, while the Joint Typhoon Warning Center uses 1-minute sustained winds.[4][5] The peak 10-minute sustained winds were 165 km/h (105 mph) from JMA and 210 km/h (130 mph) from JTWC. The peak 1-minute sustained winds were 195 km/h (120 mph) from JMA and 240 km/h (150 mph) from JTWC.[1]

Other agencies across the region issued warnings on Typhoon Sudal. The

Philippine Atmospheric, Geophysical and Astronomical Services Administration estimated peak winds of 185 km/h (115 mph).[1] The China Meteorological Administration and the Central Weather Bureau in Taiwan both estimated winds of 165 km/h (105 mph), while the Hong Kong Observatory assessed peak winds of 175 km/h (110 mph).[1][6]

[edit] Impact

Early in its duration as a weak tropical storm, Sudal passed near Chuuk state in the Federated States of Micronesia (FSM). One station reported 17 cm (6.68 inches) of rainfall in a 24 hour period. The passage of the storm left minor roof damage and some crop damage, due to storm surge contaminating groundwater. No deaths or injuries were reported in the state.[3] The storm briefly threatened Guam,[1] and as it passed south of the island, Sudal produced 5.5 m (18 ft) waves and a 0.9 m (3 ft) storm surge. A station at Apra Harbor recorded a 69 km/h (43 mph) wind gust, and light rainfall of around 5 cm (2.0 in) was reported, although no damage was reported on the island. High waves also occurred on Rota in the Northern Marianas Islands.[7] The FSM is an independent nation in Compact of Free Association with the United States, and the latter nation is responsible for aid and protection.[8]

Further west, Typhoon Sudal intensified quickly as it moved through the Caroline Islands and later Yap state. On Ulithi, a wind gust of 132 km/h (82 mph) was reported, and 6.34 inches of rainfall occurred in a 24 hour period. High waves of over 5 m (18 ft) struck the island, causing severe beach erosion and damaging subsistence crops. The winds downed a few trees and wrecked some poorly built homes. On nearby Faraulep and Fais islands, similar meteorological conditions and damages were reported. The small Ngulu Atoll received gale force winds and heavy rainfall, which destroyed half of the island's water storage tanks.[3] Later in its duration, Sudal passed near Iwo Jima, producing wind gusts of 141 km/h (87 mph).[1]

The worst of the damage occurred on the island of Yap. Initially, the typhoon was expected to pass north of the island without affecting it significantly, but instead the island experienced the brunt of the storm.[3] Typhoon Lupit affected the island in the previous year, from which the islanders were still recovering. With the last minute change in direction, government officials rushed to complete preparations on the island. On the day before the typhoon struck, storm shelters were opened in schools and government buildings that could withstand the winds of Sudal. In anticipation of significant damage, Yap officials sent a request to the FSM government for emergency aid to clean up after the storm.[9]

On April 9, the eye of Sudal briefly passed over the southern portion of the island, and winds of 185 km/h (115 mph) struck the island for about four hours.[3] The entire island, only 17 km (11 mi) in length, experienced typhoon force winds.[10] Yap International Airport recorded a peak wind gust of 181 km/h (112 mph); a subsequent survey estimated wind gusts on the island reached 226 km/h (140 mph). Heavy rainfall occurred during Sudal's passage, including 20.0 cm (7.88 inches) in a 48 hour period at the airport. The lowest pressure on the island was 958.5 mbar (28.30 inHg). Along the coast, the typhoon produced waves of 6.7 m (22 ft) in height, along with a 3.7 m (12 ft) storm surge;[3] the combination sunk several ships and heavily damaged the island's coral reefs, the latter which is one of Yap's primary tourism attractions.[3][11]

When Typhoon Sudal struck the island, there were about 8,000 people were living on Yap, with about 1,700 houses. The typhoon destroyed 700 homes, and left another 900 damaged; many of the destroyed homes were wooden. Damage was heaviest in the southeastern portion of the island,[3] including in and around Colonia, the capital city.[12] The strong winds downed trees across the island.[13] Over 90% of the structures on the island were damaged or destroyed, including the hospital, airport, most government facilities, and the water, power and communications systems.[3] One of the five hotels on the island was also destroyed.[14] About 80% of the residents lost power or water after the storm. In the southeastern portion of the island, high waves wrecked most of the coastal homes, and also severely damaged the seawall. The intrusion of salt

water destroyed almost all of the food crops on the island. Following the typhoon's passage, about 1,000 people were left homeless, and another 500 were forced to stay in shelters.[3]

Overall damage from Typhoon Sudal totaled about \$14 million (2004 USD, \$16.1 million 2010 USD), most of which on Yap from property damage. Despite the heavy damage, there were no deaths,[3] although there were initial reports of one fatality.[1] Only 8 people required hospital treatment due to injuries,[14] none of them serious.[1] Typhoon Sudal was the strongest typhoon to strike Yap in about 50 years.[10]

[edit] Aftermath

Following the passage of Sudal, officials in Yap declared a state of emergency,[15] and a day after the typhoon struck, United States President George W. Bush ordered federal disaster aid for the FSM. The latter declaration provided funding for 75% of the debris removal cost and emergency services.[16] Less than a week after the storm, the Pacific Islands Forum provided \$11,500 to Yap for relief efforts.[17] Over the subsequent weeks, the FSM government established a typhoon relief fund of about \$250,000. Additionally, the United States government allocated \$7,443,000 for relief efforts.[14]

Within a few days, the Federal Emergency Management Agency (FEMA) identified primary concerns for the small island, including fixing the water supply, distributing water, clearing roads, and fixing damaged shelters. On the island, the water supply was rapidly diminishing;[15] more than 80% of the islanders were without clean water, and the water from the treatment plant needed to be boiled for extended periods of time.[18] Health issues included dehydration, sickness, and gastrointestinal problems.[15] Without running water, several people bathed in the oil-contaminated harbor where many boats sunk, which caused skin irritations.[11]

Initially, telephone service onto the island was disrupted, and the only method of outside contact was by radio to the University of Guam. The Guam Memorial Hospital dropped a package of medical supplies to Yap, although planes containing aid flying onto the island were disrupted by the damaged runway.[19] About a day after Sudal's passage, the runway was cleared and repaired, which allowed a United States Coast Guard plane to provide relief supplies, including building materials.[12] By April 12, or three days after the typhoon, communication links to the island began to be restored.[13] By four days later, the water treatment plant was repaired. One power station on the island was repaired, but since the strong winds damaged most of the power lines, about 85% of the population remained without electricity. Primary roadways were largely cleared, and all bridges were reopened.[11]

About two weeks after the typhoon's passage, there were still 500 people in 18 shelters in Colonia, the capital city, as well as about 400 people in shelters elsewhere.[20] Many others were either residing with relatives or staying at their damaged properties.[21] The United States Army Corps of Engineers arrived on Yap to coordinate debris removal and installing generators. Officials sent 23 flights of aid to the island, as well as one each to the outlying islands of Ulithi and Fais. About 76,000 litres (20,000 gallons) of water were sent to the island, and five large water tanks were installed. Members of the United States Forest Service arrived to coordinate the receiving and distribution of relief supplies.[20] The Yap hospital was poorly suited to handle the typhoon, due to the lack of medications or emergency medical equipment. About 60 FEMA personnel worked at the hospital, who required additional items, such as their own supply of water and food, to prevent them from acquiring local diseases. During their stay on the island, the group assisted 163 people, mostly for minor issues.[8] Overall, there were about 100 FEMA workers involved on the island, although only 20 stayed there due to lack of hotels and rental cars.[21]

By 26 days after the storm, more than half of the island had power restored, and the cell phone system was fixed.[14] In the weeks and months after the passage of Sudal, water temperatures around Yap decreased from 30 °C (86 °F) to 24 °C (75 °F), due to significant upwelling. The drastic decrease caused unusual amounts of fog over the island, as well as significantly lower

tides.[10] By September 2004, rebuilding was still underway, and half of the schools, which had previously been used as shelters, reopened to students. Power and water lines were completely restored. The hospital remained damaged with a temporary roof, and although private businesses quickly re-opened, government buildings took longer to be rebuilt; this was due to the lengthy process of receiving aid from FEMA.[22] Additionally, officials required a land survey to determine where structures were safe to be rebuilt.[8]

Due to the heavy damage on Yap, the name Sudal was retired during the 38th session of the Economic and Social Commission for Asia and the Pacific and World Meteorological Organization typhoon committee in November 2005; it was replaced with the name Mirinae.[23] Sudal was the seventh Pacific typhoon to be retired.[24][25][26]

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The national flag of Singapore was first adopted in 1959, the year Singapore became self-governing within the British Empire. It was reconfirmed as the

national flag when the Republic gained independence on 9 August 1965. The design is a horizontal bicolour of red above white, overlaid in the canton (upper-left quadrant) by a white crescent moon facing a pentagon of five small white five-pointed stars. The elements of the flag denote a young nation on the ascendant, universal brotherhood and equality, and national ideals.

Vessels at sea do not use the national flag as an ensign. Merchant vessels and pleasure craft fly a civil ensign of red charged in white with a variant of the crescent and stars emblem in the centre. Non-military government vessels such as coast guard ships fly a state ensign of blue with the national flag in the canton, charged with an eight-pointed red and white compass rose in the lower fly. Naval warships fly a naval ensign similar to the state ensign, but in white with a red compass rose emblem.

Rules defined by the Singapore Arms and Flag and National Anthem Act govern the use and display of the national flag. These have been relaxed to allow citizens to fly the flag from vehicles during national holidays and from homes at any time of the year.

[edit] History

Singapore was under British rule in the 19th century, having been amalgamated into the Straits Settlements together with Malacca and Penang. The flag that was used to represent the Settlements was a British Blue Ensign containing three gold crownsâ ~one for each settlementâ ~separated by a red inverted pall, which resembles an inverted Y.[1] The Settlement of Singapore had no separate flag, although the city was granted a coat of arms which featured a lion in 1911. During the occupation of Singapore by the Japanese during the Second World War, the Japanese national flag (also called the NisshÅ ki[2] or the Hinomaru[3]) was used on land by the military and during public events.[4] Soon after the Second World War, Singapore became an independent Crown colony and adopted its own flag. It was modified from the Straits Settlements flag to reduce the number of crowns from three to one.[5][6]

Singapore became self-governing within the British Empire on 3 June 1959.[7] Six months later, upon the installation of the new Yang di-Pertuan Negara (head of state) on 3 December 1959, the national flag was officially adopted, along with the state coat of arms and the national anthem Majulah Singapura ("Onward Singapore").[8] Then-Deputy Prime Minister Toh Chin Chye discussed the creation of the national flag in a 1989 interview:

[A]lthough we were self governing it was necessary right from the beginning that we should rally enough different races together as a Singapore nation... [A]part from the anthem we have to produce the flag and the crest, we insisted that it was a Singapore state flag and should be flown side by side with the Union Jack.[8]

The design of the flag was completed in two months by a committee headed by Toh. He initially wanted the flag's entire background to be red, but the Cabinet decided against this, as red was regarded as a rallying point for communism.[9] Also, Indonesia, Poland and Monaco already had plain red and white flags. According to an account given by Lee Kuan Yew, the Chinese population wanted five stars, which were modeled off the flag of the People's Republic of China and the Muslim population wanted a crescent moon. Both of these symbols were combined to create the national flag of Singapore.[10][11]

On 30 November 1959, the Singapore State Arms and Flag and National Anthem Ordinance 1959 was passed to regulate the use and display of the State Arms and State Flag and the performance of the National Anthem.[12] When presenting the motion to the Legislative Assembly of Singapore on 11 November 1959, Sinnathamby Rajaratnam, the Minister for Culture, stated: "National flags, crest and anthem express symbolically the hopes and ideals of a people... The possession of a national flag and crest is, for a people, symbolic of self-respect." [13] In September 1962, the people of Singapore voted to join the Federation of Malaysia. The process was formally completed on 16 September 1963, when the Malaysian flag was hoisted on Singapore by Prime Minister Lee

Kuan Yew.[14] The Singapore flag was reconfirmed as the national flag when Singapore became fully independent from Malaysia on 9 August 1965.[15]

[edit] Design

The Singapore Arms and Flag and National Anthem Rules define the flag's composition and the symbolism of its elements: red symbolises "universal brotherhood and equality of man", and white, "pervading and everlasting purity and virtue". The waxing crescent moon "represents a young nation on the ascendant". The five stars "stand for the nation's ideals of democracy, peace, progress, justice and equality".[16][17] During the second half of the 20th century, the star and crescent symbol came to be recognized as a symbol of Islamism, and Singapore's flag came to be seen in this context by the nation's Muslim activists.[18]

The ratio of the flag is two units high by three units wide. For the manufacturing of flags, the Government of Singapore stated that the shade of red used on the flag is Pantone 032.[19] According to guidelines published by the Ministry of Information, Communications and the Arts (MICA), the flag may be reproduced in any size and displayed at all times, but it must be in its specified proportions and colours.[20] MICA recommends the sizes 915 by 1,370 mm (approx. 36 by 54 in), 1,220 by 1,830 mm (approx. 48 by 72 in), and 1,830 by 2,740 mm (approx. 72 by 108 in).[21] The material that is recommended for the national flag is bunting wool.[19]

[edit] Regulations and guidelines

Until 2004, the flag was used exclusively on or in front of buildings owned by the government, ministries, statutory boards and educational institutions on a year round basis.[22] The flag could only be flown by individuals and non-governmental organisations during the month of August to mark the country's national day on 9 August.[21] During the National Day celebrations period (1 July ~30 September), rules governing the flying of the national flag outside buildings are relaxed.[23] The flag may be displayed on any vehicle (other than a hearse), vessel or aircraft,[24] and may be incorporated as part of any costume or attire, so long as this is done in a respectful manner.[25]

These restrictions on individuals and non-governmental organisations were relaxed in 2004 to allow the flag to be flown year-round under certain conditions. A statement from the Ministry of Information and the Arts (now MICA, the Ministry of Information, Communications and the Arts) said that "[t]he national flag, national anthem and Singapore lion head... are our most visible symbols of our sovereignty, pride and honour" and urged Singaporeans to use those "rallying" symbols to "identify with the nation".[26] No rationale was provided for the changes, although BBC News correspondents noted that the government had recently been trying to rally patriotic sentiment dampened by economic issues. (In 2003, unemployment in Singapore reached a 17-year-high of 5.9%, and the severe acute respiratory syndrome (SARS) epidemic in East Asia seriously affected the island's tourist trade, causing Singapore Airlines to suffer a financial loss for the first time in its history.)[26]

Following requests by Singaporeans, guidelines for the use of the flag were further broadened in 2006 to give residents a variety of opportunities to express their loyalty to Singapore during National Day celebrations such as the National Day Parade. MICA permitted them to display the flag on vehicles and on themselves or belongings with minimal restrictions, from the middle of July to the end of August for a trial period.[27] The period was extended in 2007 to three months from July to September.[20][28]

Singaporean citizens, government and non-governmental organisations may display or fly the national flag throughout the year to identify themselves with the nation, and especially encouraged to do so during occasions of national celebration or national significance.[20] Non-Singaporean businesses and organisations are also allowed to display the flag throughout the year.[29] The use and display of the flag is governed by Part III of the Singapore Arms and Flag and National Anthem Rules[16] made under the Singapore Arms and Flag and National Anthem Act.[30] It is an offence to knowingly contravene specified provisions of the Singapore Arms and Flag and National Anthem Rules; the

penalty is a fine not exceeding S\$1,000.[31]

The Singaporean government dictates that no person may treat the national flag with disrespect,[32] such as allowing the flag to touch the ground.[33] The flag must not be displayed below any other flag, emblem or object;[34] dipped in salute to any person or thing;[35] or displayed or carried flat or horizontally, but always aloft and free.[36]

Within Singapore, the national flag takes precedence over all other flags, subject to international practice.[37] As such, when it is displayed or flown with other flags, it must be in a position of honour; that is, it should be positioned, where practical, either above all other flags or, if displayed side by side with other flags on the same level, to the left of the other flags (as seen by a person facing the flags).[38] When the flag is raised or carried in a procession with other flags, it must be done so in front of the other flags in a single file, or on the right as seen by the standard bearers if the flags are carried side by side[39] (i.e., on the left as seen by the viewer). The standard bearer must carry the flag high on his or her right shoulder.[40] When the flag is displayed on a platform or stage, it must be above all decorations and be behind and above any person speaking from the platform or stage. If it is displayed from a staff standing on the platform or stage, it must be on the right side of the person speaking from the platform or stage.[41] Finally, when the flag is hung, it must be hung against a vertical wall or other vertical flat surface, with the crescent and stars on the top left position as seen by any spectator facing the flag and the wall or surface.[42]

When the flag is displayed outside a building, it shall be displayed on or in front of the building only from a flagpole.[43] If the flag is flown at night, it should be properly illuminated.[44] The flag must not be displayed on any motor vehicle except on one in which the President of Singapore or any Government minister is travelling on official business.[45] The flag may not be displayed on any private vessel or aircraft.[46] No person may use or apply the flag or any image of it for any commercial purposes or as part of any furnishing, decoration, covering or receptacle,[47] except in such circumstances as may be approved (by MICA) in which there is no disrespect for the flag.[48] Further, it is not permitted to use the flag as part of any trademark,[49] or to produce or display any flag which bears any graphics or word superimposed on the design of the national flag.[50] The flag or any image of it may also not be used or applied as or as part of any costume or attire.[51]

The Government may ask for the flag to be lowered to half-mast in the event of the death of an important person or for national mourning.[52] No person is permitted to use the flag at any private funeral ceremony.[53] However, the national flag can be draped on a coffin during a military or state funeral.[54] No person may display any flag that is damaged or dirty.[55] Any worn out or damaged flag should be packed into a sealed black trash bag before being disposed and not left visible in dustbins.[20]

[edit] Use of the national flag

[edit] During National Day celebrations

Singaporeans are encouraged to display the national flag outside their homes during National Day celebrations, and residents' committees, particularly those of public housing estates, often arrange co-ordinated displays. However, some Singaporeans decline to do so as they associate it with the People's Action Party, the ruling party in Parliament, rather than with the nation.[56]

On National Day in 2007 at the Padang, 8,667 volunteers holding up red and white umbrellas formed the largest-ever representation of Singapore's flag at an event organised by Young NTUC, a youth movement associated with the National Trades Union Congress.[57]

[edit] At other times

Outside the National Day celebrations period, the national flag of Singapore is flown from all buildings housing government and government-related departments, such as armed forces installations, court houses, offices, and educational institutions. A picture of the flag is commonly found in each

classroom, and schools conduct ceremonies at the beginning and the end of the school day at which the national flag is raised and lowered, the national anthem is sung and the national pledge is taken.[58]

The national flag is sometimes flown by Singapore-registered vessels, although this is considered incorrect, as such vessels are required to hoist proper national colours either when entering or leaving port.[59] The ensign is red and charged with a circle enclosing a crescent surmounted by five stars in a circle, all in white.[60] The national flag is not used by coast guard ships and military warships; both classes of ships have their own specific ensigns.

The Singapore Government makes announcements regarding the lowering of the flag to half-mast in the event of a death of an important personage or mourning affecting the nation.[61] The flag has been flown at half-mast during the funerals of former presidents and senior politicians,[62] and on 9 January 2005 as a mark of respect for those who perished in the 2004 Asian Tsunami disaster.[63]

[edit] In culture

Singaporean composer Lim Su Chong composed a song in 1969 entitled Five Stars Arising which took the elements of the national flag as its theme. The lyrics of the song speak of a new moon, five stars and a new flag "arising out of the stormy sea". The moon is "[y]outhful and bright and bearing hope, and tranquil as can be", each of the stars is "a lamp to guide our way; a lamp for all to see" and the flag is "[c]rimson as the blood of all mankind, yet white and pure and free".[64] The song is often sung during National Day celebrations.

In January 2003, Singaporean artist Justin Lee Chee Kong was prevented by the Media Development Authority (MDA) from exhibiting a painting entitled Double Happiness ~ A Fantasy in Red, which consisted of an image of the Singapore flag with various red images of the Chinese characters for double happiness. The move was made on the grounds that "the National Flag is a national symbol and no words or graphics should be superimposed on it". Lee reported that the work was simply a display of one's love for their country and an expression of joy at Singapore's success, and in a press statement, he asked that the piece be "treated as an artistic and complimentary interpretation of a national icon". When interviewed by The New Paper, he said "I know as a citizen that we are not allowed to do it, but this is art and I am an artist." [65] He also complained about double standards as a Chinese artist, Gu Wen Da, had recently exhibited a national flag made of hair at the Esplanade - Theatres on the Bay. Lee felt the use of hair to create the nation's flag meant that the flag was in the wrong colours, and was distasteful.[65] Also in 2003, The Rolling Stones performed in Singapore as part of their 2002/2003 Licks World Tour. At the first performance, there were two inflatable dolls on stage. Both of the dolls had flags placed in their crotch area; one had the Rolling Stones logo and the other had a Singapore flag.[66] Because of the illegal use of the state flag, and for fear of dealing with the government, the dolls and the flags were removed from the second concert by the organizer.[67]

In August 2007, a Singaporean pub, Loof, sent an electronic direct mailer (e-flyer)[68] to at least 1,500 members on its mailing list featuring a close-up shot of the crotch of a female model wearing a red swimsuit or pair of underpants bearing the crescent and five stars of the national flag. This was done as part of the pub's publicity campaign for its National Day events. According to Loof's marketing manager, "[T]he ad was definitely not meant as an insult to the country or anyone. I hope that the ad will be taken in the spirit of humour and fun." A majority of people polled by The New Paper felt the advertisement was disrespectful and in bad taste. MICA said that the advertisement did not breach the law as it only reproduced some components of the flag~it did not, for example, incorporate the flag's red and white background together. However, K.U. Menon, director of MICA's National Resilience Division, said: "MICA does not encourage such ads which treat the national flag with disrespect. [...] Symbols should be treated with some measure of dignity and we hope Loof will withdraw the ad on its own initiative." [69]

In November 2010, during the Asian Games held in China, the Singaporean men's water polo team's swim trunks came under controversy for inappropriately displaying elements of the Singaporean Flag.[70] Critics deemed the garment insulting and an embarrassment to the country, with the crescent moon positioned in the center of the brief, directly over the crotch area. The garment had been designed by the team itself[71] but had not received prior approval from the Ministry of Information, Communications and the Arts. However, even after the controversy came to light, the team was still able to continue wearing it as competition rules did not permit changing a team's uniform midway through the Games. The team was apologetic over the blunder and promised to tweak the design after that competition.

[edit] Other flags of Singapore

In addition to the national flag and ensigns, there are other flags used for official purposes.

Flag

Description

The standard used by the President of Singapore is a modification of the national flag. The crescent and the stars are bigger and centred on a field of red.[72] According to the Istana, the Office of the President of Singapore, the red background and the crescent and stars have the same symbolism as in the national flag. The standard is flown at the Istana from 8:00 am to 6:00 pm, or until the President has left for his private residence.[73]

The Red Ensign of Singapore, which is used for Singapore-registered civilian ships, is a red flag charged with a crescent and five stars, surrounded by a ring. The ratio of the width to the length of the ensign is one to two.

According to the Maritime and Port Authority of Singapore (MPA), this ensign should be used on Singapore ships instead of the national flag. In a 1999 marine circular, the MPA reminded masters, owners and officers of ships that those who do not use the Red Ensign risk being fined under the Merchant Shipping Act (Cap. 179, 1996 Rev. Ed.).[60]

The Singapore Naval Force Ensign was introduced in 1967 by the Ministry of Defence, and is used on all vessels owned by the Republic of Singapore Navy (RSN). According to a construction sheet issued by the Ministry entitled Singapore Naval Force Ensign and numbered Misc. 1 of 1967: "The Singapore Naval Force Ensign shall be a white ensign with the top left hand quarter of red charged with a crescent sided by five stars in a circle all in white and an eight pointed red star with narrow white lines inserted within the star in the lower right hand quarter. The ratio of the width to the length of ensign shall be one by two. The crescent and stars are from the State Flag and the eight pointed star represents the mariner's compass."[74][75][76] This ensign formally replaced the Blue Ensign (now used by non-military government ships)[77] during a ceremony at Telok Ayer Basin.[77]

The State Marine Ensign was created in 1960 and is used on all non-military vessels owned by the government, such as the Coast Guard. According to a construction sheet issued by the Ministry of Defence entitled State Marine Ensign and numbered Misc. 6 of 1960: "The State Marine Ensign shall be a blue ensign with the top left hand quarter of red charged with a crescent sided by five stars in a circle all in white and an eight pointed red and white star in the lower right hand quarter. The ratio of the width to the length of ensign shall be one to two. The colour blue is symbolic of the sea, the crescent and stars are from the State Flag and the eight pointed star represents the mariner's compass."[77][78][79]

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[edit] Other media

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David Alexander Johnston (December 18, 1949 â ^ May 18, 1980) was an American volcanologist with the United States Geological Survey (USGS) who was killed by the 1980 eruption of Mount St. Helens in Washington. One of the principal scientists on the monitoring team, Johnston died while manning an observation post about 6 miles (10 km) from the volcano on the morning of May 18, 1980. He was the first to report the eruption, transmitting the message "Vancouver! Vancouver! This is it!" before being swept away by the lateral blast created by the collapse of the mountain's north flank. Though Johnston's remains have never been found, remnants of his USGS trailer were found by state highway workers in 1993.

Johnston's comprehensive, although truncated, career took him across the United States, where he studied Augustine Volcano in Alaska, the San Juan volcanic field in Colorado, and long-extinct volcanoes in Michigan. Johnston was a meticulous and talented scientist who was known for his analyses of volcanic gases and their relationship to eruptions. This, along with his enthusiasm and positive attitude, made him liked and respected by many of his co-workers. After his death, other scientists lauded his character both verbally and in dedications and letters. Johnston felt that scientists must do what is necessary, including taking risks, to help protect the public from natural disasters. His work and that of his fellow USGS scientists convinced the authorities to close Mount St. Helens to the general public before the 1980 eruption, and to maintain the closure in spite of heavy pressure to re-open the area; their work saved thousands of lives. His story has become part of the popular image of volcanic eruptions and their threat to society, and also part of the history of volcanology. To date, Johnston is one of just two American volcanologists known to have been killed in volcanic eruptions.

Following his death, Johnston was commemorated in several ways, including a memorial fund set up in his name at the University of Washington to fund graduate-level research. Two volcano observatories were established and named after him: one in Vancouver, Washington, and the other on the ridge where he died. Johnston's life and death have been featured in several documentaries, films, docudramas and books about the eruption. Along with other people killed by the volcano, Johnston's name is inscribed on memorials dedicated to their memory.

[edit] Life and career

Johnston was born at the University of Chicago Hospital on December 18, 1949,[1] to Thomas and Alice Johnston.[2] They originally lived in Hometown, Illinois, but moved to Oak Lawn shortly after Johnston's birth.[1] Johnston

grew up with one sister. His father worked as an engineer at a local company and his mother as a newspaper editor. Johnston often took photographs for his mother's newspaper and contributed articles to his school's newspaper. He never married.[1]

After graduating from high school, Johnston attended the University of Illinois at Urbana-Champaign. He planned to study journalism, but became discouraged after a poor grade in a large lecture class. He was intrigued by an introductory geology class, and changed his major.[1] His first geologic project was a study of the Precambrian rock that forms Michigan's Upper Peninsula. There he investigated the remains of an ancient volcano: a suite of metamorphosed basalts, a gabbroic sill, and volcanic roots in the form of a dioritic and gabbroic intrusion. The experience planted the seed of Johnston's passion for volcanoes. After working hard to learn the subject,[1] he graduated with "Highest Honors and Distinction" in 1971.[3][4]

Johnston spent the summer after college in the San Juan volcanic field of Colorado working with volcanologist Pete Lipman in his study of two extinct calderas.[1][3] This work became the inspiration for the first phase of his graduate work at the University of Washington in Seattle, in which he focused on the Oligocene Cimarron andesitic volcanic complex in the western San Juans.[3][5] Johnston's reconstruction of the eruptive history of the extinct volcanoes prepared him to study active volcanoes.[3] Johnston's first experience with active volcanoes was a geophysical survey of Mount Augustine in Alaska in 1975. When Mount Augustine erupted in 1976, Johnston raced back to Alaska, shunting his former work on the Cimarron Volcano into a master's thesis, and making Mount Augustine the focus of his Ph.D. work. He graduated in 1978 with his Ph.D., having shown that (1) the emplacement mechanism of the pyroclastic flows had changed over time, as they became less pumaceous, (2) the magmas contained high quantities of volatile water, chlorine, and sulfur, and (3) underground mixing of the felsic (silicic) magmas with less-viscous mafic (basaltic) magmas could have triggered eruptions. Mount Augustine was also the site of an early near-disaster for Johnston, when he became trapped on the mountain during an eruption after high winds grounded the first two evacuation aircraft.[6]

During the summers of 1978 and 1979, Johnston led studies of the ash-flow sheet emplaced in the 1912 eruption of Mount Katmai in the Valley of Ten Thousand Smokes.[3] The gas phase is extremely important in propelling volcanic eruptions. Because of this, Johnston mastered the many techniques required to analyze glass-vapor inclusions in phenocrysts embedded in lavas, which provide information about gases present during past eruptions. His work at Mount Katmai and other volcanoes in the Valley of Ten Thousand Smokes paved the way for his career, and his "agility, nerve, patience, and determination around the jet-like summit fumaroles in the crater of Mt. Mageik" impressed his colleagues.[3]

Later in 1978, Johnston joined the United States Geological Survey (USGS), where he monitored volcanic emission levels in the Cascades and Aleutian Arc. There he helped to strengthen the theory that eruptions can be predicted, to some degree, by changes in the makeup of volcanic gases.[7] Fellow volcanologist Wes Hildreth said of Johnston, "I think Dave's dearest hope was that systematic monitoring of fumarolic emissions might permit detection of changes characteristically precursory to eruptions" ... Dave wanted to formulate a general model for the behavior of magmatic volatiles prior to explosive outbursts and to develop a corollary rationale for the evaluation of hazards." [3] During this time, Johnston continued to visit Mount Augustine every summer and also assessed the geothermal energy potential of the Azores and Portugal. In the last year of his life, Johnston developed an interest in the health, agricultural, and environmental effects of both volcanic and anthropogenic emissions to the atmosphere.[3]

Johnston was based at the Menlo Park, California, branch of the USGS, but his work on volcanoes took him all over the Pacific Northwest region. When the first earthquakes shook Mount St. Helens on March 16, 1980, Johnston was nearby

at the University of Washington, where he had pursued his doctorate. Intrigued by the possible advent of an eruption, Johnston contacted Stephen Malone, a professor of geology at the university. Malone had been his mentor when Johnston had worked at the San Juan complex in Colorado, and Johnston admired his work.[1] Malone stated that he "put him to work" almost instantly, allowing Johnston to escort interested reporters to a place near the volcano.[8] Johnston was the first geologist on the volcano,[3] and soon became a leader within the USGS team, taking charge of monitoring of volcanic gas emissions.[8]

[edit] Eruption

[edit] Precursor activity

Since its last eruptive activity in the mid-19th century, Mount St. Helens had been largely dormant. Seismographs were not installed until 1972. This period of more than 100 years of inactivity ended in early 1980. On March 15, a cluster of tiny earthquakes rocked the area around the mountain. For six days, more than 100 earthquakes clustered around Mount St. Helens, an indication that magma was moving. There was initially some doubt as to whether the earthquakes were precursors to an eruption.[9] By March 20, a magnitude 4.2 earthquake shook the wilderness around the volcano. The next day, seismologists installed three seismic recorder stations.[10] By March 24, volcanologists at the USGSâ ~including Johnstonâ ~became more confident that the seismic activity was a sign of an impending eruption. After March 25, seismic activity drastically increased. By March 26, more than seven earthquakes over magnitude 4.0 had been recorded, and the next day, hazard warnings were publicly issued.[9] On March 27, a phreatic eruption took place, ejecting a plume of ash nearly 7,000 feet (2,134Â m) into the air.[9]

Similar activity continued at the volcano over the following weeks, excavating the crater, forming an adjacent caldera, and erupting small amounts of steam, ash, and tephra. With each new eruption, the plumes of steam and ash from the volcano rose, eventually climbing to 20,000 feet (6,000Â m). By late March, the volcano was erupting up to 100 times per day.[11] Spectators congregated in the vicinity of the mountain, hoping for a chance to see its eruptions. They were joined by reporters on helicopters, as well as mountain climbers.[11]

On April 17, a bulge was discovered on the mountain's north flank, suggesting that Mount St. Helens could produce a lateral blast.[12] Johnston was one of few people who believed this, along with a professor of geology at a Tacoma community college, Jack Hyde. Observing that Mount St. Helens did not possess visible vents, Hyde suggested that pressure would increase until the mountain exploded. Because Hyde was not a part of the USGS or in a position of responsibility, his opinion was generally dismissed.[13] However, both were to be proven correct. Rising magma under Mount St. Helens had veered off to the north flank, creating a growing bulge on the surface.[12]

[edit] Final signs and primary blast

Given the increasing seismic and volcanic activity, Johnston and the other volcanologists working for the USGS in its Vancouver branch prepared to observe any impending eruption. Geologist Don Swanson and others placed reflectors on and around the growing domes,[14] and established the ColdwaterÂ I and II observation posts to use laser ranging to measure how the distances to these reflectors changed over time as the domes deformed. ColdwaterÂ II, where Johnston died, was located just 6 miles (10Â km) north of the mountain. To the astonishment of the USGS geologists, the bulge was growing at a rate of 5 to 8 feet (1.5 to 2.4 meters) per day.[15]

Tiltmeters installed on the volcano's north side displayed a northwest trending tilt for that side of the mountain, and a southwest trending tilt was observed on the south side. Worried that the amount of pressure on the magma underground was increasing, scientists analyzed gases by the crater, and found high traces of sulfur dioxide. After this discovery, they began to regularly check the fumarolic activity and monitor the volcano for dramatic changes, but none were observed. Disheartened, they instead opted to study the growing bulge and the threat an avalanche could have for humans relatively near the volcano.[16] An evaluation of the threat was carried out, concluding that a

landslide or avalanche in the Toutle River could spawn lahars, or mudflows, downstream.[12]

At that point, the previously consistent phreatic activity had become intermittent. Between May 10 and May 17, the only change occurred on the volcano's north flank, as the bulge increased in size. On May 16 and 17, the mountain stopped its phreatic eruptions completely.[16]

The active Mount St. Helens was extremely different from its dormant form, now featuring an enormous bulge and several craters. In the week preceding the eruption, cracks formed in the north sector of the volcano's summit, indicating a movement of magma from the bulge and towards the caldera.[16]

At 8:32 a.m. local time the next day (18 May), an earthquake measuring magnitude 5.1 on the Richter scale rocked the area, triggering the landslide that started the main eruption. In a matter of seconds, vibrations from the earthquake loosened 2.7 cubic kilometers (0.66 cu mi) of rock on the mountain's north face and summit, creating a massive landslide. With the loss of the confining pressure of the overlying rock, the caldera of Mount St. Helens began to rapidly emit steam and other volcanic gases. A few seconds later, it erupted laterally, sending swift pyroclastic flows down its flanks at near supersonic speeds. These flows were later joined by lahars.[17] Before being struck by a series of flows that, at their fastest, would have taken less than a minute to reach his position, Johnston managed to radio "Vancouver! Vancouver! This is it!" to his USGS co-workers. Seconds later, the signal from the radio went silent.[18] Initially, there was some debate as to whether Johnston had survived; records soon showed a radio message from fellow eruption victim and amateur radio operator Gerry Martin, located near the Coldwater peak and further north of Johnston's position, reporting his sighting of the eruption enveloping the Coldwater II observation post. As the blast overwhelmed Johnston's post, Martin declared solemnly, "Gentlemen, the uh, camper and the car sitting over to the south of me is covered. It's gonna get me, too. I can't get out of here..." before his radio, too, went silent.[19]

The extent, speed and direction of the avalanche and pyroclastic flows that overwhelmed Johnston, Martin, and others were later described in detail in a paper titled 'Chronology and Character of the 18 May 1980 Explosive Eruptions of Mount St. Helens', published in 1984 in a collection published by the National Research Council's Geophysics Study Committee.[20] In this paper, the authors examined photographs and satellite images of the eruption to construct a chronology and description of the first few minutes. Included in the paper is figure 10.3, a series of timed photographs taken from Mount Adams, 33 miles (53 km) east of Mount St. Helens. These six photographs, taken sideways on to the lateral blast, vividly show the extent and size of the avalanche and flows as they reached northwards over and beyond Johnston's position. Figure 10.7 from the same paper is an overhead diagram showing the position of the pyroclastic surge front at half-minute intervals, with the positions of Johnston (Coldwater II) and Martin included.[20]

The eruption was heard hundreds of miles away,[21] but some of those who survived the eruption declared that the landslide and pyroclastic flows were silent as they raced down the mountain. Krau Kilpatrick, an employee of the United States Forest Service, recalled, "There was no sound to it, not a sound. It was like a silent movie and we were all in it." [22] The reason for this discrepancy is a "quiet zone", created as a result of the motion and temperature of air and, to a lesser extent, upon local topography.[21]

Famous for telling reporters that being on the mountain was like "standing next to a dynamite keg and the fuse is lit", [23] Johnston had been among the first volcanologists at the volcano when eruptive signs appeared, and shortly after was named the head of volcanic gas monitoring. Though a careful analyst, Johnston strongly believed that scientists needed to take this risk for themselves in order to prevent civilian deaths, and therefore chose to partake in dangerous on-site monitoring. He and several other volcanologists prevented people from being near the volcano during the few months of pre-eruptive activity, and successfully fought pressure to re-open the area.[7] Their work

kept the death toll at a few tens of individuals, instead of the thousands who possibly could have died had the region not been closed off. Johnston supported the lateral blast theory: he believed the explosive eruption would be ejected sideways out of the volcano, not upward. He also believed that the eruption would originate from the bulge. Because of this, he was more aware than most of the threat of a north-directed eruption.[7]

[edit] USGS team and rescue efforts

Many USGS scientists worked on the team monitoring the volcano, but it was graduate student Harry Glicken who had been manning the ColdwaterÂ II observation post for the two and a half weeks immediately preceding the eruption.[24] The evening before the eruption he was scheduled to be relieved by USGS geologist Don Swanson in order to visit the graduate school at the University of California. Swanson, however, wanted to meet with a German graduate student who was returning to Germany on May 18. Two days before the eruption, Swanson ran into Johnston in the hallway and asked him to take his place. Johnston hesitantly agreed to man the base for one day.[25] That Saturday, the day before the eruption took place, Johnston ascended the mountain and went on a patrol of the volcano with geologist Carolyn Driedger. Tremors shook the mountain. Driedger was supposed to camp on one of the ridges overlooking the volcano that night, but Johnston told her to head home and said that he would stay on the volcano alone.[26] While at ColdwaterÂ II, Johnston was to observe the volcano for any further signs of an eruption.[27] Just prior to his departure, at 7Â p.m. on the evening of May 17, 13Â½ hours before the eruption, Glicken took a photograph of Johnston sitting by the observation post trailer with a notebook on his lap, smiling.[16]

The following morning, May 18, at 8:32 a.m.,[28] the volcano erupted. Immediately, rescue workers were dispatched to the area. The official USGS pilot, Lon Stickney, who had been flying the scientists to the mountain, conducted the first rescue attempt. He flew his helicopter over the scarred remains of trees, valleys, and the ColdwaterÂ II observation post ridge, where he saw bare rock and uprooted trees. Because he saw no sign of Johnston's trailer, Stickney began to panic, becoming "emotionally distraught".[29]

Frantic and guilt-stricken, Harry Glicken convinced three separate helicopter pilots to take him up on flights over the devastated area in a rescue attempt, but the eruption had so changed the landscape that they were unable to locate any sign of the ColdwaterÂ II observation post, which had been swept away and buried in the blast. He and the helicopter crew did manage to find a car with people in it at a logging camp, but when they landed to attempt an evacuation, skin fell off the dead victims' hands.[24] Shortly after the eruption, Don Swanson found Johnston's backpack and parka buried in the rubble, but he hid the discovery from all but a few people for fear that scavengers (who were already removing and selling souvenirs of victims of the volcano) would find and remove his friend's body or belongings.[30] In 1993, while building a 9-mile (14Â km) extension of Washington State Route 504 (also called "Spirit Lake Memorial Highway") to lead to the Johnston Ridge Observatory, construction workers discovered pieces of Johnston's trailer.[31] His body, however, has never been recovered.[32]

[edit] Consequences and response

The public was shocked by the extent of the eruption, which had lowered the elevation of the summit by 1,313 feet (400Â m), destroyed 230 square miles (596Â km²) of woodland, and spread ash into other states.[33] The lateral blast that killed Johnston started at 220 miles per hour (354Â km/h) and accelerated to 670 miles per hour (1,078Â km/h).[21] Even USGS scientists were awed. With a Volcanic Explosivity Index value of 5, the eruption was catastrophic. More than 50 people were killed or missing, including Johnston, mountain resident Harry Randall Truman, and National Geographic photographer Reid Blackburn.[33]

The disaster was the deadliest and most destructive volcanic eruption in the history of the United States of America. A total of 57 people are known to have died, and more were left homeless when the ash falls and pyroclastic flows destroyed or buried 200 houses. In addition to the human fatalities, thousands

of animals perished. The official estimate from the USGS was 7,000 game animals, 12 million salmon fingerlings, and 40,000 salmon.[33]

Two years after the eruption, the United States government set aside 110,000 acres (450Â km²) of land for the Mount St. Helens National Volcanic Monument. This protected area, which includes the Johnston Ridge Observatory and several other research and visitor centers, serves as an area for scientific research, tourism, and education.[34]

[edit] Legacy

[edit] Scientific

Johnston, known to his friends as Dave, was commemorated by both his fellow scientists and by the government. Known for his diligent and particular nature, he was called "an exemplary scientist" by a USGS dedication paper, which also described him as "unaffectedly genuine, with an infectious curiosity and enthusiasm".[7] He was quick to "dissipate cynicism" and believed that "careful evaluation and interpretation" was the best approach to his work.[7] An obituary notice for Johnston stated that at the time of his death he had been "among the leading young volcanologists in the world" and that his "enthusiasm and warmth" would be "missed at least as much as his scientific strength".[35] Co-worker Andrew Alden states that Johnston had great potential, declaring that he "had many friends and a bright future".[36] Following the eruption, Harry Glicken and other geologists at the USGS dedicated their work to Johnston.[30]

Because Johnston was believed to be safe at the ColdwaterÂ II observation post, the fact that he died shocked his friends and co-workers alike. However, most of his colleagues and family asserted that Johnston died "doing what he wanted to do." [2] His mother stated in an interview shortly after the eruption, "Not many people get to do what they really want to do in this world, but our son did.Â ... He would tell us he may never get rich but he was doing what he wanted. He wanted to be near if the eruption came. In a phone call on Mother's Day, he told us it's a sight very few geologists get to see." [2] Dr. Stephen Malone agreed that Johnston died doing what he loved, and stated that he "was very good at his work".[8]

Johnston's role in the study of the volcano in the weeks leading up to the eruption was acknowledged in 1981 in a chronology of the eruption, published as part of the USGS report titled 'The 1980 Eruptions of Mount St. Helens, Washington':

Among the many contributors of data, none was more essential to the systematic reconstruction of the events of 1980 at Mount St. Helens than David Johnston, to whose memory this report is dedicated. Dave, who was present through all of the activity up to the climactic eruption and who lost his life in that eruption, provided far more than data. His insights and his thoroughly scientific attitude were crucial to the entire effort; they still serve as a model for us all.

â ~ R. L. Christiansen and D. W. Peterson, Chronology of the 1980 Eruptive Activity[37]

Since Johnston's death, his field of volcanic eruption prediction has advanced significantly, and volcanologists are now able to predict eruptions based on a number of precursors that become apparent between days and months in advance.[38] Geologists can now identify characteristic patterns in seismic waves that indicate particular magmatic activity.[39] In particular, volcanologists have used deep, long-period earthquakes that indicate that magma is rising through the crust. They can also use carbon dioxide emission as a proxy for magma supply rate. Measurements of surface deformation due to magmatic intrusions, like those that were conducted by Johnston and the other USGS scientists at the ColdwaterÂ I and II outposts, have advanced in scale and precision. Ground deformation monitoring networks around volcanoes now consist of InSAR (interferometry), surveys of networks of GPS monuments, microgravity surveys in which scientists measure the change in gravitational potential or acceleration because of the intruding magma and resulting deformation, strain

meters, and tiltmeters. Though there is still work to be done, this combination of approaches has greatly improved scientists' abilities to forecast volcanic eruptions.[38]

Despite the deaths of other volcanologists in later eruptions at Mount Unzen and Galeras, prediction methods similar to Johnston's allowed scientists to convince residents of settlements near the Mount Pinatubo volcano to evacuate, preventing thousands of deaths.[36] In addition to his work, Johnston himself has become part of the history of volcanic eruptions. With Harry Glicken, he is one of two volcanologists from the United States to die in a volcanic eruption.[40] Glicken was being mentored by Johnston, who relieved Glicken of his watch at the ColdwaterÂ II observation post 13 hours before Mount St. Helens erupted.[24] Glicken died in 1991, eleven years later, when a pyroclastic flow overran him and several others at Mount Unzen in Japan.[40][41]

[edit] Commemoration

Early acts of commemoration included two trees that were planted in Tel Aviv, Israel,[6] and the renaming of a community center in Johnston's hometown as the "Johnston Center". These actions were reported in newspapers during the first anniversary of the eruption in May 1981.[6][42]

On the second anniversary of the eruption, the USGS office in Vancouver (which had been permanently established following the 1980 eruption) was renamed the David A. Johnston Cascades Volcano Observatory (CVO) in his memory.[43] This volcano observatory is the one most responsible for monitoring Mount St. Helens, and helped to predict all of the volcano's eruptions between 1980 and 1985.[44] In a 2005 open day, the lobby area of the CVO included a display and painting commemorating Johnston.[45]

Johnston's connections with the University of Washington (where he had carried out his masters and doctoral research) are remembered by a memorial fund that established an endowed graduate-level fellowship within what is now the department of Earth and Space Sciences. By the time of the first anniversary of his death, the fund had exceeded \$30,000. Known as the 'David A. Johnston Memorial Fellowship for Research Excellence', a number of awards of this fellowship have been made over the years since it was launched.[6][46]

Following the eruption, the area where the ColdwaterÂ II observation post had been was sectioned off. Eventually, an observatory was built in the area in Johnston's name, and opened in 1997.[47] Located just over 5 miles (8Â km) from the north flank of Mount St. Helens, the Johnston Ridge Observatory (JRO) allows the public to admire the open crater, new activity, and the creations of the 1980 eruption, including an extensive basalt field. Part of the Mount St. Helens National Volcanic Monument, the JRO was constructed for \$10.5 million, equipped with monitoring equipment. Visited by thousands of tourists annually, it also includes tours, a theater, and an exhibit hall.[48]

There are several public memorials where Johnston's name is inscribed in a list of those known to have died in the eruption. These memorials include a large curved granite monument at an outside viewing area at the Johnston Ridge Observatory, which opened in 1997, and a plaque at the Hoffstadt Bluffs Visitor Center, which was unveiled in a memorial grove in May 2000.[49]

[edit] Depictions

There have been several tellings of Johnston's story in documentaries, films and docudramas about the eruption. Documentaries such as *The Eruption of Mount St. Helens!* (1980) appeared the same year, while a movie was filmed in the year following the eruption and released to coincide with the first anniversary. The story of Mount St. Helens and Johnston continues to be told in documentaries and reconstructions several decades after the eruption took place.

In the 1981 film *St. Helens*, actor David Huffman starred as a renamed Johnston (David Jackson). Controversially, Huffman's character became involved in a love affair and was killed by the blast while on top of the mountain. Johnston's parents criticized the production of the film, arguing that it possessed not "an ounce of David in it" and portrayed "him as a daredevil rather than a careful scientist".[18] They threatened to sue over the fact that they felt their son's memory had been contaminated. Johnston's mother stated that the

film had changed many true aspects of the eruption, and depicted her son as "a rebel" with "a history of disciplinary trouble".[18]

Prior to the film's release during the one-year anniversary of the eruption, 36 scientists who knew Johnston signed a letter of protest. They wrote that, "Dave's life was too meritorious to require fictional embellishments," and that, "Dave was a superbly conscientious and creative scientist." [50] Don Swanson, a USGS geologist who was Johnston's friend and who, due to other commitments, had convinced Johnston to take his place at the Coldwater II observation post on the day of the eruption, [25] believed that a movie based on Johnston's true life and exploits would have been a hit because of his friend's character. [50]

Several documentaries and docudramas have covered the history of the eruption, including archive footage and dramatisations of Johnston's story. These include Up From the Ashes (1990) by KOMO-TV, an episode of the 2005 second series of Seconds From Disaster broadcast by the National Geographic Channel, [51] and an episode of the 2006 series Surviving Disaster, broadcast on the BBC and Discovery Channel. [52]

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[edit] External links

David A. Johnston (United States Geological Survey obituary, hosted by the Cascades Volcano Observatory)

David Alexander Johnston's memoriam article by Wes Hildreth includes 1978 photograph of Johnston (USGS Geological Survey Circular 838, hosted by the US National Park Service)

David Johnston's memorial page that includes photographs of Johnston following his arrival at the volcano (St. Helens Hero website)

This is it's 1995 local newspaper retrospective on Johnston (St. Helens Hero website)

The Victims of the Eruption's memorial page that includes a photograph of the Hoffstadt Bluffs memorial plaque (The many faces of Mount St. Helens website)

Mount St. Helens - Victims' map that shows the position of Johnston and the others killed by the eruption (The Daily News, TDN.com)

A photon is an elementary particle, the quantum of light and all other forms of electromagnetic radiation, and the force carrier for the electromagnetic force, even when static via virtual photons. The effects of this force are easily observable at both the microscopic and macroscopic level, because the photon has no rest mass; this allows for interactions at long distances. Like all elementary particles, photons are currently best explained by quantum mechanics and exhibit wave-particle duality, exhibiting properties of both waves and particles. For example, a single photon may be refracted by a lens or exhibit wave interference with itself, but also act as a particle giving a definite result when its position is measured.

The modern photon concept was developed gradually by Albert Einstein to explain experimental observations that did not fit the classical wave model of light. In particular, the photon model accounted for the frequency dependence of light's energy, and explained the ability of matter and radiation to be in thermal equilibrium. It also accounted for anomalous observations, including the properties of black body radiation, that other physicists, most notably Max Planck, had sought to explain using semiclassical models, in which light is still described by Maxwell's equations, but the material objects that emit and

absorb light, do so in amounts of energy that are quantized (i.e., they change energy only by certain particular discrete amounts and cannot change energy in any arbitrary way). Although these semiclassical models contributed to the development of quantum mechanics, many further experiments[2][3] starting with Compton scattering of single photons by electrons, first observed in 1923, validated Einstein's hypothesis that light itself is quantized. In 1926 the chemist Gilbert N. Lewis coined the name photon for these particles, and after 1927, when Arthur H. Compton won the Nobel Prize for his scattering studies, most scientists accepted the validity that quanta of light have an independent existence, and Lewis' term photon for light quanta was accepted.

In the Standard Model of particle physics, photons are described as a necessary consequence of physical laws having a certain symmetry at every point in spacetime. The intrinsic properties of photons, such as charge, mass and spin, are determined by the properties of this gauge symmetry. The photon concept has led to momentous advances in experimental and theoretical physics, such as lasers, Bose-Einstein condensation, quantum field theory, and the probabilistic interpretation of quantum mechanics. It has been applied to photochemistry, high-resolution microscopy, and measurements of molecular distances. Recently, photons have been studied as elements of quantum computers and for sophisticated applications in optical communication such as quantum cryptography.

[edit] Nomenclature

In 1900, Max Planck was working on black-body radiation and suggested that the energy in electromagnetic waves could only be released in "packets" of energy. In his 1901 article [4] in *Annalen der Physik* he called these packets "energy elements". The word quanta (singular quantum) was used even before 1900 to mean particles or amounts of different quantities, including electricity. Later, in 1905 Albert Einstein went further by suggesting that electromagnetic waves could only exist in these discrete wave-packets.[5] He called such a wave-packet the light quantum (German: *das Lichtquant*). The name photon derives from the Greek word for light, *phōs* (transliterated *phōs*), and was coined[Note 1] in 1926 by the physical chemist Gilbert Lewis, who published a speculative theory in which photons were "uncreatable and indestructible".[6] Although Lewis' theory was never accepted as it was contradicted by many experiments, his new name, photon, was adopted immediately by most physicists. Isaac Asimov credits Arthur Compton with defining quanta of energy as photons in 1923.[7][8]

In physics, a photon is usually denoted by the symbol γ (the Greek letter gamma). This symbol for the photon probably derives from gamma rays, which were discovered in 1900 by Paul Villard,[9][10] named by Ernest Rutherford in 1903, and shown to be a form of electromagnetic radiation in 1914 by Rutherford and Edward Andrade.[11] In chemistry and optical engineering, photons are usually symbolized by $h\nu$, the energy of a photon, where h is Planck's constant and the Greek letter ν (nu) is the photon's frequency. Much less commonly, the photon can be symbolized by hf , where its frequency is denoted by f .

[edit] Physical properties

The photon is massless,[Note 2] has no electric charge,[12] and is stable. A photon has two possible polarization states and is described by exactly three continuous parameters: the components of its wave vector, which determine its wavelength λ and its direction of propagation. The photon is the gauge boson for electromagnetism,[13] and therefore all other quantum numbers of the photon (such as lepton number, baryon number, and flavour quantum numbers) are zero.[14]

Photons are emitted in many natural processes. For example, when a charge is accelerated it emits synchrotron radiation. During a molecular, atomic or nuclear transition to a lower energy level, photons of various energy will be emitted, from infrared light to gamma rays. A photon can also be emitted when a particle and its corresponding antiparticle are annihilated (for example, electron-positron annihilation).

In empty space, the photon moves at c (the speed of light) and its energy and momentum are related by $E = pc$, where p is the magnitude of the momentum vector

p. This derives from the following relativistic relation, with $m = 0$: [15]

The energy and momentum of a photon depend only on its frequency ($\hat{\omega}$) or inversely, its wavelength ($\hat{\lambda}$):

where k is the wave vector (where the wave number $k = |k| = 2\pi / \hat{\lambda}$), $\hat{\omega} = 2\pi \hat{\nu}$ is the angular frequency, and $\hbar = h/2\pi$ is the reduced Planck constant. [16]

Since p points in the direction of the photon's propagation, the magnitude of the momentum is

The photon also carries spin angular momentum that does not depend on its frequency. [17] The magnitude of its spin is and the component measured along its direction of motion, its helicity, must be $\pm\hbar$. These two possible helicities, called right-handed and left-handed, correspond to the two possible circular polarization states of the photon. [18]

To illustrate the significance of these formulae, the annihilation of a particle with its antiparticle in free space must result in the creation of at least two photons for the following reason. In the center of mass frame, the colliding antiparticles have no net momentum, whereas a single photon always has momentum (since it is determined, as we have seen, only by the photon's frequency or wavelength which cannot be zero). Hence, conservation of momentum (or equivalently, translational invariance) requires that at least two photons are created, with zero net momentum. (However, it is possible if the system interacts with another particle or field for annihilation to produce one photon, as when a positron annihilates with a bound atomic electron, it is possible for only one photon to be emitted, as the nuclear Coulomb field breaks translational symmetry.) The energy of the two photons, or, equivalently, their frequency, may be determined from conservation of four-momentum. Seen another way, the photon can be considered as its own antiparticle. The reverse process, pair production, is the dominant mechanism by which high-energy photons such as gamma rays lose energy while passing through matter. [19] That process is the reverse of "annihilation to one photon" allowed in the electric field of an atomic nucleus.

The classical formulae for the energy and momentum of electromagnetic radiation can be re-expressed in terms of photon events. For example, the pressure of electromagnetic radiation on an object derives from the transfer of photon momentum per unit time and unit area to that object, since pressure is force per unit area and force is the change in momentum per unit time. [20]

[edit] Experimental checks on photon mass

The photon is currently understood to be strictly massless, but this is an experimental question. If the photon is not a strictly massless particle, it would not move at the exact speed of light in vacuum, c . Its speed would be lower and depend on its frequency. Relativity would be unaffected by this; the so-called speed of light, c , would then not be the actual speed at which light moves, but a constant of nature which is the maximum speed that any object could theoretically attain in space-time. [21] Thus, it would still be the speed of space-time ripples (gravitational waves and gravitons), but it would not be the speed of photons.

A massive photon would have other effects as well. Coulomb's law would be modified and the electromagnetic field would have an extra physical degree of freedom. These effects yield more sensitive experimental probes of the photon mass than the frequency dependence of the speed of light. If Coulomb's law is not exactly valid, then that would cause the presence of an electric field inside a hollow conductor when it is subjected to an external electric field. This thus allows one to test Coulomb's law to very high precision. [22] A null result of such an experiment has set a limit of $m \leq 10^{-14} \text{ eV}/c^2$. [23]

Sharper upper limits have been obtained in experiments designed to detect effects caused by the galactic vector potential. Although the galactic vector potential is very large because the galactic magnetic field exists on very long

length scales, only the magnetic field is observable if the photon is massless. In case of a massive photon, the mass term would affect the galactic plasma. The fact that no such effects are seen implies an upper bound on the photon mass of $m \leq 3 \times 10^{-27} \text{ eV}/c^2$. [24] The galactic vector potential can also be probed directly by measuring the torque exerted on a magnetized ring. [25] Such methods were used to obtain the sharper upper limit of $10^{-18} \text{ eV}/c^2$ (the equivalent of 1.07×10^{-27} atomic mass units) given by the Particle Data Group. [26]

These sharp limits from the non-observation of the effects caused by the galactic vector potential have been shown to be model dependent. [27] If the photon mass is generated via the Higgs mechanism then the upper limit of $m \leq 10^{-14} \text{ eV}/c^2$ from the test of Coulomb's law is valid.

Photons inside superconductors do develop a nonzero effective rest mass; as a result, electromagnetic forces become short-range inside superconductors. [28]
[edit] Historical development

In most theories up to the eighteenth century, light was pictured as being made up of particles. Since particle models cannot easily account for the refraction, diffraction and birefringence of light, wave theories of light were proposed by René Descartes (1637), [29] Robert Hooke (1665), [30] and Christian Huygens (1678); [31] however, particle models remained dominant, chiefly due to the influence of Isaac Newton. [32] In the early nineteenth century, Thomas Young and August Fresnel clearly demonstrated the interference and diffraction of light and by 1850 wave models were generally accepted. [33] In 1865, James Clerk Maxwell's prediction [34] that light was an electromagnetic wave which was confirmed experimentally in 1888 by Heinrich Hertz's detection of radio waves [35] seemed to be the final blow to particle models of light.

The Maxwell wave theory, however, does not account for all properties of light. The Maxwell theory predicts that the energy of a light wave depends only on its intensity, not on its frequency; nevertheless, several independent types of experiments show that the energy imparted by light to atoms depends only on the light's frequency, not on its intensity. For example, some chemical reactions are provoked only by light of frequency higher than a certain threshold; light of frequency lower than the threshold, no matter how intense, does not initiate the reaction. Similarly, electrons can be ejected from a metal plate by shining light of sufficiently high frequency on it (the photoelectric effect); the energy of the ejected electron is related only to the light's frequency, not to its intensity. [36] [Note 3]

At the same time, investigations of blackbody radiation carried out over four decades (1860–1900) by various researchers [37] culminated in Max Planck's hypothesis [4] [38] that the energy of any system that absorbs or emits electromagnetic radiation of frequency ν is an integer multiple of an energy quantum $E = h\nu$. As shown by Albert Einstein, [5] [39] some form of energy quantization must be assumed to account for the thermal equilibrium observed between matter and electromagnetic radiation; for this explanation of the photoelectric effect, Einstein received the 1921 Nobel Prize in physics. [40]

Since the Maxwell theory of light allows for all possible energies of electromagnetic radiation, most physicists assumed initially that the energy quantization resulted from some unknown constraint on the matter that absorbs or emits the radiation. In 1905, Einstein was the first to propose that energy quantization was a property of electromagnetic radiation itself. [5] Although he accepted the validity of Maxwell's theory, Einstein pointed out that many anomalous experiments could be explained if the energy of a Maxwellian light wave were localized into point-like quanta that move independently of one another, even if the wave itself is spread continuously over space. [5] In 1909 [39] and 1916, [41] Einstein showed that, if Planck's law of black-body radiation is accepted, the energy quanta must also carry momentum $p = h/\lambda$, making them full-fledged particles. This photon momentum was observed experimentally [42] by Arthur Compton, for which he received the Nobel Prize in 1927. The pivotal question was then: how to unify Maxwell's wave theory of light with its experimentally observed particle nature? The answer to this

question occupied Albert Einstein for the rest of his life,[43] and was solved in quantum electrodynamics and its successor, the Standard Model (see Second quantization and The photon as a gauge boson, below).

[edit] Early objections

Einstein's 1905 predictions were verified experimentally in several ways in the first two decades of the 20th century, as recounted in Robert Millikan's Nobel lecture.[44] However, before Compton's experiment[42] showing that photons carried momentum proportional to their wave number (or frequency) (1922), most physicists were reluctant to believe that electromagnetic radiation itself might be particulate. (See, for example, the Nobel lectures of Wien,[37] Planck[38] and Millikan.[44]). Instead, there was a widespread belief that energy quantization resulted from some unknown constraint on the matter that absorbs or emits radiation. Attitudes changed over time. In part, the change can be traced to experiments such as Compton scattering, where it was much more difficult not to ascribe quantization to light itself to explain the observed results.[45]

Even after Compton's experiment, Niels Bohr, Hendrik Kramers and John Slater made one last attempt to preserve the Maxwellian continuous electromagnetic field model of light, the so-called BKS model.[46] To account for the data then available, two drastic hypotheses had to be made:

Energy and momentum are conserved only on the average in interactions between matter and radiation, not in elementary processes such as absorption and emission. This allows one to reconcile the discontinuously changing energy of the atom (jump between energy states) with the continuous release of energy into radiation.

Causality is abandoned. For example, spontaneous emissions are merely emissions induced by a "virtual" electromagnetic field.

However, refined Compton experiments showed that energy-momentum is conserved extraordinarily well in elementary processes; and also that the jolting of the electron and the generation of a new photon in Compton scattering obey causality to within 10 ps. Accordingly, Bohr and his co-workers gave their model "as honorable a funeral as possible".[43] Nevertheless, the failures of the BKS model inspired Werner Heisenberg in his development of matrix mechanics.[47]

A few physicists persisted[48] in developing semiclassical models in which electromagnetic radiation is not quantized, but matter appears to obey the laws of quantum mechanics. Although the evidence for photons from chemical and physical experiments was overwhelming by the 1970s, this evidence could not be considered as absolutely definitive; since it relied on the interaction of light with matter, a sufficiently complicated theory of matter could in principle account for the evidence. Nevertheless, all semiclassical theories were refuted definitively in the 1970s and 1980s by photon-correlation experiments.[Note 4] Hence, Einstein's hypothesis that quantization is a property of light itself is considered to be proven.

[edit] Wave-particle duality and uncertainty principles

Photons, like all quantum objects, exhibit both wave-like and particle-like properties. Their dual wave-particle nature can be difficult to visualize. The photon displays clearly wave-like phenomena such as diffraction and interference on the length scale of its wavelength. For example, a single photon passing through a double-slit experiment lands on the screen exhibiting interference phenomena but only if no measure was made on the actual slit being run across. To account for the particle interpretation that phenomenon is called probability distribution but behaves according to Maxwell's equations.[49] However, experiments confirm that the photon is not a short pulse of electromagnetic radiation; it does not spread out as it propagates, nor does it divide when it encounters a beam splitter.[50] Rather, the photon seems to be a point-like particle since it is absorbed or emitted as a whole by arbitrarily small systems, systems much smaller than its wavelength, such as an atomic nucleus ($\sim 10^{-15}$ m across) or even the point-like electron. Nevertheless, the photon is not a point-like particle whose trajectory is shaped

probabilistically by the electromagnetic field, as conceived by Einstein and others; that hypothesis was also refuted by the photon-correlation experiments cited above. According to our present understanding, the electromagnetic field itself is produced by photons, which in turn result from a local gauge symmetry and the laws of quantum field theory (see the Second quantization and Gauge boson sections below).

A key element of quantum mechanics is Heisenberg's uncertainty principle, which forbids the simultaneous measurement of the position and momentum of a particle along the same direction. Remarkably, the uncertainty principle for charged, material particles requires the quantization of light into photons, and even the frequency dependence of the photon's energy and momentum. An elegant illustration is Heisenberg's thought experiment for locating an electron with an ideal microscope.[51] The position of the electron can be determined to within the resolving power of the microscope, which is given by a formula from classical optics

where θ is the aperture angle of the microscope. Thus, the position uncertainty can be made arbitrarily small by reducing the wavelength λ . The momentum of the electron is uncertain, since it received a "kick" from the light scattering from it into the microscope. If light were not quantized into photons, the uncertainty could be made arbitrarily small by reducing the light's intensity. In that case, since the wavelength and intensity of light can be varied independently, one could simultaneously determine the position and momentum to arbitrarily high accuracy, violating the uncertainty principle. By contrast, Einstein's formula for photon momentum preserves the uncertainty principle; since the photon is scattered anywhere within the aperture, the uncertainty of momentum transferred equals

giving the product $\Delta x \Delta p \geq \hbar/2$, which is Heisenberg's uncertainty principle. Thus, the entire world is quantized; both matter and fields must obey a consistent set of quantum laws, if either one is to be quantized.[52]

The analogous uncertainty principle for photons forbids the simultaneous measurement of the number of photons (see Fock state and the Second quantization section below) in an electromagnetic wave and the phase of that wave

See coherent state and squeezed coherent state for more details.

Both photons and material particles such as electrons create analogous interference patterns when passing through a double-slit experiment. For photons, this corresponds to the interference of a Maxwell light wave whereas, for material particles, this corresponds to the interference of the Schrödinger wave equation. Although this similarity might suggest that Maxwell's equations are simply Schrödinger's equation for photons, most physicists do not agree.[53][54] For one thing, they are mathematically different; most obviously, Schrödinger's one equation solves for a complex field, whereas Maxwell's four equations solve for real fields. More generally, the normal concept of a Schrödinger probability wave function cannot be applied to photons.[55] Being massless, they cannot be localized without being destroyed; technically, photons cannot have a position eigenstate, and, thus, the normal Heisenberg uncertainty principle does not pertain to photons. A few substitute wave functions have been suggested for the photon,[56][57][58][59] but they have not come into general use. Instead, physicists generally accept the second-quantized theory of photons described below, quantum electrodynamics, in which photons are quantized excitations of electromagnetic modes.

[edit] Bose-Einstein model of a photon gas

In 1924, Satyendra Nath Bose derived Planck's law of black-body radiation without using any electromagnetism, but rather a modification of coarse-grained counting of phase space.[60] Einstein showed that this modification is equivalent to assuming that photons are rigorously identical and that it implied a "mysterious non-local interaction",[61][62] now understood as the

requirement for a symmetric quantum mechanical state. This work led to the concept of coherent states and the development of the laser. In the same papers, Einstein extended Bose's formalism to material particles (bosons) and predicted that they would condense into their lowest quantum state at low enough temperatures; this Bose-Einstein condensation was observed experimentally in 1995.[63] It was later used by Lene Hau to slow, and then completely stop, light in 1999[64] and 2001.[65]

The modern view on this is that photons are, by virtue of their integer spin, bosons (as opposed to fermions with half-integer spin). By the spin-statistics theorem, all bosons obey Bose-Einstein statistics (whereas all fermions obey Fermi-Dirac statistics).[66]

[edit] Stimulated and spontaneous emission

In 1916, Einstein showed that Planck's radiation law could be derived from a semi-classical, statistical treatment of photons and atoms, which implies a relation between the rates at which atoms emit and absorb photons. The condition follows from the assumption that light is emitted and absorbed by atoms independently, and that the thermal equilibrium is preserved by interaction with atoms. Consider a cavity in thermal equilibrium and filled with electromagnetic radiation and atoms that can emit and absorb that radiation. Thermal equilibrium requires that the energy density of photons with frequency (which is proportional to their number density) is, on average, constant in time; hence, the rate at which photons of any particular frequency are emitted must equal the rate of absorbing them.[67]

Einstein began by postulating simple proportionality relations for the different reaction rates involved. In his model, the rate for a system to absorb a photon of frequency and transition from a lower energy to a higher energy is proportional to the number of atoms with energy and to the energy density of ambient photons with that frequency,

where A_{ji} is the rate constant for absorption. For the reverse process, there are two possibilities: spontaneous emission of a photon, and a return to the lower-energy state that is initiated by the interaction with a passing photon. Following Einstein's approach, the corresponding rate for the emission of photons of frequency and transition from a higher energy to a lower energy is

where A_{ji} is the rate constant for emitting a photon spontaneously, and B_{ji} is the rate constant for emitting it in response to ambient photons (induced or stimulated emission). In thermodynamic equilibrium, the number of atoms in state i and that of atoms in state j must, on average, be constant; hence, the rates must be equal. Also, by arguments analogous to the derivation of Boltzmann statistics, the ratio of N_i and N_j is where g_i and g_j are the degeneracy of the state i and that of j , respectively, their energies, k the Boltzmann constant and T the system's temperature. From this, it is readily derived that and

The A and B s are collectively known as the Einstein coefficients.[68]

Einstein could not fully justify his rate equations, but claimed that it should be possible to calculate the coefficients, and once physicists had obtained "mechanics and electrodynamics modified to accommodate the quantum hypothesis".[69] In fact, in 1926, Paul Dirac derived the rate constants in using a semiclassical approach,[70] and, in 1927, succeeded in deriving all the rate constants from first principles within the framework of quantum theory.[71][72] Dirac's work was the foundation of quantum electrodynamics, i.e., the quantization of the electromagnetic field itself. Dirac's approach is also called second quantization or quantum field theory;[73][74][75] earlier quantum mechanical treatments only treat material particles as quantum mechanical, not the electromagnetic field.

Einstein was troubled by the fact that his theory seemed incomplete, since it did not determine the direction of a spontaneously emitted photon. A probabilistic nature of light-particle motion was first considered by Newton in his treatment of birefringence and, more generally, of the splitting of light

beams at interfaces into a transmitted beam and a reflected beam. Newton hypothesized that hidden variables in the light particle determined which path it would follow.[32] Similarly, Einstein hoped for a more complete theory that would leave nothing to chance, beginning his separation[43] from quantum mechanics. Ironically, Max Born's probabilistic interpretation of the wave function[76][77] was inspired by Einstein's later work searching for a more complete theory.[78]

[edit] Second quantization

In 1910, Peter Debye derived Planck's law of black-body radiation from a relatively simple assumption.[79] He correctly decomposed the electromagnetic field in a cavity into its Fourier modes, and assumed that the energy in any mode was an integer multiple of $h\nu$, where ν is the frequency of the electromagnetic mode. Planck's law of black-body radiation follows immediately as a geometric sum. However, Debye's approach failed to give the correct formula for the energy fluctuations of blackbody radiation, which were derived by Einstein in 1909.[39]

In 1925, Born, Heisenberg and Jordan reinterpreted Debye's concept in a key way.[80] As may be shown classically, the Fourier modes of the electromagnetic field are a complete set of electromagnetic plane waves indexed by their wave vector \mathbf{k} and polarization state are equivalent to a set of uncoupled simple harmonic oscillators. Treated quantum mechanically, the energy levels of such oscillators are known to be $(n + \frac{1}{2})h\nu$, where ν is the oscillator frequency. The key new step was to identify an electromagnetic mode with energy as a state with photons, each of energy $h\nu$. This approach gives the correct energy fluctuation formula.

Dirac took this one step further.[71][72] He treated the interaction between a charge and an electromagnetic field as a small perturbation that induces transitions in the photon states, changing the numbers of photons in the modes, while conserving energy and momentum overall. Dirac was able to derive Einstein's coefficients from first principles, and showed that the Bose-Einstein statistics of photons is a natural consequence of quantizing the electromagnetic field correctly (Bose's reasoning went in the opposite direction; he derived Planck's law of black body radiation by assuming Bose-Einstein statistics). In Dirac's time, it was not yet known that all bosons, including photons, must obey Bose-Einstein statistics.

Dirac's second-order perturbation theory can involve virtual photons, transient intermediate states of the electromagnetic field; the static electric and magnetic interactions are mediated by such virtual photons. In such quantum field theories, the probability amplitude of observable events is calculated by summing over all possible intermediate steps, even ones that are unphysical; hence, virtual photons are not constrained to satisfy $E = pc$, and may have extra polarization states; depending on the gauge used, virtual photons may have three or four polarization states, instead of the two states of real photons. Although these transient virtual photons can never be observed, they contribute measurably to the probabilities of observable events. Indeed, such second-order and higher-order perturbation calculations can give apparently infinite contributions to the sum. Such unphysical results are corrected for using the technique of renormalization. Other virtual particles may contribute to the summation as well; for example, two photons may interact indirectly through virtual electron-positron pairs.[81] In fact, such photon-photon scattering, as well as electron-photon scattering, is meant to be one of the modes of operations of the planned particle accelerator, the International Linear Collider.[82]

In modern physics notation, the quantum state of the electromagnetic field is written as a Fock state, a tensor product of the states for each electromagnetic mode

where $|n\rangle$ represents the state in which photons are in the mode \mathbf{k} . In this notation, the creation of a new photon in mode \mathbf{k} (e.g., emitted from an atomic transition) is written as $a_{\mathbf{k}}^\dagger |n\rangle$. This notation merely expresses the concept of Born,

Heisenberg and Jordan described above, and does not add any physics.

[edit] The photon as a gauge boson

Main article: Gauge theory

The electromagnetic field can be understood as a gauge field, i.e., as a field that results from requiring that a gauge symmetry holds independently at every position in spacetime.[83] For the electromagnetic field, this gauge symmetry is the Abelian $U(1)$ symmetry of a complex number, which reflects the ability to vary the phase of a complex number without affecting observables or real valued functions made from it, such as the energy or the Lagrangian.

The quanta of an Abelian gauge field must be massless, uncharged bosons, as long as the symmetry is not broken; hence, the photon is predicted to be massless, and to have zero electric charge and integer spin. The particular form of the electromagnetic interaction specifies that the photon must have spin ± 1 ; thus, its helicity must be ± 1 . These two spin components correspond to the classical concepts of right-handed and left-handed circularly polarized light. However, the transient virtual photons of quantum electrodynamics may also adopt unphysical polarization states.[83]

In the prevailing Standard Model of physics, the photon is one of four gauge bosons in the electroweak interaction; the other three are denoted W^+ , W^- and Z^0 and are responsible for the weak interaction. Unlike the photon, these gauge bosons have mass, owing to a mechanism that breaks their $SU(2)$ gauge symmetry. The unification of the photon with W and Z gauge bosons in the electroweak interaction was accomplished by Sheldon Glashow, Abdus Salam and Steven Weinberg, for which they were awarded the 1979 Nobel Prize in physics.[84][85][86] Physicists continue to hypothesize grand unified theories that connect these four gauge bosons with the eight gluon gauge bosons of quantum chromodynamics; however, key predictions of these theories, such as proton decay, have not been observed experimentally.[87]

[edit] Contributions to the mass of a system

The energy of a system that emits a photon is decreased by the energy of the photon as measured in the rest frame of the emitting system, which may result in a reduction in mass in the amount E/c^2 . Similarly, the mass of a system that absorbs a photon is increased by a corresponding amount. As an application, the energy balance of nuclear reactions involving photons is commonly written in terms of the masses of the nuclei involved, and terms of the form E/c^2 for the gamma photons (and for other relevant energies, such as the recoil energy of nuclei).[88]

This concept is applied in key predictions of quantum electrodynamics (QED, see above). In that theory, the mass of electrons (or, more generally, leptons) is modified by including the mass contributions of virtual photons, in a technique known as renormalization. Such "radiative corrections" contribute to a number of predictions of QED, such as the magnetic dipole moment of leptons, the Lamb shift, and the hyperfine structure of bound lepton pairs, such as muonium and positronium.[89]

Since photons contribute to the stress-energy tensor, they exert a gravitational attraction on other objects, according to the theory of general relativity. Conversely, photons are themselves affected by gravity; their normally straight trajectories may be bent by warped spacetime, as in gravitational lensing, and their frequencies may be lowered by moving to a higher gravitational potential, as in the Pound-Rebka experiment. However, these effects are not specific to photons; exactly the same effects would be predicted for classical electromagnetic waves.[90]

[edit] Photons in matter

Light that travels through transparent matter does so at a lower speed than c , the speed of light in a vacuum. In addition, light can also undergo scattering and absorption. There are circumstances in which heat transfer through a material is mostly radiative, involving emission and absorption of photons within it. An example would be in the core of the Sun. Energy can take about a million years to reach the surface.[91] However, this phenomenon is distinct from scattered radiation passing diffusely through matter, as it involves local

equilibration between the radiation and the temperature. Thus, the time is how long it takes the energy to be transferred, not the photons themselves. Once in open space, a photon from the Sun takes only 8.3 minutes to reach Earth. The factor by which the speed of light is decreased in a material is called the refractive index of the material. In a classical wave picture, the slowing can be explained by the light inducing electric polarization in the matter, the polarized matter radiating new light, and the new light interfering with the original light wave to form a delayed wave. In a particle picture, the slowing can instead be described as a blending of the photon with quantum excitations of the matter (quasi-particles such as phonons and excitons) to form a polariton; this polariton has a nonzero effective mass, which means that it cannot travel at c .

Alternatively, photons may be viewed as always traveling at c , even in matter, but they have their phase shifted (delayed or advanced) upon interaction with atomic scatters: this modifies their wavelength and momentum, but not speed.[92] A light wave made up of these photons does travel slower than the speed of light. In this view the photons are "bare", and are scattered and phase shifted, while in the view of the preceding paragraph the photons are "dressed" by their interaction with matter, and move without scattering or phase shifting, but at a lower speed.

Light of different frequencies may travel through matter at different speeds; this is called dispersion. In some cases, it can result in extremely slow speeds of light in matter. The effects of photon interactions with other quasi-particles may be observed directly in Raman scattering and Brillouin scattering.[93]

Photons can also be absorbed by nuclei, atoms or molecules, provoking transitions between their energy levels. A classic example is the molecular transition of retinal C₂₀H₂₈O, which is responsible for vision, as discovered in 1958 by Nobel laureate biochemist George Wald and co-workers. The absorption provokes a cis-trans isomerization that, in combination with other such transitions, is transduced into nerve impulses. The absorption of photons can even break chemical bonds, as in the photodissociation of chlorine; this is the subject of photochemistry.[94][95] Analogously, gamma rays can in some circumstances dissociate atomic nuclei in a process called photodisintegration.

[edit] Technological applications

Photons have many applications in technology. These examples are chosen to illustrate applications of photons per se, rather than general optical devices such as lenses, etc. that could operate under a classical theory of light. The laser is an extremely important application and is discussed above under stimulated emission.

Individual photons can be detected by several methods. The classic photomultiplier tube exploits the photoelectric effect: a photon landing on a metal plate ejects an electron, initiating an ever-amplifying avalanche of electrons. Charge-coupled device chips use a similar effect in semiconductors: an incident photon generates a charge on a microscopic capacitor that can be detected. Other detectors such as Geiger counters use the ability of photons to ionize gas molecules, causing a detectable change in conductivity.[96]

Planck's energy formula is often used by engineers and chemists in design, both to compute the change in energy resulting from a photon absorption and to predict the frequency of the light emitted for a given energy transition. For example, the emission spectrum of a fluorescent light bulb can be designed using gas molecules with different electronic energy levels and adjusting the typical energy with which an electron hits the gas molecules within the bulb.[Note 5]

Under some conditions, an energy transition can be excited by "two" photons that individually would be insufficient. This allows for higher resolution microscopy, because the sample absorbs energy only in the region where two beams of different colors overlap significantly, which can be made much smaller than the excitation volume of a single beam (see two-photon excitation microscopy). Moreover, these photons cause less damage to the sample, since

they are of lower energy.[97]

In some cases, two energy transitions can be coupled so that, as one system absorbs a photon, another nearby system "steals" its energy and re-emits a photon of a different frequency. This is the basis of fluorescence resonance energy transfer, a technique that is used in molecular biology to study the interaction of suitable proteins.[98]

Several different kinds of hardware random number generator involve the detection of single photons. In one example, for each bit in the random sequence that is to be produced, a photon is sent to a beam-splitter. In such a situation, there are two possible outcomes of equal probability. The actual outcome is used to determine whether the next bit in the sequence is "0" or "1".[99][100]

[edit] Recent research

Much research has been devoted to applications of photons in the field of quantum optics. Photons seem well-suited to be elements of an extremely fast quantum computer, and the quantum entanglement of photons is a focus of research. Nonlinear optical processes are another active research area, with topics such as two-photon absorption, self-phase modulation, modulational instability and optical parametric oscillators. However, such processes generally do not require the assumption of photons per se; they may often be modeled by treating atoms as nonlinear oscillators. The nonlinear process of spontaneous parametric down conversion is often used to produce single-photon states. Finally, photons are essential in some aspects of optical communication, especially for quantum cryptography.[Note 6]

[edit] See also

^ Although the 1967 Elsevier translation of Planck's Nobel Lecture interprets Planck's *Lichtquant* as "photon", the more literal 1922 translation by Hans Thacher Clarke and Ludwik Silberstein *The origin and development of the quantum theory*, The Clarendon Press, 1922 (here [1]) uses "light-quantum". No evidence is known that Planck himself used the term "photon" by 1926 (see also this note).

^ The mass of the photon is believed to be exactly zero, based on experiment and theoretical considerations described in the article. Some sources also refer to the relativistic mass concept, which is just the energy scaled to units of mass. For a photon with wavelength λ or energy E , this is $h/\lambda c$ or E/c^2 . This usage for the term "mass" is no longer common in scientific literature. Further info: What is the mass of a photon?

http://math.ucr.edu/home/baez/physics/ParticleAndNuclear/photon_mass.html

^ The phrase "no matter how intense" refers to intensities below approximately 10^{13} W/cm² at which point perturbation theory begins to break down. In contrast, in the intense regime, which for visible light is above approximately 10^{14} W/cm², the classical wave description correctly predicts the energy acquired by electrons, called ponderomotive energy. (See also: Boreham et al. (1996). "Photon density and the correspondence principle of electromagnetic interaction".) By comparison, sunlight is only about 0.1 W/cm².

^ These experiments produce results that cannot be explained by any classical theory of light, since they involve anticorrelations that result from the quantum measurement process. In 1974, the first such experiment was carried out by Clauser, who reported a violation of a classical Cauchy-Schwarz inequality. In 1977, Kimble et al. demonstrated an analogous anti-bunching effect of photons interacting with a beam splitter; this approach was simplified and sources of error eliminated in the photon-anticorrelation experiment of Grangier et al. (1986). This work is reviewed and simplified further in Thorn et al. (2004). (These references are listed below under Additional references.)

^ An example is US Patent Nr. 5212709.

^ Introductory-level material on the various sub-fields of quantum optics can be found in Fox, M. (2006). *Quantum Optics: An Introduction*. Oxford University Press. ISBN 0-19-856673-5.

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Alzheimer's disease (AD), also known in medical literature as Alzheimer disease, is the most common form of dementia. There is no cure for the disease, which worsens as it progresses, and eventually leads to death. It was first described by German psychiatrist and neuropathologist Alois Alzheimer in 1906 and was named after him.[1] Most often, AD is diagnosed in people over 65Â years of age,[2] although the less-prevalent early-onset Alzheimer's can occur much earlier. In 2006, there were 26.6 million sufferers worldwide. Alzheimer's is predicted to affect 1 in 85 people globally by 2050.[3]

Although Alzheimer's disease develops differently for every individual, there are many common symptoms.[4] Early symptoms are often mistakenly thought to be 'age-related' concerns, or manifestations of stress.[5] In the early stages, the most common symptom is difficulty in remembering recent events. When AD is suspected, the diagnosis is usually confirmed with tests that evaluate behaviour and thinking abilities, often followed by a brain scan if available.[6] As the disease advances, symptoms can include confusion, irritability and aggression, mood swings, trouble with language, and long-term memory loss. As the sufferer declines they often withdraw from family and society.[5][7] Gradually, bodily functions are lost, ultimately leading to death.[8] Since the disease is different for each individual, predicting how it will affect the person is difficult. AD develops for an unknown and variable amount of time before becoming fully apparent, and it can progress undiagnosed for years. On average, the life expectancy following diagnosis is approximately seven years.[9] Fewer than three percent of individuals live more than fourteen

years after diagnosis.[10]

The cause and progression of Alzheimer's disease are not well understood. Research indicates that the disease is associated with plaques and tangles in the brain.[11] Current treatments only help with the symptoms of the disease. There are no available treatments that stop or reverse the progression of the disease. As of 2012[update], more than 1000 clinical trials have been or are being conducted to find ways to treat the disease, but it is unknown if any of the tested treatments will work.[12] Mental stimulation, exercise, and a balanced diet have been suggested as ways to delay cognitive symptoms (though not brain pathology) in healthy older individuals, but there is no conclusive evidence supporting an effect.[13]

Because AD cannot be cured and is degenerative, the sufferer relies on others for assistance. The role of the main caregiver is often taken by the spouse or a close relative.[14] Alzheimer's disease is known for placing a great burden on caregivers; the pressures can be wide-ranging, involving social, psychological, physical, and economic elements of the caregiver's life.[15][16][17] In developed countries, AD is one of the most costly diseases to society.[18][19]

Characteristics

The disease course is divided into four stages, with progressive patterns of cognitive and functional impairments.

Pre-dementia

The first symptoms are often mistakenly attributed to ageing or stress.[5] Detailed neuropsychological testing can reveal mild cognitive difficulties up to eight years before a person fulfils the clinical criteria for diagnosis of AD.[20] These early symptoms can affect the most complex daily living activities.[21] The most noticeable deficit is memory loss, which shows up as difficulty in remembering recently learned facts and inability to acquire new information.[20][22]

Subtle problems with the executive functions of attentiveness, planning, flexibility, and abstract thinking, or impairments in semantic memory (memory of meanings, and concept relationships) can also be symptomatic of the early stages of AD.[20] Apathy can be observed at this stage, and remains the most persistent neuropsychiatric symptom throughout the course of the disease.[23] The preclinical stage of the disease has also been termed mild cognitive impairment,[22] but whether this term corresponds to a different diagnostic stage or identifies the first step of AD is a matter of dispute.[24]

Early

In people with AD the increasing impairment of learning and memory eventually leads to a definitive diagnosis. In a small portion of them, difficulties with language, executive functions, perception (agnosia), or execution of movements (apraxia) are more prominent than memory problems.[25] AD does not affect all memory capacities equally. Older memories of the person's life (episodic memory), facts learned (semantic memory), and implicit memory (the memory of the body on how to do things, such as using a fork to eat) are affected to a lesser degree than new facts or memories.[26][27]

Language problems are mainly characterised by a shrinking vocabulary and decreased word fluency, which lead to a general impoverishment of oral and written language.[25][28] In this stage, the person with Alzheimer's is usually capable of communicating basic ideas adequately.[25][28][29] While performing fine motor tasks such as writing, drawing or dressing, certain movement coordination and planning difficulties (apraxia) may be present but they are commonly unnoticed.[25] As the disease progresses, people with AD can often continue to perform many tasks independently, but may need assistance or supervision with the most cognitively demanding activities.[25]

Moderate

Progressive deterioration eventually hinders independence, with subjects being unable to perform most common activities of daily living.[25] Speech difficulties become evident due to an inability to recall vocabulary, which leads to frequent incorrect word substitutions (paraphasias). Reading and

writing skills are also progressively lost.[25][29] Complex motor sequences become less coordinated as time passes and AD progresses, so the risk of falling increases.[25] During this phase, memory problems worsen, and the person may fail to recognise close relatives.[25] Long-term memory, which was previously intact, becomes impaired.[25]

Behavioural and neuropsychiatric changes become more prevalent. Common manifestations are wandering, irritability and labile affect, leading to crying, outbursts of unpremeditated aggression, or resistance to caregiving.[25] Sundowning can also appear.[30] Approximately 30% of people with AD develop illusionary misidentifications and other delusional symptoms.[25] Subjects also lose insight of their disease process and limitations (anosognosia).[25] Urinary incontinence can develop.[25] These symptoms create stress for relatives and caretakers, which can be reduced by moving the person from home care to other long-term care facilities.[25][31]

Advanced

During the final stage of AD, the person is completely dependent upon caregivers.[25] Language is reduced to simple phrases or even single words, eventually leading to complete loss of speech.[25][29] Despite the loss of verbal language abilities, people can often understand and return emotional signals.[25] Although aggressiveness can still be present, extreme apathy and exhaustion are much more common results.[25] People with AD will ultimately not be able to perform even the simplest tasks without assistance.[25] Muscle mass and mobility deteriorate to the point where they are bedridden, and they lose the ability to feed themselves.[25] AD is a terminal illness, with the cause of death typically being an external factor, such as infection of pressure ulcers or pneumonia, not the disease itself.[25]

Cause

The cause for most Alzheimer's cases is still essentially unknown[32][33] (except for 1% to 5% of cases where genetic differences have been identified). Several competing hypotheses exist trying to explain the cause of the disease:

Cholinergic hypothesis

The oldest, on which most currently available drug therapies are based, is the cholinergic hypothesis,[34] which proposes that AD is caused by reduced synthesis of the neurotransmitter acetylcholine. The cholinergic hypothesis has not maintained widespread support, largely because medications intended to treat acetylcholine deficiency have not been very effective. Other cholinergic effects have also been proposed, for example, initiation of large-scale aggregation of amyloid,[35] leading to generalised neuroinflammation.[36]

Amyloid hypothesis

In 1991, the amyloid hypothesis postulated that beta-amyloid ($A\beta$) deposits are the fundamental cause of the disease.[37][38] Support for this postulate comes from the location of the gene for the amyloid precursor protein (APP) on chromosome 21, together with the fact that people with trisomy 21 (Down Syndrome) who have an extra gene copy almost universally exhibit AD by 40 years of age.[39][40] Also, a specific isoform of apolipoprotein, APOE4, is a major genetic risk factor for AD. Whilst apolipoproteins enhance the break down of beta amyloid, some isoforms are not very effective at this task (such as APOE4), leading to excess amyloid buildup in the brain.[41] Further evidence comes from the finding that transgenic mice that express a mutant form of the human APP gene develop fibrillar amyloid plaques and Alzheimer's-like brain pathology with spatial learning deficits.[42]

An experimental vaccine was found to clear the amyloid plaques in early human trials, but it did not have any significant effect on dementia.[43] Researchers have been led to suspect non-plaque $A\beta$ oligomers (aggregates of many monomers) as the primary pathogenic form of $A\beta$. These toxic oligomers, also referred to as amyloid-derived diffusible ligands (ADDLs), bind to a surface receptor on neurons and change the structure of the synapse, thereby disrupting neuronal communication.[44] One receptor for $A\beta$ oligomers may be the prion protein, the same protein that has been linked to mad cow disease and the related human condition, Creutzfeldt-Jakob disease, thus potentially linking the underlying

mechanism of these neurodegenerative disorders with that of Alzheimer's disease.[45]

In 2009, this theory was updated, suggesting that a close relative of the beta-amyloid protein, and not necessarily the beta-amyloid itself, may be a major culprit in the disease. The theory holds that an amyloid-related mechanism that prunes neuronal connections in the brain in the fast-growth phase of early life may be triggered by ageing-related processes in later life to cause the neuronal withering of Alzheimer's disease.[46] N-APP, a fragment of APP from the peptide's N-terminus, is adjacent to beta-amyloid and is cleaved from APP by one of the same enzymes. N-APP triggers the self-destruct pathway by binding to a neuronal receptor called death receptor 6 (DR6, also known as TNFRSF21).[46] DR6 is highly expressed in the human brain regions most affected by Alzheimer's, so it is possible that the N-APP/DR6 pathway might be hijacked in the ageing brain to cause damage. In this model, beta-amyloid plays a complementary role, by depressing synaptic function.

Tau hypothesis

The tau hypothesis is the idea that tau protein abnormalities initiate the disease cascade.[38] In this model, hyperphosphorylated tau begins to pair with other threads of tau. Eventually, they form neurofibrillary tangles inside nerve cell bodies.[47] When this occurs, the microtubules disintegrate, collapsing the neuron's transport system.[48] This may result first in malfunctions in biochemical communication between neurons and later in the death of the cells.[49]

Other hypotheses

Herpes simplex virus type 1 has also been proposed to play a causative role in people carrying the susceptible versions of the apoE gene.[50]

Another hypothesis asserts that the disease may be caused by age-related myelin breakdown in the brain. Iron released during myelin breakdown is hypothesised to cause further damage. Homeostatic myelin repair processes contribute to the development of proteinaceous deposits such as beta-amyloid and tau.[51][52][53]

Oxidative stress and dys-homeostasis of biometal (biology) metabolism may be significant in the formation of the pathology.[54][55]

AD individuals show 70% loss of locus coeruleus cells that provide norepinephrine (in addition to its neurotransmitter role) that locally diffuses from "varicosities" as an endogenous antiinflammatory agent in the microenvironment around the neurons, glial cells, and blood vessels in the neocortex and hippocampus.[56] It has been shown that norepinephrine stimulates mouse microglia to suppress $\text{Î}^2\text{A}$ -induced production of cytokines and their phagocytosis of $\text{Î}^2\text{A}$. [56] This suggests that degeneration of the locus ceruleus might be responsible for increased $\text{Î}^2\text{A}$ deposition in AD brains.[56]

Pathophysiology

Neuropathology

Alzheimer's disease is characterised by loss of neurons and synapses in the cerebral cortex and certain subcortical regions. This loss results in gross atrophy of the affected regions, including degeneration in the temporal lobe and parietal lobe, and parts of the frontal cortex and cingulate gyrus.[36] Studies using MRI and PET have documented reductions in the size of specific brain regions in people with AD as they progressed from mild cognitive impairment to Alzheimer's disease, and in comparison with similar images from healthy older adults.[57][58]

Both amyloid plaques and neurofibrillary tangles are clearly visible by microscopy in brains of those afflicted by AD.[11] Plaques are dense, mostly insoluble deposits of beta-amyloid peptide and cellular material outside and around neurons. Tangles (neurofibrillary tangles) are aggregates of the microtubule-associated protein tau which has become hyperphosphorylated and accumulate inside the cells themselves. Although many older individuals develop some plaques and tangles as a consequence of ageing, the brains of people with AD have a greater number of them in specific brain regions such as the temporal lobe.[59] Lewy bodies are not rare in the brains of people with AD.[60]

Biochemistry

Alzheimer's disease has been identified as a protein misfolding disease (proteopathy), caused by accumulation of abnormally folded amyloid beta and amyloid tau proteins in the brain.[61] Plaques are made up of small peptides, 39-43 amino acids in length, called beta-amyloid ($A\beta$). Beta-amyloid is a fragment from a larger protein called amyloid precursor protein (APP), a transmembrane protein that penetrates through the neuron's membrane. APP is critical to neuron growth, survival and post-injury repair.[62][63] In Alzheimer's disease, an unknown process causes APP to be divided into smaller fragments by enzymes through proteolysis.[64] One of these fragments gives rise to fibrils of beta-amyloid, which form clumps that deposit outside neurons in dense formations known as senile plaques.[11][65]

AD is also considered a tauopathy due to abnormal aggregation of the tau protein. Every neuron has a cytoskeleton, an internal support structure partly made up of structures called microtubules. These microtubules act like tracks, guiding nutrients and molecules from the body of the cell to the ends of the axon and back. A protein called tau stabilises the microtubules when phosphorylated, and is therefore called a microtubule-associated protein. In AD, tau undergoes chemical changes, becoming hyperphosphorylated; it then begins to pair with other threads, creating neurofibrillary tangles and disintegrating the neuron's transport system.[66]

Disease mechanism

Exactly how disturbances of production and aggregation of the beta-amyloid peptide gives rise to the pathology of AD is not known.[67] The amyloid hypothesis traditionally points to the accumulation of beta-amyloid peptides as the central event triggering neuron degeneration. Accumulation of aggregated amyloid fibrils, which are believed to be the toxic form of the protein responsible for disrupting the cell's calcium ion homeostasis, induces programmed cell death (apoptosis).[68] It is also known that $A\beta$ selectively builds up in the mitochondria in the cells of Alzheimer's-affected brains, and it also inhibits certain enzyme functions and the utilisation of glucose by neurons.[69]

Various inflammatory processes and cytokines may also have a role in the pathology of Alzheimer's disease. Inflammation is a general marker of tissue damage in any disease, and may be either secondary to tissue damage in AD or a marker of an immunological response.[70]

Alterations in the distribution of different neurotrophic factors and in the expression of their receptors such as the brain derived neurotrophic factor (BDNF) have been described in AD.[71][72]

Genetics

The vast majority of cases of Alzheimer's disease are sporadic, meaning that they are not genetically inherited although some genes may act as risk factors. On the other hand, around 0.1% of the cases are familial forms of autosomal dominant (not sex-linked) inheritance, which usually have an onset before age 65.[73] This form of the disease is known as early onset familial Alzheimer's disease.

Most of autosomal dominant familial AD can be attributed to mutations in one of three genes: amyloid precursor protein (APP) and presenilins 1 and 2.[74] Most mutations in the APP and presenilin genes increase the production of a small protein called $A\beta_{42}$, which is the main component of senile plaques.[75] Some of the mutations merely alter the ratio between $A\beta_{42}$ and the other major forms - e.g., $A\beta_{40}$ - without increasing $A\beta_{42}$ levels.[75][76] This suggests that presenilin mutations can cause disease even if they lower the total amount of $A\beta$ produced and may point to other roles of presenilin or a role for alterations in the function of APP and/or its fragments other than $A\beta$.

Most cases of Alzheimer's disease do not exhibit autosomal-dominant inheritance and are termed sporadic AD. Nevertheless genetic differences may act as risk factors. The best known genetic risk factor is the inheritance of the ϵ_4 allele of the apolipoprotein E (APOE).[77][78] Between 40 and 80% of people with AD possess at least one APOE ϵ_4 allele.[78] The APOE ϵ_4 allele

increases the risk of the disease by three times in heterozygotes and by 15 times in homozygotes.[73] However, this "genetic" effect is not necessarily purely genetic. For example, certain Nigerian populations have no relationship between presence or dose of APOE ϵ 4 and incidence or age-of-onset for Alzheimer's disease.[79][80] Geneticists agree that numerous other genes also act as risk factors or have protective effects that influence the development of late onset Alzheimer's disease,[74] but results such as the Nigerian studies and the incomplete penetrance for all genetic risk factors associated with sporadic Alzheimers indicate a strong role for environmental effects. Over 400 genes have been tested for association with late-onset sporadic AD,[74] most with null results.[73]

Mutation in the TREM2 gene have been associated with a 3 to 5 times higher risk of developing Alzheimer's disease.[81][82] A suggested mechanism of action is that when TREM2 is mutated, white blood cells in the brain are no longer able to control the amount of beta amyloid present.

Diagnosis

Alzheimer's disease is usually diagnosed clinically from the patient history, collateral history from relatives, and clinical observations, based on the presence of characteristic neurological and neuropsychological features and the absence of alternative conditions.[83][84] Advanced medical imaging with computed tomography (CT) or magnetic resonance imaging (MRI), and with single photon emission computed tomography (SPECT) or positron emission tomography (PET) can be used to help exclude other cerebral pathology or subtypes of dementia.[85] Moreover, it may predict conversion from prodromal stages (mild cognitive impairment) to Alzheimer's disease.[86]

Assessment of intellectual functioning including memory testing can further characterise the state of the disease.[5] Medical organisations have created diagnostic criteria to ease and standardise the diagnostic process for practicing physicians. The diagnosis can be confirmed with very high accuracy post-mortem when brain material is available and can be examined histologically.[87]

Criteria

The National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) and the Alzheimer's Disease and Related Disorders Association (ADRDA, now known as the Alzheimer's Association) established the most commonly used NINCDS-ADRDA Alzheimer's Criteria for diagnosis in 1984,[87] extensively updated in 2007.[88] These criteria require that the presence of cognitive impairment, and a suspected dementia syndrome, be confirmed by neuropsychological testing for a clinical diagnosis of possible or probable AD. A histopathologic confirmation including a microscopic examination of brain tissue is required for a definitive diagnosis. Good statistical reliability and validity have been shown between the diagnostic criteria and definitive histopathological confirmation.[89] Eight cognitive domains are most commonly impaired in AD ~memory, language, perceptual skills, attention, constructive abilities, orientation, problem solving and functional abilities. These domains are equivalent to the NINCDS-ADRDA Alzheimer's Criteria as listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) published by the American Psychiatric Association.[90][91]

Techniques

Neuropsychological tests such as the mini-mental state examination (MMSE) are widely used to evaluate the cognitive impairments needed for diagnosis. More comprehensive test arrays are necessary for high reliability of results, particularly in the earliest stages of the disease.[92][93]Neurological examination in early AD will usually provide normal results, except for obvious cognitive impairment, which may not differ from that resulting from other diseases processes, including other causes of dementia.

Further neurological examinations are crucial in the differential diagnosis of AD and other diseases.[5] Interviews with family members are also utilised in the assessment of the disease. Caregivers can supply important information on the daily living abilities, as well as on the decrease, over time, of the

person's mental function.[86] A caregiver's viewpoint is particularly important, since a person with AD is commonly unaware of his own deficits.[94] Many times, families also have difficulties in the detection of initial dementia symptoms and may not communicate accurate information to a physician.[95]

Another recent objective marker of the disease is the analysis of cerebrospinal fluid for beta-amyloid or tau proteins,[96] both total tau protein and phosphorylated tau181P protein concentrations.[97] Searching for these proteins using a spinal tap can predict the onset of Alzheimer's with a sensitivity of between 94% and 100%.[97] When used in conjunction with existing neuroimaging techniques, doctors can identify people with significant memory loss who are already developing the disease.[97] Spinal fluid tests are commercially available, unlike the latest neuroimaging technology.[98] Alzheimer's was diagnosed in one-third of the people who did not have any symptoms in a 2010 study, meaning that disease progression occurs well before symptoms occur.[99]

Supplemental testing provides extra information on some features of the disease or is used to rule out other diagnoses. Blood tests can identify other causes for dementia than AD[5] ~ causes which may, in rare cases, be reversible.[100] It is common to perform thyroid function tests, assess B12, rule out syphilis, rule out metabolic problems (including tests for kidney function, electrolyte levels and for diabetes), assess levels of heavy metals (e.g. lead, mercury) and anaemia. (See differential diagnosis for Dementia). (It is also necessary to rule out delirium).

Psychological tests for depression are employed, since depression can either be concurrent with AD (see Depression of Alzheimer disease), an early sign of cognitive impairment,[101] or even the cause.[102][103]

Imaging

When available as a diagnostic tool, single photon emission computed tomography (SPECT) and positron emission tomography (PET) neuroimaging are used to confirm a diagnosis of Alzheimer's in conjunction with evaluations involving mental status examination.[104] In a person already having dementia, SPECT appears to be superior in differentiating Alzheimer's disease from other possible causes, compared with the usual attempts employing mental testing and medical history analysis.[105] Advances have led to the proposal of new diagnostic criteria.[5][88]

A new technique known as PiB PET has been developed for directly and clearly imaging beta-amyloid deposits in vivo using a tracer that binds selectively to the A-beta deposits.[106] The PiB-PET compound uses carbon-11 PET scanning. Recent studies suggest that PiB-PET is 86% accurate in predicting which people with mild cognitive impairment will develop Alzheimer's disease within two years, and 92% accurate in ruling out the likelihood of developing Alzheimer's.[107]

PiB PET remains investigational, however a similar PET scanning radiopharmaceutical called florbetapir, containing the longer-lasting radionuclide fluorine-18, has recently been tested as a diagnostic tool in Alzheimer's disease, and given FDA approval for this use.[108][109][110][111] Florbetapir, like PiB, binds to beta-amyloid, but due to its use of fluorine-18 has a half-life of 110 minutes, in contrast to PiB's radioactive half life of 20 minutes. Wong et al. found that the longer life allowed the tracer to accumulate significantly more in the brains of people with AD, particularly in the regions known to be associated with beta-amyloid deposits.[111]

One review predicted that amyloid imaging is likely to be used in conjunction with other markers rather than as an alternative.[112]

Volumetric MRI can detect changes in the size of brain regions. Measuring those regions that atrophy during the progress of Alzheimer's disease is showing promise as a diagnostic indicator. It may prove less expensive than other imaging methods currently under study.[113]

Non-Imaging biomarkers

Recent studies have shown that people with AD had decreased glutamate (Glu) as

well as decreased Glu/creatine (Cr), Glu/myo-inositol (mI), Glu/N-acetylaspartate (NAA), and NAA/Cr ratios compared to normal people. Both decreased NAA/Cr and decreased hippocampal glutamate may be an early indicator of AD.[114]

Early research in mouse models may have identified markers for AD. The applicability of these markers is unknown.[115]

A small human study in 2011 found that monitoring blood dehydroepiandrosterone (DHEA) variations in response to an oxidative stress could be a useful proxy test: the subjects with MCI did not have a DHEA variation, while the healthy controls did.[116]

Prevention

At present, there is no definitive evidence to support that any particular measure is effective in preventing AD.[117] Global studies of measures to prevent or delay the onset of AD have often produced inconsistent results. However, epidemiological studies have proposed relationships between certain modifiable factors, such as diet, cardiovascular risk, pharmaceutical products, or intellectual activities among others, and a population's likelihood of developing AD. Only further research, including clinical trials, will reveal whether these factors can help to prevent AD.[118]

Although cardiovascular risk factors, such as hypercholesterolaemia, hypertension, diabetes, and smoking, are associated with a higher risk of onset and course of AD,[119][120] statins, which are cholesterol lowering drugs, have not been effective in preventing or improving the course of the disease.[121][122] The components of a Mediterranean diet, which include fruit and vegetables, bread, wheat and other cereals, olive oil, fish, and red wine, may all individually or together reduce the risk and course of Alzheimer's disease.[123] The diet's beneficial cardiovascular effect has been proposed as the mechanism of action.[123] There is limited evidence that light to moderate use of alcohol, particularly red wine, is associated with lower risk of AD.[124]

Reviews on the use of vitamins have not found enough evidence of efficacy to recommend vitamin C,[125] E,[125][126] or folic acid with or without vitamin B12,[127] as preventive or treatment agents in AD. Additionally vitamin E is associated with important health risks.[125] Trials examining folic acid (B9) and other B vitamins failed to show any significant association with cognitive decline.[128] Docosahexaenoic acid, an Omega 3 fatty acid, has not been found to slow decline.[129]

Long-term usage of non-steroidal anti-inflammatory drug (NSAIDs) is associated with a reduced likelihood of developing AD.[130] Human postmortem studies, in animal models, or in vitro investigations also support the notion that NSAIDs can reduce inflammation related to amyloid plaques.[130] However trials investigating their use as palliative treatment have failed to show positive results while no prevention trial has been completed.[130] Curcumin from the curry spice turmeric has shown some effectiveness in preventing brain damage in mouse models due to its anti-inflammatory properties.[131][132] Hormone replacement therapy, although previously used, is no longer thought to prevent dementia and in some cases may even be related to it.[133][134] There is inconsistent and unconvincing evidence that ginkgo has any positive effect on cognitive impairment and dementia,[135] and a recent study concludes that it has no effect in reducing the rate of AD incidence.[136] A 21-year study found that coffee drinkers of 3-5 cups per day at midlife had a 65% reduction in risk of dementia in late-life.[137]

People who engage in intellectual activities such as reading, playing board games, completing crossword puzzles, playing musical instruments, or regular social interaction show a reduced risk for Alzheimer's disease.[138] This is compatible with the cognitive reserve theory, which states that some life experiences result in more efficient neural functioning providing the individual a cognitive reserve that delays the onset of dementia manifestations.[138] Education delays the onset of AD syndrome, but is not related to earlier death after diagnosis.[139] Learning a second language even

later in life seems to delay getting Alzheimer disease.[140]Physical activity is also associated with a reduced risk of AD.[139]

Two studies have shown that medical cannabis may be effective in inhibiting the progress of AD. The active ingredient in marijuana, THC, may prevent the formation of deposits in the brain associated with Alzheimer's disease. THC was found to inhibit acetylcholinesterase more effectively than commercially marketed drugs.[141][142][143] One review of the clinical research found no evidence that cannabinoids are effective in the improvement of disturbed behavior or in the treatment of other symptoms of AD or dementia, and concluded that more randomized double-blind placebo controlled trials would be needed to determine whether cannabinoids are clinically effective in treating the disease.[144] A 2012 review from the Philosophical Transactions of a Royal Society B suggested that activating the cannabinoid system may trigger an "anti-oxidant cleanse" in the brain by removing damaged cells and improving the efficiency of the mitochondria. The review found cannabinoids may slow decline in cognitive functioning.[145][146]

Some studies have shown an increased risk of developing AD with environmental factors such the intake of metals, particularly aluminium,[147][148] or exposure to solvents.[149] The quality of some of these studies has been criticised,[150] and other studies have concluded that there is no relationship between these environmental factors and the development of AD.[151][152][153][154]

While some studies suggest that extremely low frequency electromagnetic fields may increase the risk for Alzheimer's disease,[citation needed] reviewers found that further epidemiological and laboratory investigations of this hypothesis are needed.[155] Smoking is a significant AD risk factor.[156]Systemic markers of the innate immune system are risk factors for late-onset AD.[157]

Management

There is no cure for Alzheimer's disease; available treatments offer relatively small symptomatic benefit but remain palliative in nature. Current treatments can be divided into pharmaceutical, psychosocial and caregiving.

Pharmaceutical

Five medications are currently used to treat the cognitive manifestations of AD: four are acetylcholinesterase inhibitors (tacrine, rivastigmine, galantamine and donepezil) and the other (memantine) is an NMDA receptor antagonist.[158] No drug has an indication for delaying or halting the progression of the disease.

Reduction in the activity of the cholinergic neurons is a well-known feature of Alzheimer's disease.[159]Acetylcholinesterase inhibitors are employed to reduce the rate at which acetylcholine (ACh) is broken down, thereby increasing the concentration of ACh in the brain and combating the loss of ACh caused by the death of cholinergic neurons.[160] Cholinesterase inhibitors approved for the management of AD symptoms are donepezil (brand name Aricept),[161]galantamine (Razadyne),[162] and rivastigmine (branded as Exelon[163]). There is evidence for the efficacy of these medications in mild to moderate Alzheimer's disease,[164][165] and some evidence for their use in the advanced stage. Only donepezil is approved for treatment of advanced AD dementia.[166] The use of these drugs in mild cognitive impairment has not shown any effect in a delay of the onset of AD.[167] The most common side effects are nausea and vomiting, both of which are linked to cholinergic excess. These side effects arise in approximately 10â ^20% of users and are mild to moderate in severity. Less common secondary effects include muscle cramps, decreased heart rate (bradycardia), decreased appetite and weight, and increased gastric acid production.[168]

Glutamate is a useful excitatory neurotransmitter of the nervous system, although excessive amounts in the brain can lead to cell death through a process called excitotoxicity which consists of the overstimulation of glutamate receptors. Excitotoxicity occurs not only in Alzheimer's disease, but also in other neurological diseases such as Parkinson's disease and multiple sclerosis.[169]Memantine (brand names Akatinol)[170] is a noncompetitive NMDA

receptor antagonist first used as an anti-influenza agent. It acts on the glutamatergic system by blocking NMDA receptors and inhibiting their overstimulation by glutamate.[169] Memantine has been shown to be moderately efficacious in the treatment of moderate to severe Alzheimer's disease. Its effects in the initial stages of AD are unknown.[171] Reported adverse events with memantine are infrequent and mild, including hallucinations, confusion, dizziness, headache and fatigue.[172] The combination of memantine and donepezil has been shown to be "of statistically significant but clinically marginal effectiveness".[173]

Antipsychotic drugs are modestly useful in reducing aggression and psychosis in Alzheimer's disease with behavioural problems, but are associated with serious adverse effects, such as cerebrovascular events, movement difficulties or cognitive decline, that do not permit their routine use.[174][175] When used in the long-term, they have been shown to associate with increased mortality.[175]

Hyperzine A while promising, requires further evidence before it use can be recommended.[176]

Psychosocial intervention

Psychosocial interventions are used as an adjunct to pharmaceutical treatment and can be classified within behaviour-, emotion-, cognition- or stimulation-oriented approaches. Research on efficacy is unavailable and rarely specific to AD, focusing instead on dementia in general.[177]

Behavioural interventions attempt to identify and reduce the antecedents and consequences of problem behaviours. This approach has not shown success in improving overall functioning,[178] but can help to reduce some specific problem behaviours, such as incontinence.[179] There is a lack of high quality data on the effectiveness of these techniques in other behaviour problems such as wandering.[180][181]

Emotion-oriented interventions include reminiscence therapy, validation therapy, supportive psychotherapy, sensory integration, also called snoezelen, and simulated presence therapy. Supportive psychotherapy has received little or no formal scientific study, but some clinicians find it useful in helping mildly impaired people adjust to their illness.[177] Reminiscence therapy (RT) involves the discussion of past experiences individually or in group, many times with the aid of photographs, household items, music and sound recordings, or other familiar items from the past. Although there are few quality studies on the effectiveness of RT, it may be beneficial for cognition and mood.[182] Simulated presence therapy (SPT) is based on attachment theories and involves playing a recording with voices of the closest relatives of the person with Alzheimer's disease. There is partial evidence indicating that SPT may reduce challenging behaviours.[183] Finally, validation therapy is based on acceptance of the reality and personal truth of another's experience, while sensory integration is based on exercises aimed to stimulate senses. There is little evidence to support the usefulness of these therapies.[184][185]

The aim of cognition-oriented treatments, which include reality orientation and cognitive retraining, is the reduction of cognitive deficits. Reality orientation consists in the presentation of information about time, place or person in order to ease the understanding of the person about its surroundings and his or her place in them. On the other hand cognitive retraining tries to improve impaired capacities by exercitation of mental abilities. Both have shown some efficacy improving cognitive capacities,[186][187] although in some studies these effects were transient and negative effects, such as frustration, have also been reported.[177]

Stimulation-oriented treatments include art, music and pet therapies, exercise, and any other kind of recreational activities. Stimulation has modest support for improving behaviour, mood, and, to a lesser extent, function. Nevertheless, as important as these effects are, the main support for the use of stimulation therapies is the change in the person's routine.[177]

Caregiving

Since Alzheimer's has no cure and it gradually renders people incapable of

tending for their own needs, caregiving essentially is the treatment and must be carefully managed over the course of the disease.

During the early and moderate stages, modifications to the living environment and lifestyle can increase patient safety and reduce caretaker burden.[188][189] Examples of such modifications are the adherence to simplified routines, the placing of safety locks, the labelling of household items to cue the person with the disease or the use of modified daily life objects.[177][190][191] The patient may also become incapable of feeding themselves, so they require food in smaller pieces or pureed.[192] When swallowing difficulties arise, the use of feeding tubes may be required. In such cases, the medical efficacy and ethics of continuing feeding is an important consideration of the caregivers and family members.[193][194] The use of physical restraints is rarely indicated in any stage of the disease, although there are situations when they are necessary to prevent harm to the person with AD or their caregivers.[177]

As the disease progresses, different medical issues can appear, such as oral and dental disease, pressure ulcers, malnutrition, hygiene problems, or respiratory, skin, or eye infections. Careful management can prevent them, while professional treatment is needed when they do arise.[195][196] During the final stages of the disease, treatment is centred on relieving discomfort until death.[197]

A small recent study in the US concluded that people whose caregivers had a realistic understanding of the prognosis and clinical complications of late dementia were less likely to receive aggressive treatment near the end of life.[198]

Feeding tubes

There is strong evidence that feeding tubes do not help people with advanced Alzheimer's dementia gain weight, regain strength or function, prevent aspiration pneumonias, or improve quality of life.[199][200][201][202]

Prognosis

Disability-adjusted life year for Alzheimer and other dementias per 100,000 inhabitants in 2004.

Â Â no data
Â Â â ¢Â 50
Â Â 50â ^70
Â Â 70â ^90
Â Â 90â ^110
Â Â 110â ^130
Â Â 130â ^150
Â Â 150â ^170
Â Â 170â ^190
Â Â 190â ^210
Â Â 210â ^230
Â Â 230â ^250
Â Â â ¥Â 250

The early stages of Alzheimer's disease are difficult to diagnose. A definitive diagnosis is usually made once cognitive impairment compromises daily living activities, although the person may still be living independently. The symptoms will progress from mild cognitive problems, such as memory loss through increasing stages of cognitive and non-cognitive disturbances, eliminating any possibility of independent living, especially in the late stages of the disease.[25]

Life expectancy of the population with the disease is reduced.[9][203][204] The mean life expectancy following diagnosis is approximately seven years.[9] Fewer than 3% of people live more than fourteen years.[10] Disease features significantly associated with reduced survival are an increased severity of cognitive impairment, decreased functional level, history of falls, and disturbances in the neurological examination. Other coincident diseases such as heart problems, diabetes or history of alcohol abuse are also related with shortened survival.[203][205][206] While the earlier the age at onset the higher the total survival years, life expectancy is particularly reduced when compared to the healthy population among those who are younger.[204] Men have a less favourable survival prognosis than women.[10][207]

The disease is the underlying cause of death in 70% of all cases.[9] Pneumonia and dehydration are the most frequent immediate causes of death, while cancer is a less frequent cause of death than in the general population.[9][207]

Epidemiology

Incidence rates

after age 65[208]

Age

New affected

per thousand

personâ ^years

65â ^69

Â 3

70â ^74

Â 6

75â ^79

Â 9

80â ^84

23

85â ^89

40

90â ^Â Â Â Â

69

Two main measures are used in epidemiological studies: incidence and prevalence. Incidence is the number of new cases per unit of personâ ^time at risk (usually number of new cases per thousand personâ ^years); while prevalence is the total number of cases of the disease in the population at any given time.

Regarding incidence, cohort longitudinal studies (studies where a disease-free population is followed over the years) provide rates between 10 and 15 per thousand personâ ^years for all dementias and 5â ^8 for AD,[208][209] which means that half of new dementia cases each year are AD. Advancing age is a primary risk factor for the disease and incidence rates are not equal for all ages: every five years after the age of 65, the risk of acquiring the disease approximately doubles, increasing from 3 to as much as 69 per thousand person years.[208][209] There are also sex differences in the incidence rates, women having a higher risk of developing AD particularly in the population older than 85.[209][210]

Prevalence of AD in populations is dependent upon different factors including incidence and survival. Since the incidence of AD increases with age, it is particularly important to include the mean age of the population of interest. In the United States, Alzheimer prevalence was estimated to be 1.6% in 2000 both overall and in the 65â ^74 age group, with the rate increasing to 19% in the 75â ^84 group and to 42% in the greater than 84 group.[211] Prevalence rates in less developed regions are lower.[212] The World Health Organization estimated that in 2005, 0.379% of people worldwide had dementia, and that the prevalence would increase to 0.441% in 2015 and to 0.556% in 2030.[213] Other studies have reached similar conclusions.[212] Another study estimated that in 2006, 0.40% of the world population (range 0.17â ^0.89%; absolute number 26.6 million, range 11.4â ^59.4 million) were afflicted by AD, and that the prevalence rate would

triple and the absolute number would quadruple by 2050.[3]

History

The ancient Greek and Roman philosophers and physicians associated old age with increasing dementia.[1] It was not until 1901 that German psychiatrist Alois Alzheimer identified the first case of what became known as Alzheimer's disease in a fifty-year-old woman he called Auguste D. He followed her case until she died in 1906, when he first reported publicly on it.[214] During the next five years, eleven similar cases were reported in the medical literature, some of them already using the term Alzheimer's disease.[1] The disease was first described as a distinctive disease by Emil Kraepelin after suppressing some of the clinical (delusions and hallucinations) and pathological features (arteriosclerotic changes) contained in the original report of Auguste D.[215] He included Alzheimer's disease, also named presenile dementia by Kraepelin, as a subtype of senile dementia in the eighth edition of his Textbook of Psychiatry, published on July 15, 1910.[216]

For most of the 20th century, the diagnosis of Alzheimer's disease was reserved for individuals between the ages of 45 and 65 who developed symptoms of dementia. The terminology changed after 1977 when a conference on AD concluded that the clinical and pathological manifestations of presenile and senile dementia were almost identical, although the authors also added that this did not rule out the possibility that they had different causes.[217] This eventually led to the diagnosis of Alzheimer's disease independently of age.[218] The term senile dementia of the Alzheimer type (SDAT) was used for a time to describe the condition in those over 65, with classical Alzheimer's disease being used for those younger. Eventually, the term Alzheimer's disease was formally adopted in medical nomenclature to describe individuals of all ages with a characteristic common symptom pattern, disease course, and neuropathology.[219]

Society and culture

Social costs

Dementia, and specifically Alzheimer's disease, may be among the most costly diseases for society in Europe and the United States,[18][19] while their cost in other countries such as Argentina,[220] or South Korea,[221] is also high and rising. These costs will probably increase with the ageing of society, becoming an important social problem. AD-associated costs include direct medical costs such as nursing home care, direct nonmedical costs such as in-home day care, and indirect costs such as lost productivity of both patient and caregiver.[19] Numbers vary between studies but dementia costs worldwide have been calculated around \$160Â billion,[222] while costs of Alzheimer's disease in the United States may be \$100Â billion each year.[19]

The greatest origin of costs for society is the long-term care by health care professionals and particularly institutionalisation, which corresponds to 2/3 of the total costs for society.[18]The cost of living at home is also very high,[18] especially when informal costs for the family, such as caregiving time and caregiver's lost earnings, are taken into account.[223]

Costs increase with dementia severity and the presence of behavioural disturbances,[224] and are related to the increased caregiving time required for the provision of physical care.[223] Therefore any treatment that slows cognitive decline, delays institutionalisation or reduces caregivers' hours will have economic benefits. Economic evaluations of current treatments have shown positive results.[19]

Caregiving burden

The role of the main caregiver is often taken by the spouse or a close relative.[14] Alzheimer's disease is known for placing a great burden on caregivers which includes social, psychological, physical or economic aspects.[15][16][17] Home care is usually preferred by people with AD and their families.[225] This option also delays or eliminates the need for more professional and costly levels of care.[225][226] Nevertheless two-thirds of nursing home residents have dementias.[177]

Dementia caregivers are subject to high rates of physical and mental

disorders.[227] Factors associated with greater psychosocial problems of the primary caregivers include having an affected person at home, the carer being a spouse, demanding behaviours of the cared person such as depression, behavioural disturbances, hallucinations, sleep problems or walking disruptions and social isolation.[228][229] Regarding economic problems, family caregivers often give up time from work to spend 47 hours per week on average with the person with AD, while the costs of caring for them are high. Direct and indirect costs of caring for an Alzheimer's patient average between \$18,000 and \$77,500 per year in the United States, depending on the study.[14][223]

Cognitive behavioural therapy and the teaching of coping strategies either individually or in group have demonstrated their efficacy in improving caregivers' psychological health.[15][230]

Notable cases

As Alzheimer's disease is highly prevalent, many notable people have developed it. Well-known examples are former United States President Ronald Reagan and Irish writer Iris Murdoch, both of whom were the subjects of scientific articles examining how their cognitive capacities deteriorated with the disease.[231][232][233] Other cases include the retired footballer Ferenc Puskas,[234] the former Prime Ministers Harold Wilson (United Kingdom) and Adolfo Suárez (Spain),[235][236] the actress Rita Hayworth,[237] the actor Charlton Heston,[238] the novelist Terry Pratchett,[239] Indian politician George Fernandes,[240] and the 2009 Nobel Prize in Physics recipient Charles K. Kao.[241]

AD has also been portrayed in films such as: *Iris* (2001), based on John Bayley's memoir of his wife Iris Murdoch;[242] *The Notebook* (2004), based on Nicholas Sparks' 1996 novel of the same name;[243] *A Moment to Remember* (2004); *Thanmathra* (2005);[244] *Memories of Tomorrow* (*Ashita no Kioku*) (2006), based on Hiroshi Ogiwara's novel of the same name;[245] *Away from Her* (2006), based on Alice Munro's short story "The Bear Came over the Mountain".[246] Documentaries on Alzheimer's disease include *Malcolm and Barbara: A Love Story* (1999) and *Malcolm and Barbara: Love's Farewell* (2007), both featuring Malcolm Pointon.[247]

Research directions

As of 2012[update], the safety and efficacy of more than 400 pharmaceutical treatments had been or were being investigated in 1012 clinical trials worldwide, and approximately a quarter of these compounds are in Phase III trials, the last step prior to review by regulatory agencies.[12]

One area of clinical research is focused on treating the underlying disease pathology. Reduction of beta-amyloid levels is a common target of compounds[248] (such as apomorphine) under investigation. Immunotherapy or vaccination for the amyloid protein is one treatment modality under study.[249] Unlike preventative vaccination, the putative therapy would be used to treat people already diagnosed. It is based upon the concept of training the immune system to recognise, attack, and reverse deposition of amyloid, thereby altering the course of the disease.[250] An example of such a vaccine under investigation was ACC-001,[251][252] although the trials were suspended in 2008.[253] Another similar agent is bapineuzumab, an antibody designed as identical to the naturally induced anti-amyloid antibody.[254] Other approaches are neuroprotective agents, such as AL-108,[255] and metal-protein interaction attenuation agents, such as PBT2.[256] A TNF receptor fusion protein, etanercept has showed encouraging results.[257]

In 2008, two separate clinical trials showed positive results in modifying the course of disease in mild to moderate AD with methylthioninium chloride (trade name rember), a drug that inhibits tau aggregation,[258][259] and dimebon, an antihistamine.[260] The consecutive phase-III trial of dimebon failed to show positive effects in the primary and secondary endpoints.[261][262][263]

The common herpes simplex virus HSV-1 has been found to colocate with amyloid plaques.[264] This suggested the possibility that AD could be treated or prevented with antiviral medication.[264][265]

Preliminary research on the effects of meditation on retrieving memory and

cognitive functions have been encouraging. Limitations of this research can be addressed in future studies with more detailed analyses.[266]

An FDA panel voted unanimously to recommend approval of florbetapir, which is currently used in an investigational study. The imaging agent can help to detect Alzheimer's brain plaques, but will require additional clinical research before it can be made available commercially.[267]

On December 31, 2012, a NASA-supported study reported that manned spaceflight may harm the brain of astronauts and accelerate the onset of Alzheimer's disease.[268][269][270]

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External links

Hasekura Rokuemon Tsunenaga (or "Francisco Felipe Faxicura", as he was baptized in Spain) (1571â ^1622) (Japanese: æ~ã å -ã ³è¡,é~ å,,é~·, also spelled Faxicura Rocuyemon in period European sources, reflecting the contemporary pronunciation of Japanese)[1] was a Japanese samurai and retainer of Date Masamune, the daimyo of Sendai.

In the years 1613 through 1620, Hasekura headed a diplomatic mission to the Vatican in Rome, traveling through New Spain (arriving in Acapulco and departing from Veracruz) and visiting various ports-of-call in Europe. This historic mission is called the KeichÅ Embassy (æ ¶é~·ä½¿ç~), and follows the

Tenshō embassy (天正使節) of 1582.[2] On the return trip, Hasekura and his companions re-traced their route across Mexico in 1619, sailing from Acapulco for Manila, and then sailing north to Japan in 1620.[3] He is conventionally considered the first Japanese ambassador in the Americas and in Europe.[4]

Although Hasekura's embassy was cordially received in Europe, it happened at a time when Japan was moving toward the suppression of Christianity. European monarchs such as the King of Spain thus refused the trade agreements Hasekura had been seeking. Hasekura returned to Japan in 1620 and died of illness a year later, his embassy seemingly ending with few results in an increasingly isolationist Japan.

Japan's next embassy to Europe would only occur more than 200 years later, following two centuries of isolation, with the "First Japanese Embassy to Europe" in 1862.

[edit] Early life

Little is known of the early life of Hasekura Tsunenaga. He was a mid-level noble samurai in the Sendai Domain in northern Japan, who had the opportunity to directly serve the daimyo Date Masamune. They were of roughly the same age, and it is recorded that several important missions were given to Tsunenaga as his representative.

It is also recorded that Hasekura served as samurai of the Japanese invasion of Korea under the Taiko Toyotomi Hideyoshi, during six months in 1597.

In 1612, Hasekura's father, Hasekura Tsunenari (長宗), was indicted for corruption, and he was put to death in 1613. His fief was confiscated, and his son should normally have been executed as well. Date however gave him the opportunity to redeem his honour by placing him in charge of the Embassy to Europe, and soon gave him back his territories as well.

[edit] Background: early contacts between Japan and Spain

The Spanish started trans-Pacific voyages between New Spain (Mexico) and the Philippines in 1565. The famous Manila galleons carried silver from Mexican mines westward to the entrepôt of Manila in the Spanish possession of the Philippines. There, the silver was used to purchase spices and trade goods gathered from throughout Asia, including (until 1638) goods from Japan. The return route of the Manila galleons, first charted by the Spanish navigator Andrés de Urdaneta, took the ships northeast into the Kuroshio Current (also known as the Japan Current) off the coast of Japan, and then across the Pacific to the west coast of North America, landing eventually in Acapulco.[5]

Spanish ships were periodically shipwrecked on the coasts of Japan due to bad weather, initiating contacts with the country. The Spanish wished to expand the Christian faith in Japan. Efforts to expand influence in Japan were met by stiff resistance towards the Jesuits, who had started the evangelizing of the country in 1549, as well as by the opposition of Portuguese and the Dutch who did not wish to see Spain participate in Japanese trade. However, some Japanese, such as Christopher and Cosmas, are known to have crossed the Pacific onboard Spanish galleons as early as 1587. It is known that gifts were exchanged between the governor of the Philippines and Toyotomi Hideyoshi, who thanks him in a 1597 letter, writing "The black elephant in particular I found most unusual." [6]

In 1609, the Spanish Manila galleon San Francisco encountered bad weather on its way from Manila to Acapulco, and was wrecked on the Japanese coast in Chiba, near Tokyo. The sailors were rescued and welcomed, and the ship's captain, Rodrigo de Vivero, former interim governor of the Philippines, met with the retired shogun Tokugawa Ieyasu. Rodrigo de Vivero drafted a treaty, signed on 29 November 1609, whereby the Spaniards could establish a factory in eastern Japan, mining specialists would be imported from New Spain, Spanish ships would be allowed to visit Japan in case of necessity, and a Japanese embassy would be sent to the Spanish court.

[edit] First Japanese expeditions to the Americas

[edit] 1610 San Buena Ventura

A Franciscan monk named Luis Sotelo, who was proselytizing in the area of what is now modern Tokyo, convinced Tokugawa Ieyasu and his son Tokugawa Hidetada to

send him as a representative to New Spain (Mexico) on one of their ships, in order to advance the trade treaty. Rodrigo de Vivero offered to sail on the Japanese ship in order to guarantee the safety of their reception in New Spain, but insisted that another Franciscan, named Alonso Mu  os, be sent instead as the Shogun's representative. In 1610, the returning Rodrigo de Vivero, several Spanish sailors, the Franciscan father, and 22 Japanese representatives led by the trader Tanaka Sh  suke, sailed to Mexico aboard the San Buena Ventura, a ship built by the English adventurer William Adams for the Shogun. Once in New Spain, Alonso Mu  os met with the Viceroy Luis de Velasco, who agreed to send an ambassador to Japan in the person of the famous explorer Sebastian Vizcaino, with the added mission of exploring the "Gold and silver islands" ("Isla de Plata") that were thought to be east of the Japanese isles.

Vizcaino arrived in Japan in 1611, and had many meetings with the Shogun and feudal lords. These encounters were tainted by his poor respect for Japanese customs, the mounting resistance of the Japanese towards Catholic proselytism, and the intrigues of the Dutch against Spanish ambitions. Vizcaino finally left to search for the "Silver island", during which search he encountered bad weather, forcing him to return to Japan with heavy damage.

[edit] 1612 San Sebastian

Without waiting for Vizcaino, another ship ^ built in Izu by the Bakufu under the minister of the Navy Mukai Shogen, and named San Sebastian ^ left for Mexico on 9 September 1612 with Luis Sotelo onboard as well as two representatives of Date Masamune, with the objective of advancing the trade agreement with New Spain. However, the ship foundered a few miles from Uruga, and the expedition had to be abandoned.

[edit] The 1613 embassy project

The Shogun decided to build a new galleon in Japan in order to bring Vizcaino back to Nueva España, together with a Japanese embassy accompanied by Luis Sotelo. The galleon, named Date Maru by the Japanese and later San Juan Bautista by the Spanish, took 45 days work in building, with the participation of technical experts from the Bakufu (the Minister of the Navy Mukai Shogen, an acquaintance of William Adams with whom he built several ships, dispatched his Chief Carpenter), 800 shipwrights, 700 smiths, and 3,000 carpenters. The daimyo of Sendai, Date Masamune, was put in charge of the project. He named one of his retainers, Hasekura Tsunenaga (his fief was rated at around 600 koku), to lead the mission:

"The Great Ship left Toshima-Tsukinoura for the Southern Barbarians on 15 September [Japanese calendar], with at its head Hasekura Rokuemon Tsunenaga, and those called Imaizumi Sakan, Matsuki Shusaku, Nishi Kyusuke, Tanaka Taroemon, Naito Hanjuro, Sonohoka Kyuemon, Kuranojo, Tonomo, Kitsunai, Kyuji, as well as several others under Rokuemon, as well as 40 Southern Barbarians, 10 men of Mukai Shogen, and also tradespeople, to a total 180" (Records of the Date House, Keicho 5 - Genna 2 ¼ é ~â@¶æ ¶é~.â á' ç- æ §, Gonoï p. 56).

The objective of the Japanese embassy was both to discuss trade agreements with the Spanish crown in Madrid, and to meet with the Pope in Rome. Date Masamune displayed a great will to welcome the Catholic religion in his domain: he invited Luis Sotelo and authorized the propagation of Christianity in 1611. In his letter to the Pope, brought by Hasekura, he wrote: "I'll offer my land for a base of your missionary work. Send us as many padres as possible."

Sotelo, in his own account of the travels, emphasizes the religious dimension of the mission, claiming that the main objective was to spread the Christian faith in northern Japan:

"I was formerly dispatched as ambassador of Idate Masamune, who holds the reins of the kingdom of Oxu [Japanese:あづま.] (which is in the Eastern part of Japan) ~who, while he has not yet been reborn through baptism, has been catechized, and was desirous that the Christian faith should be preached in his kingdom~ together with another noble of his Court, Philippus Franciscus Faxecura Rocuyemon, to the Roman Senate & to the one who at that time was in charge of the Apostolic See, His Holiness Pope Paul V." (Luis Sotelo De Ecclesiae Iaponicae Statu Relatio, 1634).[7]

The embassy was probably, at that time, part of a plan to diversify and increase trade with foreign countries, before the participation of Christians in the Osaka rebellion triggered a radical reaction from the Shogunate, with the interdiction of Christianity in the territories it directly controlled, in 1614.

[edit] Trans-Pacific voyage

Upon completion, the ship left on 28 October 1613 for Acapulco with around 180 people on board, including 10 samurai of the Shogun (provided by the Minister of the Navy Mukai Shogen Tadakatsu), 12 samurai from Sendai, 120 Japanese merchants, sailors, and servants, and around 40 Spaniards and Portuguese, including Sebastian Vizcaino who, in his own words, only had the quality of a passenger.[8]

[edit] New Spain (Acapulco)

The ship first reached Cape Mendocino in today's California, and then continued along the coast to arrive in Acapulco on 25 January 1614 after three months at sea. The Japanese were received with great ceremony, but had to wait in Acapulco until orders were received regarding how to organize the rest of their travels.

Fights erupted between the Japanese and the Spaniards, especially Vizcaino, apparently due to some disputes on the handling of presents from the Japanese ruler. A contemporary journal, written by the historian Chimalpahin Quauhtlehuanitzin, a noble Aztec born in Amecameca (ancient Chalco province) in 1579, whose formal name was Domingo Francisco de San Anton Mu  n, relates Vizcaino was seriously wounded in the fight:

"Se  or Vizcaino is still coming slowly, coming hurt; the Japanese injured him when they beat and stabbed him in Acapulco, as became known here in Mexico, because of all the things coming along that had been made his responsibility in Japan"[10]

Following these fights, orders were promulgated on 4 and 5 March to bring peace back. The orders explained that:

"The Japanese should not be submitted to attacks in this Land, but they should remit their weapons until their departure, except for Hasekura Tsunenaga and eight of his retinue... The Japanese will be free to go where they want, and should be treated properly. They should not be abused in words or actions. They will be free to sell their goods. These orders have been promulgated to the Spanish, the Indians, the Mulattos, the Mestizos, and the Blacks, and those who don't respect them will be punished".[11]

[edit] New Spain (Mexico)

The embassy remained two months in Acapulco and entered Mexico City on 24 March,[10] where it was received with great ceremony. The ultimate mission for the embassy was to go on to Europe. The embassy spent some time in Mexico, and then went to Veracruz to board the fleet of Don Antonio Oquendo.

Chimalpahin gives some account of the visit of Hasekura.

"This is the second time that the Japanese have landed one of their ships on the shore at Acapulco. They are transporting here all things of iron, and writing desks, and some cloth that they are to sell here." (Chimalpahin, "Annals of His Time").[12]

"It became known here in Mexico and was said that the reason their ruler the Emperor of Japan sent this said lordly emissary and ambassador here, is to go in Rome to see the Holy Father Paul V, and to give him their obedience concerning the holy church, so that all the Japanese want to become Christians" (Chimalpahin, "Annals of His Time").[13]

Hasekura was settled in a house next to the Church of San Francisco, and met with the Viceroy. He explained to him that he was also planning to meet King Philip III to offer him peace and to obtain that the Japanese could come to Mexico for trade. On Wednesday 9 April, 20 Japanese were baptized, and 22 more on 20 April by the archbishop in Mexico, don Juan P  rez de la Serna, at the Church of San Francisco.[14] Altogether 63 of them received confirmation on 25 April. Hasekura waited for his travel to Europe to be baptized there:

"But the lordly emissary, the ambassador, did not want to be baptized here; it was said that he will be baptized later in Spain" (Chimalpahin, "Annals of His Time").[15]

[edit] Departure for Europe

Chimalpahin explains that Hasekura left some of his compatriots behind before leaving for Europe:

"The Ambassador of Japan set out and left for Spain. In going he divided his vassals; he took a certain number of Japanese, and he left an equal number here as merchants to trade and sell things." (Chimalpahin, "Annals of His Time").[16]

The fleet left for Europe on the San Jose on 10 June. Hasekura had to leave the largest parts of the Japanese group behind, who were to wait in Acapulco for the return of the embassy.

Some of them, as well as those from the previous travel of Tanaka ShÅ suke, returned to Japan the same year, sailing back with the San Juan Bautista:

"Today, Tuesday the 14th of the month of October of the year 1614, was when some Japanese set out from Mexico here going home to Japan.; they lived here in Mexico for four years. Some still remained here; they earn a living trading and selling here the goods they brought with them from Japan." (Chimalpahin, "Annals of His Time").[17]

The embassy stopped and changed ships in Havana in Cuba in July 1614. The embassy stayed in Havana for six days. A bronze statue was erected on 26 April 2001 at the head of Havana Bay.[18]

[edit] Mission to Europe

The fleet arrived in Sanlucar de Barrameda on 5 October 1614.

"The fleet arrived safely finally, after some dangers and storms, to the port of SanlÅ°car de Barrameda on 5 October, where the Duke of Medina Sidonia was advised of the arrival. He sent carriages to honor them and accommodate the Ambassador and his gentlemen" (Scipione Amati "History of the Kingdom of Voxu").[19]

"The Japanese ambassador Hasekura Rokuemon, sent by Joate Masamune, king of Boju, entered Seville on Wednesday, 23 October 1614. He was accompanied by 30 Japanese with blades, their captain of the guard, and 12 bowmen and halberdiers with painted lances and blades of ceremony. The captain of the guard was Christian and was called Don Thomas, the son of a Japanese martyr" (Library Capitular Calombina 84-7-19 Memorias..., fol.195).[20]

The Japanese embassy met with King Philip III in Madrid on 30 January 1615. Hasekura remitted to the King a letter from Date Masamune, as well as offer for a treaty. The King responded that he would do what he could to accommodate these requests.

Hasekura was baptized on 17 February by the king's personal chaplain, and renamed Felipe Francisco Hasekura. The baptism ceremony was to have been conducted by the Archbishop of Toledo, Bernardo de Sandoval y Rojas, though he was too ill to actually carry this out, and the Duke of Lerma â ^ the main administrator of Phillip III's rule and the de facto ruler of Spain â ^ was designated as Hasekura's godfather.

The embassy stayed eight months in Spain before leaving the country for Italy.

[edit] France

After traveling across Spain, the embassy sailed on the Mediterranean aboard three Spanish frigates towards Italy. Due to bad weather, they had to stay for a few days in the French harbour of Saint-Tropez, where they were received by the local nobility, and made quite a sensation on the populace.

The visit of the Japanese Embassy is recorded in the city's chronicles as led by "Philip Francis Faxicura, Ambassador to the Pope, from Date Masamunni, King of Woxu in Japan".

Many picturesque details of their movements were recorded:

"They never touch food with their fingers, but instead use two small sticks that they hold with three fingers."

"They blow their noses in soft silky papers the size of a hand, which they

never use twice, so that they throw them on the ground after usage, and they were delighted to see our people around them precipitate themselves to pick them up."

"Their swords cut so well that they can cut a soft paper just by putting it on the edge and by blowing on it."

("Relations of Mme de St Tropez", October 1615, Biblioth  que Inguimbertaine, Carpentras).[21]

The visit of Hasekura Tsunenaga to Saint-Tropez in 1615 is the first recorded instance of Franco-Japanese relations.

The Japanese Embassy went on to Italy where they were able to meet with Pope Paul V in Rome in November 1615, the same year Galileo Galilei was first confronted by the Roman Inquisition regarding his findings against geocentrism. Hasekura remitted to the Pope two gilded letters, one in Japanese and one in Latin, containing a request for a trade treaty between Japan and Mexico and the dispatch of Christian missionaries to Japan. These letters are still visible in the Vatican archives. The Latin letter, probably written by Luis Sotelo for Date Masamune, reads, in part:

Kissing the Holy feet of the Great, Universal, Most Holy Lord of The Entire World, Pope Paul, in profound submission and reverence, I, Idate Masamune, King of W  sh   in the Empire of Japan, suppliantly say:

The Franciscan Padre Luis Sotelo came to our country to spread the faith of God. On that occasion, I learnt about this faith and desired to become a Christian, but I still haven't accomplished this desire due to some small issues. However, in order to encourage my subjects to become Christians, I wish that you send missionaries of the Franciscan church. I guarantee that you will be able to build a church and that your missionaries will be protected. I also wish that you select and send a bishop as well. Because of that, I have sent one of my samurai, Hasekura Rokumon, as my representative to accompany Luis Sotelo across the seas to Rome, to give you a stamp of obedience and to kiss your feet. Further, as our country and Nueva Espa  a are neighbouring countries, could you intervene so that we can discuss with the King of Spain, for the benefit of dispatching missionaries across the seas." Translation of the Latin letter of Date Masamune to the Pope.[22]

The Pope agreed to the dispatch of missionaries, but left the decision for trade to the King of Spain.

The Roman Senate also gave to Hasekura the honorary title of Roman Citizen, in a document he brought back to Japan, and which is preserved today in Sendai.

Sotelo also described the visit to the Pope, book *De ecclesiae Iaponicae statu relatio* (published posthumously in 1634):

"When we got there by the aid of God in the Year of Our Salvation 1615, not only were we kindly received by His Holiness the great Pope, with the Holy College of the Cardinals and a gathering of bishops and nobles, and even the joy and general happiness of the Roman People, but we and three others (whom the Japanese Christians had specially designated to announce their condition with respect to the Christian religion) were heard, rested, and just as we were hoping, dispatched as quickly as possible." (Sotelo, *De ecclesiae Iaponicae statu relatio*).[23]

[edit] Rumours of political intrigue

Besides the official description of Hasekura's visit to Rome, some contemporary communications tend to indicate that political matters were also discussed, and that an alliance with Date Masamune was suggested as a way to establish Christian influence in the whole of Japan:

"The Ambassador strongly insisted that the authority and power of his ruler was superior to that of many European countries" (Anonymous Roman communication, dated 10 October 1615)

"The Franciscan Spanish fathers are explaining that the King of the Ambassador [Hasekura Tsunenaga] will soon become the supreme ruler of his country, and that, not only will they become Christians and follow the will of the church of Rome, but they will also in turn convert the rest of the population. This is

why they are requesting the dispatch of a high ecclesiastic together with the missionaries. Because of this, many people have been doubting the true purpose of the embassy, and are wondering if they are not looking for some other benefit." (Letter of the Venetian ambassador, 7 November 1615).

[edit] Second visit to Spain

For the second time in Spain, Hasekura met again with the King, who declined to sign a trade agreement, on the ground that the Japanese Embassy did not appear to be an official embassy from the ruler of Japan Tokugawa Ieyasu, who, on the contrary, had promulgated an edict in January 1614 ordering the expulsion of all missionaries from Japan, and started the persecution of the Christian faith in Japan.

The embassy left Seville for Mexico in June 1617 after a period of two years spent in Europe, but some of the Japanese remained in Spain in a town near Seville (Coria del R  o), where their descendants to this day still use the surname Jap  n.

[edit] Western publications on Hasekura's embassy

The embassy of Hasekura Tsunenaga was the subject of numerous publications throughout Europe. The Italian writer Scipione Amati, who accompanied the embassy in 1615 and 1616, published in 1615 in Rome a book titled "History of the Kingdom of Voxu". This book was also translated in German in 1617. In 1616, the French publisher Abraham Savgrain published an account of Hasekura's visit to Rome: "R  cit de l'entr  e solennelle et remarquable faite    Rome, par Dom Philippe Francois Faxicura" ("Account of the solemn and remarkable entrance in Rome of Dom Philippe Francois Faxicura").

Amati's book "History of the Kingdom of Woxu", published in 1615.

German translation of Amati's account.

Print depicting Hasekura, with legend in Latin.

[edit] Return to Mexico

Hasekura stayed for 5 months in Mexico on his way back to Japan. The San Juan Bautista was waiting in Acapulco since 1616, after a second trip across the Pacific from Japan to Mexico. Captained by Yokozawa Shogen, she was laden with fine pepper and lacquerware from Kyoto, which were sold on the Mexican market. Following a request by the Spanish king, in order to avoid too much silver leaving to Japan, the Viceroy asked for the proceeds to be spent on Mexican goods, except for an amount of 12,000 pesos and 8,000 pesos in silver which Hasekura and Yokozawa could bring back with them respectively.

[edit] Philippines

In April 1618, the San Juan Bautista arrived in the Philippines from Mexico, with Hasekura and Luis Sotelo on board. The ship was acquired by the Spanish government there, with the objective of building up defenses against the attacks of the Dutch and the English. The bishop of the Philippines with the local Filipinos and native Tagalog in Manila described the deal to the king of Spain in a missive dated 28 July 1619:

"The Governor was extremely friendly with the Japanese, and provided them with his protection. As they had many expensive things to buy, they decided to lend their ship. The ship was immediately furnished for combat. The Governor eventually bought the ship, because it turned out that it was of excellent and sturdy construction, and available ships were dramatically few. In favour of your Majesty, the price paid was reasonable." (Document 243)

During his stay in the Philippines with local Filipinos and Native Tagalog, Hasekura purchased numerous goods for Date Masamune, and built a ship, as he explained in a letter he wrote to his son. He finally returned to Japan in August 1620, reaching the harbour of Nagasaki.

[edit] Return to Japan

By the time Hasekura came back, Japan had changed quite drastically: an effort to eradicate Christianity had been under way since 1614, Tokugawa Ieyasu had died in 1616 and been replaced by his more xenophobic son Tokugawa Hidetada, and Japan was moving towards the "Sakoku" policy of isolation. Because news of these persecutions arrived in Europe during Hasekura's embassy, European rulers

â ^ especially the King of Spain â ^ became very reluctant to respond favorably to Hasekura's trade and missionary proposals.

Hasekura reported his travels to Date Masamune upon his arrival in Sendai. It is recorded that he remitted a portrait of Pope Paul V, a portrait of himself in prayer (shown above), and a set of Ceylonese and Indonesian daggers acquired in the Philippines, all preserved today in the Sendai City Museum. The "Records of the House of Masamune" describe his report in a rather succinct manner, ending with a rather cryptic expression of surprise bordering on the outrage ("あゝ æ ¢æ å'ã .") at Hasekura's discourse:

"Rokuemon went to the country of the Southern Barbarians, he paid his respects to the king Paolo, he stayed there for several years, and now he sailed back from Luzon. He brought paintings of the king of the Southern Barbarians, and a painting of himself, which he remitted. Many of his descriptions of the Southern Barbarian countries, and the meaning of Rokuemon's declarations were surprising and extraordinary." [24]

[edit] Interdiction of Christianity in Sendai

The direct effect of Hasekura's return to Sendai was the interdiction of Christianity in the Sendai fief two days later:

"Two days after the return of Rokuemon to Sendai, a three-point edict against the Christian was promulgated: first, that all Christians were ordered to abandon their faith, in accordance with the rule of the Shogun, and for those who did not, they would be exiled if they were nobles, and killed if they were citizens, peasants or servants. Second, that a reward would be given for the denunciation of hidden Christians. Third that propagators of the Christian faith should leave the Sendai fief, or else, abandon their religion" (November 1620 letter of father Angelis, Japan-China archives of the Jesuits in Rome, quoted in Gonoï's "Hasekura Tsunenaga", p231)

What Hasekura said or did to bring about such a result is unknown. As later events tend to indicate that he and his descendants remained faithful Christians, Hasekura may have made an enthusiastic â ^ and to a certain extent, disturbing â ^ account of the greatness and might of Western countries and the Christian religion. He may also have encouraged an alliance between the Church and Date Masamune to take over the country (an idea advertized by the Franciscans while in Rome), which, in 1620 Japan, would have been a totally unrealistic proposition. Lastly, hopes of trade with Spain evaporated when Hasekura communicated that the Spanish King would not enter an agreement as long as persecutions were occurring in the rest of the country.

Date Masamune, heretofore very tolerant of Christianity in spite of the Bakufu's prohibition in the land it directly controlled, thus suddenly chose to distance himself from the Western faith. The first executions of Christians started 40 days later. The anti-Christian measures taken by Date Masamune were however comparatively mild, and Japanese and Western Christians repeatedly claimed that he only took them to appease the Shogun:

"Date Masamune, out of fear of the Shogun, ordered the persecution of Christianity in his territory, and created several martyrs." (Letter of 17 prominent Japanese Christians from Sendai, to the Pope, 29 September 1621). [25]

One month after Hasekura's return, Date Masamune wrote a letter to the Shogun Tokugawa Hidetada, in which he makes a very clear effort to evade responsibility for the embassy, explaining in detail how it was organized with the approval, and even the collaboration, of the Shogun:

"When I sent a ship to the Southern Barbarian countries several years ago, upon the advice of Mukai Shogen, I also dispatched the Southern Barbarian named Sotelo, who had resided for several years in Edo. At that time, your highness also gave messages for the Southern Barbarians, as well as presents, such as folding screens and sets of armour." (18 October 1620, quoted in Gonoï, p. 234).

Spain was by far the most threatening power for Japan at that time (with a colony and an army in the nearby Philippines). Hasekura's eyewitness accounts of Spanish power and colonial methods in Nueva España (Mexico) may have precipitated the Shogun Tokugawa Hidetada's decision to sever trade relations with Spain in 1623, and diplomatic relations in 1624, although other events

such as the smuggling of Spanish priests into Japan and a failed Spanish embassy also contributed to the decision.

What became of Hasekura is unknown and accounts of his last years are numerous. Contemporary Christian commentators could only rely on hearsay, with some rumours stating that he abandoned Christianity, others that he was martyred for his faith, and others that he practiced Christianity in secret. The fate of his descendants and servants, who were later executed for being Christians, would suggest that Hasekura remained strongly Christian himself, and transmitted his faith to the members of his family.

Sotelo, who returned to Japan but was caught and finally burnt at the stake in 1624, gave before his execution an account of Hasekura returning to Japan as a hero who propagated the Christian faith:

"My other colleague, the ambassador Philipppus Faxecura, after he reached his aforementioned king (Date Masamune), was greatly honored by him, and sent to his own estate, to rest after such a long and tiring journey, where he made his wife, children, servants, and many other vassals into Christians, and advised other nobles who were his kith and kin to accept the faith, which they indeed did. While he was engaged in these and other pious works, a full year after his return, having provided much instruction and a great example, with much preparation, he piously passed on, leaving for his children by a special inheritance the propagation of the faith in his estate, and the protection of the religious (i.e. "members of religious orders") in that kingdom. The King and all the nobles were greatly saddened by his passing, but especially the Christians and Religious, who knew very well the virtue and religious zeal of this man. This is what I heard by letters from the very Religious who administered the sacraments to him, and who had been present at his death, as well as from others." (Luis Sotelo, *De ecclesiae Iaponicae statu relatio*).[26]

Hasekura also did bring back to Japan several Catholic artifacts, but he did not give them to his ruler, and instead kept them in his own estate.

Hasekura Tsunenaga died of illness (according to Japanese as well as Christian sources) in 1622, but the location of his grave is not known for certain. Three graves are claimed as Hasekura's. The most likely is in the outskirts of Osato town (奥州・大田) in Miyagi. Another is visible in the Buddhist temple of Enfukuji (恩福寺) in Miyagi. Another is clearly marked (along with a memorial to Padre Sotelo) in the cemetery of a Buddhist temple in the Kitayama neighborhood at Komyoji Temple (小向寺).

[edit] Execution of his descendants and servants

Hasekura had a son, named Rokuemon Tsuneyori. Two of his son's servants, Yogoemon (五郷・五郎) and his wife, were convicted of being Christian but refused to recant their faith under torture (reverse hanging, called "Tsurushi", 逆吊) and as a result died in August 1637 (as the lives of Christians were spared if they recanted, these executions indicate that they were steadfast and refused to deny their faith). In 1637, Rokuemon Tsuneyori himself also came under suspicion of Christianity after being denounced by someone from Edo, but escaped questioning because he was the master of the Zen temple of Komyoji (小向寺). In 1640, two other servants of Tsuneyori, Tarozaemon (大蔵・次郎), who had followed Hasekura to Rome, and his wife (59), were convicted of being Christians, and, also refusing to recant their faith under torture, died. Tsuneyori was held responsible this time and decapitated the same day, at the age of 42, for having failed to denounce Christians under his roof, although it remained unconfirmed whether he was himself Christian or not.[27] Also, two Christian priests, the Dominican Pedro Vazquez and Joan Bautista Paulo, had given his name under torture. Tsuneyori's younger brother, Tsunemichi, was convicted as a Christian, but managed to flee and disappear.[27]

The privileges of the Hasekura family were abolished at this point by the Sendai fief, and their property and belongings seized. It is at this time, in 1640, that Hasekura's Christian artifacts were confiscated, and they were kept in custody in Sendai until they were rediscovered at the end of the 19th century.

Altogether, around fifty Christian artifacts were found in Hasekura's estate in 1640, such as crosses, rosaries, religious gowns and religious paintings. The artifacts were seized and stored by the Date fief. An inventory was made again in 1840 describing the items as belonging to Hasekura Tsunenaga. Nineteen books were also mentioned in the inventory, but they have been lost since. The artifacts are today preserved in the Sendai City Museum and other museum in Sendai.

[edit] Re-discovery

The very existence of the travels of Hasekura was forgotten in Japan until the reopening of the country after the Sakoku policy of isolation. In 1873, a Japanese embassy to Europe (the Iwakura mission) headed by Iwakura Tomomi heard for the first time of the travels of Hasekura when shown documents during their visit to Venice in Italy.[28]

[edit] Hasekura today

Today, there are statues of Hasekura Tsunenaga in the outskirts of Acapulco in Mexico, at the entrance of Havana Bay in Cuba,[29] in Coria del R  o in Spain,[30] in the Church of Civitavecchia in Italy, in Tsukinoura, near Ishinomaki.[31]   and two in Osato town in Miyagi. [32]

Approximately 700 inhabitants of Coria del R  o bear the surname Jap   n (originally Hasekura de Jap   n), identifying them as descendants of the members of Hasekura Tsunenaga's delegation.[33]

A theme park describing the embassy and displaying a replica of the San Juan Bautista was established in the harbour of Ishinomaki, from which Hasekura initially departed on his voyage.

Today there stands a statue of Hasekura in a park in Manila, the Philippines.

Shusaku Endo wrote a 1980 novel, titled *The Samurai*, a fictitious account relating the travels of Hasekura.

A 2005 animation film produced in Spain and titled *Gisaku* relates the adventures of a young Japanese samurai named Yohei who visited Spain in the 17th century, in a story loosely taking its inspiration from the travels of Hasekura. Yohei survived in hiding to the present day due to magical powers ("After centuries of lethargy, he awakes in a World he does not know"), and accomplishes many adventures in modern Europe as a superhero.[34]

[edit] Timeline and itinerary

[edit] See also

^ In the Japanese of the era, the sound now transcribed as *h* was pronounced as an *f* before all vowels, not just *u*. Likewise *s* was sometimes pronounced *sh* before */e/*, not only before */i/*, and the syllable *  * (now read as *e*), was pronounced *ye*. On the other hand, the use of *x* to represent the *sh* sound is specific to the older pronunciations of Spanish and Portuguese.

^ In the name "*Keich   Embassy*", the noun "*Keich  * " refers to the *neng  * (Japanese era name) after "*Bunroku*" and before "*Genna*." In other words, the *Keich   Embassy* commenced during *Keich  * , which was a time period spanning the years from 1596 through 1615.

^ Ministry of Foreign Affairs: Japan-Mexico Relations.

^ The *Keich   Embassy* was, in fact, preceded by a Sengoku period mission headed by Mancio Ito with Alessandro Valignano in 1582   ^1590. Although less well-known and less well-documented, this historic mission is sometimes referred to as the "*Tensh   Embassy*" because it was initiated in the *Tensh  * era. This venture was organized by three daimyo of Western Japan    ^ Omura Sumitada, Otomo Sorin and Arima Harunobu.

^ Hayes, Derek (2001). *Historical atlas of the North Pacific Ocean: maps of discovery and scientific exploration, 1500   ^2000*. Seattle, Washington: Sasquatch Books. pp.   17   ^19.

^ <http://www.kufs.ac.jp/toshokan/50/zos.htm>

^ Nemp   fuisse me quondam Idate Masamune, qui regni Oxu (quod est in Orientali Iaponi  | parte) gubernacula tenet, nec dum quidem per baptismum regenerato, sed tamen Catechumeno, & qui Christianam fidem in suo regno pr  dicari cupiebat, simul cum alio su  | Curi  | optimate Philippo Francisco Faxecura Retuyemon [sic]

ad Romanam Curiam & qui tunc Apostolicæ sedis culmen tenebat SS. Papam Paulum V. qui ad cælos evolavit, Legatum expeditum. (p. 1)

^ Sebastian Vizcaino "Account of the search for the gold and silver islands", quoted by Gonoï

^ Cardona "Geographic Descriptions", by Michael Mathes, ISBN 0-87093-235-7 p75

^ a b "Annals of his time", p275

^ "5th document", quoted from "Hasekura Tsunanaga", Gonoï, p77

^ Chimalpahin "Annals of his time", 4 March 1614, p275

^ Chimalpahin "Annals of his time", 24 March 1614, p275

^ "Image of the church". Concise.britannica.com.

<http://concise.britannica.com/ebc/art-17637>. Retrieved 2011-11-06.

^ Chimalpahin "Annals of his time", 9 April 1614, p277

^ Chimalpahin "Annals of his time", 29 May 1614, p283

^ Chimalpahin "Annals of his time", 14 October 1614, p291

^ <http://granmai.cubaweb.com/ingles/abril4/17japone-i.html>

^ "Se llegó por fin a salvo, después de algunos peligros y tempestades al puerto de Sanlúcar de Barrameda el 5 de Octubre, donde residiendo el Duque de Medina Sidonia y avisado del arribo, envió carrozas para honrarlos, recibirlos y acomodar en ellas al Embajador y a sus gentiles hombres, habiéndoles preparado un suntuoso alojamiento; y después de haber cumplido con esta obligación como correspondía, y de regalarlos con toda liberalidad, a instancias de la ciudad de Sevilla hizo armar dos galeras, las cuales llevaron a los embajadores a CORIA, donde fueron hospedados por orden de la dicha Ciudad por Don Pedro Galindo, veinticuatro, el cual se ocupó con gran diligencia en tener satisfecho el ánimo del Embajador con todos los placeres y regalos posibles, procurando este entretanto que preparasen ropas nuevas a su séquito y ayudantes para resplandecer con más decoro y pompa a la entrada en Sevilla. Mientras se resolvía esta cuestión, la Ciudad determinó enviar a Coria a Don Diego de Cabrera, hermano del padre Sotelo, a Don Bartolomé López de Mesa, del hábito de Calatraba, a Don Bernardo de Ribera, a Don Pedro Galindo y a multitud de jurados y otros caballeros para que en su nombre besaran la mano al Embajador y lo felicitaron por su llegada a salvo. Sobre esto, quedó el Embajador contentísimo, agradeció mucho a la Ciudad que por su generosidad se complacía en honrarle, y se apartó con los dichos caballeros mostrando mucha prudencia en su trato". "A veintiuno de Octubre del dicho año la Ciudad hizo otra demostración de la mayor cortesía para el recibimiento del Embajador y del Padre Sotelo mandando carrozas, cabalgaduras y gran número de caballeros y de nobles que lo escoltaron formando una cabalgata de gran solemnidad. Saliendo el Embajador de Coria, vio con sumo placer el honor que se le había preparado, la pompa de los caballeros y la gran cantidad de gente que lo acompañó durante su camino hacia Sevilla". "Cerca de Triana y antes de cruzar el puente, se multiplicó de tal manera el número de carrozas, caballos y gentes de todo género, que no bastaba la diligencia de dos alguaciles y de otros ministros de la justicia para poder atravesarlo. Finalmente compareció el Conde de Salvatierra. Asistente de la Ciudad, con gran número de titulados y con los restantes veinticuatro y caballeros; y el embajador desmontando de la carroza, montó a caballo con el Capitán de su guardia y Caballerizo, vestido sobriamente, a la usanza del Japón, y mostrando al Asistente lo obligado que quedaba de la mucha cortesía y honores que la Ciudad se servía de usar con él, fue puesto en medio del dicho Asistente y Alguaciles Mayores y prosiguiéndose la cabalgata con increíble aplauso y contento de la gente, por la Puerta de Triana se dirigieron al Alcázar Real." (Scipione Amati, "Historia del regno di Voxu", 1615)

^ "Mientras que el 23 de octubre de 1614 llegó a Sevilla el embajador Japon Faxera Recuremon, enviado de Joate Masamune, rey de Boju. Traía treinta hombres japoneses con cuchillas, con su capitán de la guardia, y doce flecheros y alabarderos con lanzas pintadas y sus cuchillas de abara. El capitán era cristiano y se llamaba don Thomas, y era hijo de un mártir Japonés. Venía a dar la obediencia a Su Santidad por su rey y reyno, que se había bautizado. Todos traían rosarios al cuello; y él venía a recibir el bautismo de mano de Su

[^] Collega alter legatus Philippus Fiaxecura [sic] postquam ad prædictum Regem

suum pervenit, ab ipso valdē est honoratus, & in proprium statum missus, ut tam longā viā fessus reficeretur, ubi uxorem, filios, domesticos cum multis aliis vasallis Christianos effecit, aliisque nobilibus hominibus consanguineis & propinquis suasit ut fidem reciperent; quam utique receperunt. Dum in his & aliis piis operibus exerceretur ante annum completum post eius regressum magna cum omnium edificatio & exemplo, multa cum preparatione suis filiis hereditate praecipua fidei propagationem in suo statu, & Religiosorum in eo regno protectionem commendatam relinquens, pie defunctus est. De cuius discessu Rex & omnes Nobiles valdē doluerunt, praecipuē tamen Christiani & Religiosi, qui huius viri virtutem & fidei Zelum optimē noverant. Ab ipsis Religiosis, qui eidem sacramenta ministrarunt, eiusque obitui interfuerant; & ab aliis sic per literas accepi. (p. 16)

^ a b "National Treasure: Documents of the Keicho Embassy to Europe", p80

^ Source: Sendai museum monograph. Description of the visit of the Hasekura mission to the Venice archives Text (Japanese)

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[edit] External links

Persondata

Name

Hasekura Tsunenaga

Alternative names

Rocuyemon, Faxecura (contemporary pronunciation); Don Felipe Francisco Hasekura (Christian name); Philippus Franciscus Faxecura Rocuyemon (Latin)

Short description
Japanese Samurai and diplomat
Date of birth
1571
Place of birth
Japan
Date of death
1622
Place of death
Japan

Babakotia is an extinct genus of medium-sized lemur, or strepsirrhine primate, from Madagascar that contains a single species, *Babakotia radofilai*. Together with *Palaeopropithecus*, *Archaeoindris*, and *Mesopropithecus*, it forms the family *Palaeopropithecidae*, commonly known as the sloth lemurs. The name *Babakotia* comes from the Malagasy name for the Indri, *babakoto*, to which it and all other sloth lemurs are closely related. Due to its mix of morphological traits that show intermediate stages between the slow-moving smaller sloth lemurs and the suspensory large sloth lemurs, it has helped determine the relationship between both groups and the closely related and extinct monkey lemurs.

Babakotia radofilai and all other sloth lemurs share many traits with living sloths, demonstrating convergent evolution. It had long forearms, curved digits, and highly mobile hip and ankle joints. Its skull was more heavily built than that of indriids, but not as much as in the larger sloth lemurs. Its dentition is similar to that of all other indriids and sloth lemurs. It lived in the northern part of Madagascar and shared its range with at least two other sloth lemur species, *Palaeopropithecus ingens* and *Mesopropithecus dolichobrachion*. *Babakotia radofilai* was primarily a leaf-eater (folivore), though it also ate fruit and hard seeds. It is known only from subfossil remains and may have died out shortly after the arrival of humans on the island, but not enough radiocarbon dating has been done with this species to know for certain.

[edit] Etymology

The name of the genus *Babakotia* derives from the Malagasy common name for the Indri, *babakoto*, a close relative of *Babakotia*. The species name, *radofilai*, was chosen in honor of French mathematician and expatriate Jean Radofilao, an avid spelunker who mapped the caves where remains of *Babakotia radofilai* were first found.[5]

[edit] Classification and phylogeny

Babakotia radofilai is the sole member of the genus *Babakotia* and belongs to the family *Palaeopropithecidae*, which includes three other genera of sloth lemurs: *Palaeopropithecus*, *Archaeoindris*, and *Mesopropithecus*. This family in turn belongs to the infraorder *Lemuriformes*, which includes all the Malagasy lemurs.[1][3]

The first subfossil remains of *Babakotia radofilai* were discovered as part of a series of expeditions launched in the early 1980s by biological anthropologist Elwyn Simons.[6] They were unearthed in 1988 at a cave known as Antsiroandoha in the Ankarana Massif, northern Madagascar. A nearly complete skeleton and skull were found, in addition to the remains of roughly a dozen other individuals.[4] Identified immediately as a sloth lemur (*palaeopropithecid*) upon its discovery,[5] *Babakotia* along with *Mesopropithecus* helped to settle a debate about the relationship between the sloth lemurs, the monkey lemurs (family *Archaeolemuridae*) and the living indriids. The monkey lemurs had skulls that more closely resembled the indriids, but their teeth were very specialized and unlike those of the indriids. The larger sloth lemurs, on the other hand, retained a dentition similar to living indriids, yet differed by having more robust and specialized skulls. *Babakotia* and *Mesopropithecus* not only shared the indriid dentition, but also the indriid-like skulls, providing evidence that sloth lemurs were most closely related to living indriids, with monkey lemurs as a sister group to both.[7]

Furthermore, the discovery of *Babakotia* helped to demonstrate that the ancestral indriids were not "ricochetal leapers" (bouncing rapidly from tree to tree) like living indriids, but vertical climbers and hanging feeders, and possibly occasional leapers.[8]

[edit] Anatomy and physiology

Weighing between 16 and 20 kg (35 and 44 lb), *Babakotia radofilai* was a medium-sized lemur and noticeably smaller than the large sloth lemurs (*Archaeoindris* and *Palaeopropithecus*), but larger than the small sloth lemurs (*Mesopropithecus*).[1][3] In many ways, it had an intermediate level of adaptations for suspensory behavior between the large sloth lemurs and the small sloth lemurs.[3][4][9][7][10] This includes its highly mobile hip and ankle joints, as well as other specializations in the vertebral column, pelvis, and limbs.[10] Its forelimbs were 20% longer than its hind limbs, giving it a higher intermembral index (~119) than *Mesopropithecus* (~97 to 113), suggesting that it was convergently similar to arboreal sloths.[10][11] It had a reduced tarsus and curved, elongated digits, adapted for grasping and suggesting suspensory behavior.[10][12] Its hind feet were reduced, making it well-adapted for climbing and hanging (like in other palaeopropithecids), but not leaping (like in indriids).[1][3][4] Wrist bones found in 1999 further demonstrated that this species was a vertical climber.[13] Additionally, analysis of its semicircular canals,[14] lumbar vertebrae and its spinous processes indicate slow movement and climbing (antipronograde) adaptations, but not necessarily sloth-like hanging, vertical clinging, or leaping.[15] Therefore, it was likely a slow climber like a loris and also exhibited some suspensory behavior like a sloth.[6]

All sloth lemurs have relatively robust skulls compared to the indriids,[3] yet despite shared cranial features with the larger sloth lemurs,[7] its skull still resembles that of an *Indri*. [1] The cranial traits shared with the other sloth lemurs include relatively small orbits, robust zygomatic arches, and a mostly rectangular hard palate.[3] The small orbits taken into consideration with the relative size of the optic canal suggests that *Babakotia* had low visual acuity, which is typical for lemurs.[18] The skull length averages 144 mm (5.7 in).[4]

The dental formula of *Babakotia radofilai* was the same as the other sloth lemurs and indriids: either [3][7] or .[4] It is unclear whether one of the teeth in the permanent dentition is an incisor or canine, resulting in these two conflicting dental formulae.[19] Regardless, the lack of either a lower canine or incisor results in a four-tooth toothcomb instead of the more typical six-tooth strepsirrhine toothcomb. *Babakotia radofilai* differed slightly from indriids in having somewhat elongated premolars. Its cheek teeth had broad shearing crests and crenulated enamel.[4]

[edit] Distribution and ecology

Like all other lemurs, *Babakotia radofilai* was endemic to Madagascar. Its remains have only been found in limestone caves at the Ankarana Massif and Anjohibe, indicating a range across the extreme north and northwest of the island.[3][4][20] The restricted range of this arboreal primate, particularly during a time when much of the island was blanketed in forest, might have been due to habitat specificity, competitive exclusion, or some other unknown factor.[21] It was sympatric (occurred together) with *Palaeopropithecus maximus* and *Mesopropithecus dolichobrachion*. [6]

Based on its size, the morphology of its molars, and microwear analysis on its teeth, *Babakotia radofilai* was likely a folivore, while supplementing its diet with fruit and hard seeds.[1][9][18][22] In all sloth lemurs, including *Babakotia radofilai*, the permanent teeth erupted early, a trait seen in indriids that improves survivability of juveniles during the first dry season following weaning.[10]

[edit] Extinction

Because it died out relatively recently and is only known from subfossil remains, it is considered to be a modern form of Malagasy lemur.[20] *Babakotia radofilai* lived during the Holocene epoch and is thought to have disappeared

shortly after the arrival of humans to the island, possibly within the last 1000 years.[3] However, the only radiocarbon date that has been reported for it dates back to about 3100±2800 BCE.[23]

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The Cock Lane ghost was a purported haunting that attracted mass public attention in 1762. The location was an apartment in Cock Lane, a short road adjacent to London's Smithfield market and a few minutes' walk from St Paul's Cathedral. The event centred around three people: William Kent, a usurer from Norfolk, Richard Parsons, a parish clerk, and Parsons' daughter Elizabeth.

Following the death during childbirth of Kent's wife, Elizabeth Lynes, he became romantically involved with her sister, Fanny. Canon law prevented the couple from marrying, but they nevertheless moved to London and lodged at the property in Cock Lane, then owned by Parsons. Several accounts of strange knocking sounds and ghostly apparitions were reported, although for the most part they stopped after the couple moved out, but following Fanny's death from smallpox, and Kent's successful legal action against Parsons over an outstanding debt, they began again. Parsons claimed that Fanny's ghost haunted his property, and later his daughter. Regular sâˆ“ances were held to determine "Scratching Fanny's" motives, and Cock Lane was often made impassable by the throngs of interested bystanders.

The ghost appeared to claim that Fanny had been poisoned with arsenic, and Kent was publicly suspected of being her murderer, but a commission whose members included Samuel Johnson concluded that the supposed haunting was a fraud. Further investigations proved the scam was perpetrated by Elizabeth Parsons, under duress from her father. Those responsible were prosecuted and found guilty; Richard Parsons was pilloried and sentenced to two years in prison.

The Cock Lane ghost became a focus of controversy between the Methodist and Anglican churches and is referenced frequently in contemporary literature. Charles Dickens is one of several Victorian authors whose work alluded to the story and the pictorial satirist William Hogarth referenced the ghost in two of his prints.

[edit] Background

In about 1756âˆ“57 William Kent, a usurer from Norfolk,[1] married Elizabeth

Lynes, the daughter of a grocer from Lyneham. They moved to Stoke Ferry where Kent kept an inn, and later the local post office. They were apparently very much in love, but their marriage was short-lived as within a month of the move Elizabeth died during childbirth. Her sister Francesâ ~commonly known as Fannyâ ~had during Elizabeth's pregnancy moved in with the couple, and she remained to take care of the infant and its father. The boy did not survive long and rather than leave, Fanny stayed on to take care of William and the house. The two soon began a relationship, but canon law appeared to rule out marriage; when Kent travelled to London to seek advice he was told that as Elizabeth had borne him a living son, a union with Fanny was impossible. In January 1759 therefore, he gave up the post office, left Fanny and moved to London, intending to "purchase a place in some public office" in the hope that "business would erase that passion he had unfortunately indulged". Fanny meanwhile stayed with one of her brothers at Lyneham.[2]

Despite her family's disapproval of their relationship, Fanny began to write passionate letters to Kent, "filled with repeated entreaties to spend the rest of their lives together". He eventually allowed her to join him at lodgings in East Greenwich near London. The two decided to live together as man and wife, making wills in each other's favour and hoping to remain discreet. In this, however, they did not reckon on Fanny's relations. The couple moved to lodgings near the Mansion House, but their landlord there may have learnt of their relationship from Fanny's family, expressing his contempt by refusing to repay a sum of money Kent loaned him (about £20).[nb 1] In response, Kent had him arrested.[4]

While attending early morning prayers at the church of St Sepulchre-without-Newgate William Kent and Fanny met Richard Parsons, the officiating clerk[4] Although he was generally considered respectable, Parsons was known locally as a drunk and was struggling to provide for his family. He listened to the couple's plight and was sympathetic, offering them the use of lodgings in his home at what (in 1965) was 20Â Cock Lane, to the north of St Sepulchre's. Located along a narrow, winding thoroughfare similar to most of central London's streets, the three-storey house was in a respectable but declining area, and comprised a single room on each floor, connected by a winding staircase.[5] Shortly after Mr and Mrs Kent (as they called themselves) moved in, Kent loaned Parsons 12Â guineas, to be repaid at a rate of a guinea per month.[6]

It was while Kent was away at a wedding in the country that the first reports of strange noises began. Parsons had a wife and two daughters; the elder, Elizabeth, was described as a "little artful girl about eleven years of age".[7] Kent asked Elizabeth to stay with Fanny, who was then several months into a pregnancy, and to share her bed while he was away. The two reported hearing scratching and rapping noises. These were attributed by Mrs Parsons to a neighbouring cobbler, although when the noises re-occurred on a Sunday, Fanny asked if the cobbler was working that day; Mrs Parsons told her he was not. James Franzen, landlord of the nearby Wheat Sheaf public house, was another witness. After visiting the house he reported seeing a ghostly white figure ascend the stairs, and terrified, left to go home. Parsons visited him there that same night, and claimed also to have seen a ghost.[8][9]

As Fanny was only weeks away from giving birth Kent made arrangements to move to a property at Bartlet's Court in Clerkenwell, but by January 1760 it was not ready and so they moved instead to an "inconvenient" apartment nearby, intending only a temporary stay.[10][11] However, on 25Â January Fanny fell ill. The attending doctor diagnosed the early stages of an eruptive fever and agreed with Kent that their lodgings were inadequate for someone at so critical a stage of pregnancy. Fanny was therefore moved, by coach, to Bartlet's Court. The next day her doctor returned and met with her apothecary. Both agreed that Fanny's symptoms were indicative of smallpox. On hearing this, Fanny sent for an attorney, to ensure the will she had had made was in good order, and that Kent would inherit her estate. An acquaintance of Kent's, the Reverend Stephen Aldrich of St John Clerkenwell, reassured her that she would be forgiven for

her sins. She died on 2Â February.[12]

As sole executor of Fanny's will, Kent ordered a coffin, but fearful of being prosecuted should the nature of their relationship become known, asked that it remain nameless. On registering the burial he was, however, forced to give a name, and he gave her his own. Fanny's family was notified and her sister Ann Lynes, who lived nearby at Pall Mall, attended the funeral at St John's. When Ann learned of the terms of Fanny's will, which left her brothers and sisters half a crown each and Kent the rest, she tried but failed to block it in Doctors' Commons. The bulk of Kent's inheritance was Fanny's Â£150 share of her dead brother Thomas's estate. This also included some land owned by Thomas, sold by the executor of his estate, John Lynes, and Kent received Fanny's share of that too (almost Â£95). Her family resented this. Legal problems with Lynes's sale meant that each of Thomas's beneficiaries had to pay Â£45 in compensation to the purchaser, but Kent refused, claiming that he had already spent the money in settling Fanny's debts. In response to this, in October 1761 John Lynes began proceedings against Kent in the Court of Chancery.[nb 2] Meanwhile Kent became a stockbroker, and in 1761 married again.[13]

[edit] Haunting

Echoing the actions of Kent's previous landlord, Parsons had not repaid Kent's loanâ ~of which about three guineas was outstandingâ ~and Kent therefore instructed his attorney to sue him.[10][11] He managed to recover the debt by January 1762, just as the mysterious noises at Cock Lane began again.[7] Catherine Friend had lodged there shortly after the couple left but moved out when she found the noises, which had returned intermittently and which were becoming more frequent, could not be stopped. They apparently emanated from Elizabeth Parsons, who also suffered fits, and the house was regularly disturbed by unexplained noises, likened at the time to the sound of a cat scratching a chair.[7] Reportedly determined to discover their source, Richard Parsons had a carpenter remove the wainscoting around Elizabeth's bed.[14] He approached John Moore, assistant preacher at St Sepulchre's since 1754 and rector of St Bartholomew-the-Great in West Smithfield since June 1761. The presence of one ghost, presumed to belong to Fanny's sister, Elizabeth, had already been noted while Fanny lay dying, and the two concluded that the spirit now haunting Parsons' house must be that of Fanny Lynes herself. The notion that a person's spirit might return from the dead to warn those still alive was a commonly held belief, and the presence of two apparently restless spirits was therefore an obvious sign to both men that each ghost had an important message to disclose.[15]

Parsons and Moore devised a method of communication; one knock for yes, two knocks for no. Using this system, the ghost appeared to claim that Fanny had been murdered. It was conjectured that the mysterious figure in white which so terrified James Franzen, presumed to be the ghost of Elizabeth, had appeared there to warn her sister of her impending death. As the first ghost had seemingly vanished, this charge against Kentâ ~that he murdered Elizabethâ ~was never acted on, but through repeated questioning of Fanny's ghost it was divined that she had died not from the effects of smallpox, but rather from arsenic poisoning. The deadly toxin had apparently been administered by Kent about two hours before Fanny died and now, it was supposed, her spirit wanted justice. Moore had heard from Parsons how Kent had pursued the debt he was owed, and he had also heard from Ann Lynes, who had complained that as Fanny's coffin lid was screwed down she had not been able to see her sister's corpse. Moore thought that Fanny's body might not show any visible signs of smallpox and that if she had been poisoned, the lack of scarring would have been something Kent would rather keep hidden. As a clergyman with inclinations toward Methodism he was inclined to trust the ghost, but for added support he enlisted the aid of Reverend Thomas Broughton, an early Methodist. Broughton visited Cock Lane on 5Â January and left convinced the ghost was real. The story spread through London, The Public Ledger began to publish detailed accounts of the phenomenon, and Kent fell under public suspicion as a murderer.[16][17]

[edit] SÃances

After reading the veiled accusations made against him in the Public Ledger, Kent determined to clear his name, and accompanied by a witness went to see John Moore. The Methodist showed Kent the list of questions he and Parsons had drawn up for the ghost to answer. One concerned William and Fanny's marital status, prompting Kent to admit that they never married. Moore told him he did not think he was a murderer, rather, he believed the spirit's presence indicated that "there was something behind darker than all the rest, and that if he would go to Parson's house, he might be a witness to the same and convinced of its reality". On 12th January therefore, Kent enlisted the aid of the two physicians who attended Fanny in her last days, and with Reverend Broughton, went to Cock Lane. On the house's upper floor Elizabeth Parsons was publicly undressed, and with her younger sister was put to bed. The audience sat around the bed, positioned in the centre of the room. They were warned that the ghost was sensitive to disbelief, and told that they should accord it due respect. When the s^{an}ce began, a relative of Parsons, Mary Frazer,[7] ran around the room shouting "Fanny, Fanny, why don't you come? Do come, pray Fanny, come; dear Fanny, come!" Nothing happened, and Moore told the group the ghost would not come as they were making too much noise. He asked them to leave the room, telling them he would try to contact the ghost by stamping his foot. About ten minutes later they were told the ghost had returned, and that they should re-enter the room.[18] Moore then started to run through his and Parsons' list of questions:

"Are you the wife of Mr. Kent?"[^] [^]Two knocks

"Did you die naturally?"[^] [^]Two knocks

"By poison?"[^] [^]One knock

"Did any person other than Mr. Kent administer it?"[^] [^]Two knocks

After more questions, a member of the audience exclaimed "Kent, ask this Ghost if you shall be hanged". He did so, and the question was answered by a single knock. Kent exclaimed "Thou art a lying spirit, thou are not the ghost of my Fanny. She would never have said any such thing." [18]

Public interest in the story grew when it was discovered that the ghost appeared to follow Elizabeth Parsons. She was removed to the house of a Mr Bray, where on 14th January, in the presence of two unidentified nobles, more knocking sounds were heard.[18] A few days later she was returned to Cock Lane, where on 18th January another s^{an}ce was held. In attendance were Kent, the apothecary, and local parish priest and incumbent of St John Clerkenwell, Reverend Stephen Aldrich.[20] On that occasion, when a clergyman used a candle to look under the bed, the ghost "refused" to answer, Frazer claiming "she [the ghost] loving not light". After a few minutes of silence the questioning continued, but when Moore asked if the ghost would appear in court against Kent, Frazer refused to ask the question.[21]

When they lived at Cock Lane William and Fanny had employed a maid, Esther "Carrots" Carlisle (Carrots on account of her red hair). She had since moved to a new job and knew nothing of the haunting, but seeking evidence of Fanny's poisoning, Moore went to question her. Carrots told him that Fanny had been unable to speak in the days before she died, so Moore invited her to a s^{an}ce, held on 19th January. Once there, she was asked to confirm that Fanny had been poisoned, but Carrots remained adamant that Fanny had said nothing to her, telling the party that William and Fanny had been "very loving, and lived very happy together." Kent arrived later that night, this time with James Franzen and the Reverends William Dodd and Thomas Broughton. Frazer began with her usual introduction before Moore sent her out, apparently irritated by her behaviour. He then asked the party of about 20 to leave the room, calling them back a few minutes later.[22] This time, the s^{an}ce centred on Carrots, who addressed the ghost directly:

"Are you my mistress?"[^] [^]One knock, followed by scratches

"Are you angry with me, Madam?"[^] [^]One knock

"Then I am sure, Madam, you may be ashamed of yourself for I never hurt you in my life."

At this, the séance was ended. Frazer and Franzen remained alone in the room, the latter reportedly too terrified to move. Frazer asked if he would like to pray and was angered when he apparently could not. The séance resumed and Franzen later returned to his home, where he and his wife were reportedly tormented by the ghost's knocking in their bedchamber.[23]

[edit] Investigation

On 20th January another séance was held, this time at the home of a Mr Bruin, on the corner of nearby Hosier Lane. Among those attending was a man "extremely desirous of detecting the fraud, and discovering the truth of this mysterious affair", who later sent his account of the night to the London Chronicle. He arrived with a small party which included Reverend James Penn of St Ann's in Aldersgate. Inside the house, a member of the group positioned himself against the bed, but was asked by one of the ghost's sympathisers to move. He refused, and following a brief argument the ghost's supporters left. The gentleman then asked if Parsons would allow his daughter to be moved to a room at his house, but was refused. For the remainder of the night the ghost made no sound, while Elizabeth Parsons, now extremely agitated, displayed signs of convulsions. When questioned she confirmed that she had seen the ghost, but that she was not frightened by it. At that point several of the party left, but at about 7^{am} the next morning the knocking once more recommenced. Following the usual questions about the cause of Fanny's death and who was responsible, the interrogation turned to her body, which lay in the vaults of St John's.[24]

Parsons agreed to move his daughter to Reverend Aldrich's house for further testing on 22nd January, but when that morning Penn and a man of "veracity and fortune" called on Parsons and asked for Elizabeth, the clerk told them she was not there and refused to reveal her whereabouts. Parsons had spoken with friends and was apparently worried that Kent had been busy with his own investigations.[nb 3] Instead, he allowed Elizabeth to be moved that night to St Bartholomew's Hospital, where another séance was held. Nothing was reported until about 6^{am}, when three scratches were heard, apparently while the girl was asleep. The approximately 20-strong audience complained that the affair was a deception. Once Elizabeth woke she began to cry, and once reassured that she was safe admitted that she was afraid for her father, "who must needs be ruined and undone, if their matter should be supposed to be an imposture." She also admitted that although she had appeared to be asleep, she was in fact fully aware of the conversation going on around her.[26]

Whereas several advertisements have appeared in the papers reflecting upon my character, who am father of the child which now engrosses the talk of the town; I do hereby declare publicly, that I have always been willing and am now ready to deliver up my child for trial into the hands of any number of candid and reasonable men, requiring only such security for a fair and gentle treatment of my child, as no father of children or man of candour would refuse.

â

â "

Richard Parsons, the Public Ledger, 26th January 1762[27]

Initially only the Public Ledger reported on the case, but once it became known that noblemen had taken an interest and visited the ghost at Mr Bray's house on 14th January, the story began to appear in other newspapers. The St. James's Chronicle and the London Chronicle printed reports from 16th ^19 January (the latter the more sceptical of the two), and Lloyd's Evening Post from 18th ^20 January. The story spread across London and by the middle of January the crowds gathered outside the property were such that Cock Lane was rendered impassable. Parsons charged visitors an entrance fee to "talk" with the ghost, which, it was reported, did not disappoint.[17][28][29] After receiving several requests

to intercede, Samuel Fludyer, Lord Mayor of London, was on 23rd January approached by Alderman Gosling, John Moore and Parsons. They told him of their experiences but Fludyer was reminded of the then recent case of fraudster Elizabeth Canning and refused to have Kent or Parsons arrested (on charges of murder and conspiracy respectively). Instead, against a backdrop of hysteria caused in part by the newspapers' relentless reporting of the case, he ordered that Elizabeth be tested at Reverend Aldrich's house. Meanwhile, Elizabeth was again the subject of study, in two s^{es}ances held 23rd - 24th January.[30] Parsons accepted the Lord Mayor's decision, but asked that "some persons connected with the girl might be permitted to be there, to divert her in the day-time". This was refused, as were two similar requests, Aldrich and Penn insisting that they would accept only "any person or persons, of strict character and reputation, who are housekeepers". Aldrich and Penn's account of their negotiations with Parsons clearly perturbed the clerk, as he defended his actions in the Public Ledger. This prompted Aldrich and Penn to issue a pointed retort in Lloyd's Evening Post: "We are greatly puzzled to find Mr. Parsons asserting that he hath been always willing to deliver up the child, when he refused a gentleman on Wednesday evening the 20th inst. [...] What is to be understood, by requiring security"?[27]

Elizabeth was taken on 26th January to the house of Jane Armstrong, sleeping there in a hammock. The continued noises strengthened the resolve of the ghost's supporters, while the press's ceaseless reporting of the case continued. Horace Walpole, 4th Earl of Orford, announced that with the Duke of York, Lady Northumberland, Lady Mary Coke and Lord Hertford, he was to visit Cock Lane on 30th January. After struggling through the throngs of interested visitors though, he was ultimately disappointed; the Public Advertiser observed that "the noise is now generally deferred till seven in the morning, it being necessary to vary the time, that the imposition may be the better carried on".[31]

[edit] Exposure

With Lord Dartmouth Aldrich began to draw together the people who would be involved in his investigation. They chose the matron of a local lying-in hospital as principal lady-in-waiting, the critic and controversialist Bishop John Douglas, and Dr George Macaulay. A Captain Wilkinson was also included on the committee; he had attended one s^{es}ance armed with a pistol and stick; the former to shoot the source of the knocking, and the latter to make his escape (the ghost had remained silent on that occasion). James Penn and John Moore were also on the committee, but its most prominent member was Dr Samuel Johnson,[32] who documented the s^{es}ance, held on 1st February 1762:

On the night of the 1st of February many gentlemen eminent for their rank and character were, by the invitation of the Reverend Mr. Aldrich, of Clerkenwell, assembled at his house, for the examination of the noises supposed to be made by a departed spirit, for the detection of some enormous crime. About ten at night the gentlemen met in the chamber in which the girl, supposed to be disturbed by a spirit, had, with proper caution, been put to bed by several ladies. They sat rather more than an hour, and hearing nothing, went down stairs, when they interrogated the father of the girl, who denied, in the strongest terms, any knowledge or belief of fraud. The supposed spirit had before publicly promised, by an affirmative knock, that it would attend one of the gentlemen into the vault under the Church of St. John, Clerkenwell, where the body is deposited, and give a token of her presence there, by a knock upon her coffin; it was therefore determined to make this trial of the existence or veracity of the supposed spirit. While they were enquiring and deliberating, they were summoned into the girl's chamber by some ladies who were near her bed, and who had heard knocks and scratches. When the gentlemen entered, the girl declared that she felt the spirit like a mouse upon her back, and was required to hold her hands out of bed. From that time, though the spirit was very solemnly required to manifest its existence by appearance, by impression on the hand or body of any present, by scratches, knocks, or any other agency,

no evidence of any preter-natural power was exhibited. The spirit was then very seriously advertised that the person to whom the promise was made of striking the coffin, was then about to visit the vault, and that the performance of the promise was then claimed. The company at one o'clock went into the church, and the gentleman to whom the promise was made, went with another into the vault. The spirit was solemnly required to perform its promise, but nothing more than silence ensued: the person supposed to be accused by the spirit, then went down with several others, but no effect was perceived. Upon their return they examined the girl, but could draw no confession from her. Between two and three she desired and was permitted to go home with her father. It is, therefore, the opinion of the whole assembly, that the child has some art of making or counterfeiting a particular noise, and that there is no agency of any higher cause.

â ~ Samuel Johnson (1762)[33]

Disappointed that the ghost had failed to reveal itself, Moore now told Kent he believed it was an imposter, and that he would help reveal it. Kent asked him to admit the truth and write an affidavit of what he knew, so as to end the affair and restore Kent's reputation, but Moore refused, telling him that he still believed that the spirit's presence was a reminder of his sin.[34][nb 4] Moore's view of the couple's relationship was shared by many, including Mrs Parsons, who believed that the supposed ghost of Elizabeth Kent had disapproved of her sister's new relationship.[36]

Another sã@ance on 3Â February saw the knocking continue unabated, but by then Parsons was in an extremely difficultâ ~and seriousâ ~situation. Keen to prove the ghost was not an imposture he allowed his daughter to be examined at a house on The Strand from 7Â ~10Â February, and at another house in Covent Garden from 14Â February. There she was tested in a variety of ways which included being swung up in a hammock, her hands and feet extended. As expected, the noises commenced, but stopped once Elizabeth was made to place her hands outside the bed. For two nights the ghost was silent. Elizabeth was told that if no more noises were heard by Sunday 21Â February, she and her father would be committed to Newgate Prison. Her maids then saw her conceal on her person a small piece of wood about 6Â by 4Â inches (150 by 100Â mm), and informed the investigators. More scratches were heard but the observers concluded that Elizabeth was responsible for the noises, and that she had been forced by her father to make them. Elizabeth was allowed home shortly after.[37][38]

On or about 25Â February, a pamphlet sympathetic to Kent's case was published, called *The Mystery Revealed*, and most likely written by Oliver Goldsmith.[39] Meanwhile, Kent was still trying to clear his name, and on 25Â February he went to the vault of St John's, accompanied by Aldrich, the undertaker, the clerk and the parish sexton. The group was there to prove beyond any doubt that a recent newspaper report, which claimed that the supposed removal of Fanny's body from the vault accounted for the ghost's failure to knock on her coffin, was false. The undertaker removed the lid to expose Fanny's corpse, "and a very awful shocking sight it was".[40] For Moore this was too much and he published his retraction:

In justice to the person, whose reputation has been attacked in a most gross manner, by the pretended Ghost in Cock-lane; to check the credulity of the weak; to defeat the attempts of the malicious, and to prevent further imposition, on account of this absurd phenomenon, I do hereby certify, that though, from the several attendances on this occasion, I have not been able to point out, how, and in what manner, those knockings and scratchings, of the supposed Ghost, were contrived, performed, and continued; yet, that I am convinced, that those knockings and scratchings were the effects of some artful, wicked contrivance; and that I was, in a more especial manner, convinced of its being such, on the first of this month, when I attended with several persons of rank and character, who assembled at the Rev. Mr. Aldrich's, Clerkenwell, in order to examine into this iniquitous imposition upon the

Public. Since which time I have not seen the child, nor heard the noises; and think myself in duty bound to add, that the injured person (when present to hear himself accused by the pretended Ghost) has not, by his behaviour, given the least ground of suspicion, but has preserved that becoming steadfastness, which nothing, I am persuaded, but innocence could inspire.

It was not enough to keep him from being charged by the authorities with conspiracy, along with Richard Parsons and his wife, Mary Frazer, and Richard James, a tradesman.[42]

The trial of all five was held at the Guild Hall in London on 10th July 1762. Presiding over the case was Lord Chief Justice William Murray. Proceedings began at 10th am, "brought by William Kent against the above defendants for a conspiracy to take away his life by charging him with the murder of Frances Lynes by giving her poison whereof she died". The courtroom was crowded with spectators, who watched as Kent gave evidence against those in the dock. He told the court about his relationship with Fanny and of her resurrection as "Scratching Fanny" (so-called because of the scratching noises made by the "ghost").[7] James Franzen was next on the stand, his story corroborated by Fanny's servant, Esther "Carrots" Carlisle, who testified later that day. Dr Cooper, who had served Fanny as she lay dying, told the court that he had always believed the strange noises in Cock Lane to be a trick, and his account of Fanny's illness was supported by her apothecary, James Jones. Several other prosecution witnesses described how the hoax had been revealed, and Richard James was accused by the prosecution's last witness of being responsible for some of the more offensive material published in the Public Ledger.[43]

The defence's witnesses included some of those who had cared for Elizabeth Parsons, and who presumably still believed that the ghost was real. Other witnesses included the carpenter responsible for removing the wainscoting from Parsons' apartment and Catherine Friend, who to escape the knocking noises had left the property. One witness's testimony caused the court to burst into laughter, at which she replied "I assure you gentlemen, it is no laughing matter, whatever you may think of it." Reverend Thomas Broughton was also called, as was Reverend Ross, one of those who had questioned the ghost. Judge Murray asked him "Whether he thought he had puzzled the Ghost, or the Ghost had puzzled him?" John Moore was offered support by several esteemed gentlemen and presented Murray with a letter from the Archbishop of Canterbury, Thomas Secker, who sought to intercede on his behalf. Murray placed the letter in his pocket, unopened, and told the court "it was impossible it could relate to the cause in question." Richard James and Richard Parsons also received support from various witnesses, some of whom although acknowledging Parsons' drink problem, told the court they could not believe he was guilty.[43]

The trial ended at about 9:30th pm. The judge spent about 90th minutes summing up the case, but it took the jury only 15th minutes to reach a verdict of guilty for all five defendants. The following Monday, two others responsible for defaming Kent were found guilty and later fined £50 each. The conspirators were brought back on 22th November but sentencing was delayed in the hope that they could agree on the level of damages payable to Kent. Having failed to do so they returned on 27th January 1763 and were committed to the King's Bench Prison until 11th February, by which time John Moore and Richard James had agreed to pay Kent £588; they were subsequently admonished by Justice Wilmot and released. The following day, the rest were sentenced:[44]

The Court chusing that Mr. Kent, who had been so much injured on the occasion, should receive some reparation by punishment of the offenders, deferred giving judgment for seven or eight months, in hopes that the parties might make it up in the meantime. Accordingly, the clergyman, and tradesman agreed to pay Mr. Kent a round sum ~some say between £500 and £600 to purchase their pardon, and were, therefore, dismissed with a severe reprimand. The father was ordered to be set in the pillory three times in one month ~once at the end of Cock Lane; Elizabeth his wife to be imprisoned one year; and Mary Frazer six months in

Bridewell, with hard labour. The father appearing to be out of his mind at the time he was first to standing in the pillory, the execution of that part of his sentence was deferred to another day, when, as well as the other day of his standing there, the populace took so much compassion on him, that instead of using him ill, they made a handsome subscription for him.
â ~Annual Register, vol cxlii. and Gentleman's Magazine, 1762, p. 43 and p. 339[45]

Parsons, all the while protesting his innocence, was also sentenced to two years imprisonment. He stood in the pillory on 16th March, 30th March and finally on 8th April. In contrast to other criminals the crowd treated him kindly, making collections of money for him.[44]

[edit] Legacy

The Cock Lane ghost was a focus for a contemporary religious controversy between the Methodists, and the orthodox Anglicans. Belief in a spiritual afterlife is a requirement for most religions, and in every instance where a spirit had supposedly manifested itself in the real world, the event was cherished as an affirmation of such beliefs.[47] In his youth, John Wesley had been strongly influenced by a supposed haunting at his family home and these experiences were carried through to the religion he founded, which was regularly criticised for its position on witchcraft and magic. Methodism, although far from a united religion, became almost synonymous with a belief in the supernatural.[48] Some of its followers therefore gave more credence to the reality of the Cock Lane ghost than did the Anglican establishment, which considered such things to be relics of the country's Catholic past. This was a view that was epitomised in the conflict between the Methodist John Moore and the Anglican Stephen Aldrich.[49] In his 1845 memoirs, Horace Walpole, who had attended one of the s^{an}ctances, accused the Methodists of actively working to establish the existence of ghosts. He described the constant presence of Methodist clergymen near Elizabeth Parsons and implied that the church would recompense her father for his troubles.[50]

Samuel Johnson was committed to his Christian faith and shared the views of author Joseph Glanvill, who, in his 1681 work *Saducismus Triumphatus*, wrote of his concern over the advances made against religion and a belief in witchcraft, by atheism and scepticism. For Johnson the idea that an afterlife might not exist was an appalling thought, but although he thought that spirits could protect and counsel those still living, he kept himself distant from the more credulous Methodists, and recognised that his religion required proof of an afterlife.[51] Ever a sceptic, in his discussions with his biographer James Boswell, he said:

Sir, I make a distinction between what a man may experience by the mere strength of his imagination, and what imagination cannot possibly produce. Thus, suppose I should think I saw a form, and heard a voice cry, "Johnson, you are a very wicked fellow, and unless you repent you will certainly be punished;" my own unworthiness is so deeply impressed upon my mind, that I might imagine I thus saw and heard, and therefore I should not believe that an external communication had been made to me. But if a form should appear, and a voice tell me that a particular man had died at a particular place, and a particular hour, a fact which I had no apprehension of, nor any means of knowing, and this fact, with all its circumstances, should afterwards be unquestionably proved, I should, in that case, be persuaded that I had supernatural intelligence imparted to me.[52]

Johnson's role in revealing the nature of the hoax was not enough to keep the satirist Charles Churchill from mocking his apparent credulity in his 1762 work *The Ghost*. [53] He resented Johnson's lack of enthusiasm for his writing and with the character of 'Pomposo', written as one of the more credulous of the ghost's investigators, used the satire to highlight a "superstitious streak" in his subject. Johnson paid this scant attention, but was said to have been more

upset when Churchill again mocked him for his delay in releasing Shakespeare.[54] Publishers were at first wary of attacking those involved in the supposed haunting, but Churchill's satire was one of a number of publications which, following the exposure of Parsons' deception, heaped scorn on the affair. The newspapers searched for evidence of past impostures and referenced older publications such as Reginald Scot's *Discoverie of Witchcraft* (1584).[55] The ghost was referenced in an anonymous work entitled *Anti-Canidia: or, Superstition Detected and Exposed* (1762), which sought to ridicule the credulity of those involved in the Cock Lane case. The author described his work as a "sally of indignation at the contemptible wonder in Cock-lane".[56] Works such as *The Orators* (1762) by Samuel Foote, were soon available.[57][58] Farcical poems such as *Cock-lane Humbug* were released, theatres staged plays such as *The Drummer*, and *The Haunted House*. [59]

Oliver Goldsmith, who had in February 1762 published *The Mystery Revealed*, may also have been responsible for the satirical illustration, *English Credulity or the Invisible Ghost* (1762). It shows a scene as envisioned by the artist, with the ghost hovering above the heads of the two children in the bed. To the right of the bed a woman deep in prayer exclaims "O! that they would lay it in the Red Sea!" Another cries "I shall never have any rest again". The English magistrate and social reformer John Fielding, who was blind, is pictured entering from the left saying "I should be glad to see this spirit", while his companion says "Your Wâ ~â ~r's had better get your Warrant back'd by his Lâ ~rdsâ ~p", referring to a Middlesex magistrate's warrant which required an endorsement from the Lord Mayor, Samuel Fludyer. A man in tall boots, whip in hand, says: "Ay Tom I'll lay 6Â toÂ 1 it runs more nights than the Coronation"[nb 5] and his companion remarks "How they swallow the hum". A clergymen says "I saw the light on the Clock" while another asks "Now thou Infidel does thou not believe?", prompting his neighbour to reply "Yes if it had happen'd sooner 't would have serv'd me for a new Charater in the Lyar the Story would tell better than the Cat & Kittens".[nb 6] Another clergyman exclaims "If a Gold Watch knock 3Â times", and a Parson asks him "Brother don't disturb it". On the wall, an image of *The Bottle Conjuror* is alongside an image of Elizabeth Canning, whose fraud had so worried Samuel Fludyer that he had refused to arrest either Parsons or Kent.[62]

Playwright David Garrick dedicated the enormously successful *The Farmer's Return* to the satirical artist William Hogarth. The story concerns a farmer who regales his family with an account of his talk with Miss Fanny, the comedy being derived from the reversal of traditional roles: the sceptical farmer poking fun at the credulous city-folk.[59][63] Hogarth made his own observations of the Cock Lane ghost, with obvious references in *Credulity, Superstition and Fanaticism* (1762). This illustration makes a point of attacking Methodist ministers, one of whom is seen to slip a phallic "ghost" into a young woman's bodice.[46] He again attacked the Methodists in *The Times*, PlateÂ 2 (1762â ^1763), placing an image of Thomas Secker (who had tried to intervene on behalf of the Methodists) behind the Cock Lane ghost, and putting the ghost in the same pillory as the radical politician John Wilkes, which implied a connection between the demagoguery surrounding the Methodists and Pittites.[64][65] The print enraged Bishop William Warburton, who although a vocal critic of Methodism, wrote:

I have seen Hogarth's print of the Ghost. It is a horrid composition of lewd Obscenity & blasphemous prophaneness for which I detest the artist & have lost all esteem for the man. The best is, that the worst parts of it have a good chance of not being understood by the people.[63]

The 19th-century author Charles Dickensâ ~whose childhood nursemaid Mary Weller may have affected him with a fascination for ghostsâ ~made reference to the Cock Lane ghost in several of his books.[nb 7][67] One of Nicholas Nickleby's main characters and a source of much of the novel's comic relief, Mrs. Nickleby, claims that her great-grandfather "went to school with the Cock-lane Ghost" and

that "I know the master of his school was a Dissenter, and that would in a great measure account for the Cock-lane Ghost's behaving in such an improper manner to the clergyman when he grew up." [68] Dickens also very briefly mentions the Cock Lane ghost in *A Tale of Two Cities* [69] and *Dombey and Son*. [70]

[edit] References

Footnotes

- [^] Based on the RPI, about £27,400 as of 2010. [3]
- [^] The result of these proceedings is not mentioned.
- [^] Evidence of these investigations exists in a letter which appeared in a newspaper in February 1762, signed by a "J. A. L.", which gave a detailed report on how Fanny had arrived in London, and which claimed that Kent had drawn up Fanny's will in his favour. It made no specific accusations, but as its author observed, Kent's actions had had "the desired effect". Kent later claimed to know the identity of its author, who, Grant (1965) surmises, was a member of the Lynes family. Grant also writes that the letter was printed to maintain pressure on Kent. [25]
- [^] Kent did, however, manage to issue an affidavit, signed by Fanny's doctor and her apothecary on 8th February. [35]
- [^] The Coronation was a theatrical play based on the coronation of George III. [61]
- [^] The Liar was a comedy in three acts produced by the dramatist Samuel Foote. [61]
- [^] Slater (1983) theorises that Weller may not have provided Dickens with the ghostly stories that affected his childhood. [66]

Notes

- [^] Benedict 2002, p.th 171
- [^] Grant 1965, pp.th 6th [^]7
- [^] Officer, Lawrence H., *Purchasing Power of British Pounds from 1264 to Present*, measuringworth.com, <http://www.measuringworth.com/ppoweruk/>, retrieved 13 January 2010
- [^] a b Grant 1965, pp.th 4th [^]10
- [^] Grant 1965, pp.th 4th [^]6
- [^] Grant 1965, p.th 10
- [^] a b c d e Seccombe, Thomas; Shore, Rev Heather (2004), "Parsons, Elizabeth (1749th [^]1807)" ((subscription or UK public library membership required)), *Oxford Dictionary of National Biography* (Oxford University Press), doi:10.1093/ref:odnb/21456, <http://www.oxforddnb.com/view/article/21456>, retrieved 21 December 2009
- [^] Chambers 2006, pp.th 39th [^]40
- [^] Grant 1965, pp.th 14th [^]15
- [^] a b Chambers 2006, p.th 28
- [^] a b Grant 1965, pp.th 12th [^]13
- [^] Grant 1965, pp.th 13th [^]16
- [^] Grant 1965, pp.th 16th [^]19
- [^] Lang 1894, p.th 165
- [^] Grant 1965, pp.th 20th [^]21
- [^] Grant 1965, pp.th 23th [^]25
- [^] a b Benedict 2002, p.th 172
- [^] a b c Grant 1965, pp.th 26th [^]29
- [^] Hawkins 1883, p.th 45
- [^] Chambers 2006, pp.th 80th [^]87
- [^] Grant 1965, pp.th 30th [^]32
- [^] Grant 1965, pp.th 32th [^]34
- [^] Grant 1965, pp.th 34th [^]36
- [^] Grant 1965, pp.th 38th [^]41
- [^] Grant 1965, p.th 43

^ Grant 1965, pp.Â 41â ^44
 ^ a b Grant 1965, p.Â 54
 ^ MacKay 1852, p.Â 232
 ^ Westwood & Simpson 2005, pp.Â 463â ^464
 ^ Grant 1965, pp.Â 44â ^45, 51â ^52
 ^ Grant 1965, pp.Â 55â ^56
 ^ Grant 1965, pp.Â 56â ^57
 ^ Boswell & Malone 1791, pp.Â 220â ^221
 ^ Grant 1965, p.Â 73
 ^ Grant 1965, p.Â 77
 ^ Chambers 2006, pp.Â 39â ^42
 ^ Grant 1965, pp.Â 73â ^76
 ^ Lang 1894, p.Â 169
 ^ Goldsmith & Cunningham 1854, p.Â 364
 ^ Grant 1965, pp.Â 76â ^77
 ^ Grant 1965, pp.Â 77â ^78
 ^ Grant 1965, p.Â 80
 ^ a b Grant 1965, pp.Â 110â ^112
 ^ a b Grant 1965, pp.Â 113â ^114
 ^ Walpole & Le Marchant 1845, p.Â 148
 ^ a b Cody 2005, pp.Â 143â ^144
 ^ Grant 1965, p.Â 60
 ^ Davies 1999, pp.Â 12â ^14
 ^ Chambers 2006, pp.Â 47â ^54, 87
 ^ Walpole & Le Marchant 1845, pp.Â 146â ^147
 ^ Grant 1965, pp.Â 60â ^63
 ^ Boswell 1791, p.Â 219
 ^ Sambrook, James (2006), "Churchill, Charles (1732â ^1764)" ((subscription or UK public library membership required)), Oxford Dictionary of National Biography (Oxford University Press), doi:10.1093/ref:odnb/5397, <http://www.oxforddnb.com/view/article/5397>, retrieved 21 December 2009
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 ^ Addington Bruce 1908, pp.Â 81â ^101
 ^ Benedict 2002, p.Â 173
 ^ a b Clery 1999, pp.Â 14â ^16
 ^ Dobson 2000, p.Â 300
 ^ a b Hawkins 1883, p.Â 46
 ^ Hawkins 1883, pp.Â 45â ^46
 ^ a b Paulson 1993, p.Â 366
 ^ Paulson 1993, pp.Â 392â ^393
 ^ Walpole & Le Marchant 1845, p.Â 150
 ^ Slater 1983, p.Â 383
 ^ Amerongen 1972, p.Â 218
 ^ Dickens 1838â ^39, p.Â 655
 ^ Dickens 1859, p.Â 1
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[edit] Further reading
 [edit] External links

Minnie Pwerle (also Minnie Purla[1] or Minnie Motorcar Apwerl[2] born between 1910 and 1922 - 18 March 2006) was an Australian Aboriginal artist. She came from Utopia, Northern Territory (Unupurna in local language), a cattle station in the Sandover area of Central Australia 300 kilometres (190 mi) northeast of

Alice Springs.

Minnie began painting in 2000 at about the age of 80, and her pictures soon became popular and sought-after works of contemporary Indigenous Australian art. In the years after she took up painting on canvas, until she died in 2006, Minnie's works were exhibited around Australia and collected by major galleries, including the Art Gallery of New South Wales, the National Gallery of Victoria and the Queensland Art Gallery. With popularity came pressure from those keen to acquire her work. She was allegedly "kidnapped" by people who wanted her to paint for them, and there have been media reports of her work being forged. Minnie's work is often compared with that of her sister-in-law Emily Kame Kngwarreye, who also came from the Sandover and took up acrylic painting late in life. Minnie's daughter, Barbara Weir, is a respected artist in her own right.

[edit] Personal life

Minnie was born in the early 20th century near Utopia, Northern Territory, 300 kilometres (190 mi) north-east of Alice Springs, Northern Territory.[3] Utopia was a cattle station that was returned to Indigenous ownership in the late 1970s.[4] It is part of a broader region known as the Sandover, containing about 20 Indigenous outstations and centred on the Sandover River.[5] Minnie was one of the traditional owners of Utopia station recognised in the 1980 Indigenous land claim made over the property;[1] her particular country was known as Atnwengerrp.[3]

Pwerle (in the Anmatyerre language) or Apwerle (in Alyawarr) is a skin name, one of 16 used to denote the subsections or subgroups in the kinship system of central Australian Indigenous people. These names define kinship relationships that influence preferred marriage partners, and may be associated with particular totems. Although they may be used as terms of address, they are not surnames in the sense used by Europeans.[6][7] Thus "Minnie" is the element of the artist's name that is specifically hers.

Estimates of Minnie's birthdate vary widely. The National Gallery of Victoria estimates around 1915;[2] Birnberg's biographical survey of Indigenous artists from central Australia gives a birth date of around 1920;[8] The new McCulloch's Encyclopedia of Australian Art suggests around 1922;[3] Elizabeth Fortescue's biographical essay in Art of Utopia offers a range between 1910 and 1920.[9] The uncertainty arises because Indigenous Australians often estimate dates of birth by comparison with other events, especially for those born before contact with European Australians.[10] Minnie was one of six children, and had three sisters: Molly, born around 1920, Emily, born around 1922, and Galya, born in the 1930s.[9] She was of the Anmatyerre and Alyawarre Aboriginal language groups.[2][8]

In about 1945, Minnie had an affair with a married man,[11] Jack Weir, described by one source as a pastoral station owner,[3] by a second as "an Irish Australian man who owned a cattle run called Bundy River Station", and by another as an Irish "stockman".[12] A relationship such as that between Minnie and Weir was illegal, and the pair were jailed; Weir died shortly after his release.[12] Minnie had a child from their liaison, who was partly raised by Minnie's sister-in-law, artist Emily Kngwarreye,[13][14] and became prominent Indigenous artist Barbara Weir. Barbara Weir was one of the Stolen Generations. At about the age of nine, she was forcibly taken from her family, who believed she had then been killed. The family were reunited in the late 1960s, but Barbara did not form a close bond with Minnie. Barbara married Mervyn Torres, and as of 2000 had six children and thirteen grandchildren.[9][12][15]

Minnie went on to have six further children with her husband "Motorcar" Jim Ngala,[3] including Aileen, Betty, Raymond and Dora Mpetyane, and two others who by 2010 had died.[16] Her grandchildren include Fred Torres, who founded private art gallery DACOU in 1993,[17] and artist Teresa Purla (or Pwerle).[18]

Minnie began painting in late 1999[9] or 2000,[3] when she was almost 80. When asked why she had not begun earlier (painting and batik works had been created at Utopia for over 20 years), her daughter Barbara Weir reported Minnie's answer as being that "no-one had asked her".[19] By the 2000s, she was reported

as living at Alparra, the largest of Utopia's communities, or at Urultja (also Irrultja, again in the Sandover region).[13] Sprightly and outgoing, even in her eighties she could outrun younger women chasing goannas for bushfood, and she continued to create art works until two days before her death on 18th March 2006.[3][8][20] She was outlived by all her sisters except Maggie Pwerle, mother of artists Gloria and Kathleen Petyarre (or Pitjara).[9]

[edit] Career

In the 1970s and 1980s Utopia became well known for the design and production of batiks.[21] By 1981 there were 50⁺ artists at Utopia creating batik works;[22] 88 artists participated in a major design project supported by the Central Australian Aboriginal Media Association.[4] Although several sources comment that artistic activity at Utopia began with batik and only later moved to painting, they do not state whether or not Minnie was a textile artist before she took up the brush. The National Gallery of Victoria's brief biography suggests that she did not participate in the making of batik, but she was aware of it.[2]

When Minnie decided to take up painting in 2000, the reception was immediately positive: she had her first solo exhibition that same year at Melbourne's Flinders Lane Gallery.[3] She was first selected to exhibit in the National Aboriginal and Torres Strait Islander Art Award in 2002.[23] One of her pieces, Awelye Atnwengerrp, was exhibited in the 2003 Award, in which her name was given as Minnie Motorcar Apwerl (Pwerle). The artist's asking price for the picture, A\$44,000, was the second-highest in the exhibition and the highest for an artist from the central and western deserts.[24] Her painting Awelye Atnwengerrp 2 was exhibited in the 2005 competition.[25] She was named by Australian Art Collector as one of Australia's 50 most collectible artists in 2004.[26]

There were many group and solo exhibitions of Minnie's work at private galleries between 2000 and 2006. These included exhibitions at Japinka Gallery in Western Australia in 2003 and 2005,[27] Adelaide's Dacou Gallery in 2000 and 2002,[23] Sydney's Gallery Savah between 2000 and 2002 as well as in 2006,[28] and Melbourne's Flinders Lane Gallery in 2000, 2004 and 2006, the last of which was a joint exhibition conducted with her three sisters,[29] all of whom are artists in their own right.[3][9]

Desert art specialist Professor Vivien Johnson noted that Minnie was one of the Utopia artists whose style was "radically different from [that of] all the other painting communities in the Western Desert" and "stunningly successful in the market place".[30] Her most famous fellow artist was Emily Kngwarreye, whose painting Earth's Creation in 2007 sold for over \$1 million, setting a record for the price paid for a painting by an Indigenous Australian artist.[31] Unlike Minnie, Emily had been an active participant in the early batik movement at Utopia.[32]

Minnie (like Emily) was often placed under considerable pressure to produce works.[3] She was reportedly "kidnapped" by people "keen to go to often quite bizarre lengths to acquire" her work.[3] Minnie's experience reflected broader issues in the industry surrounding artists, who were often older, had limited education or English language ability, and faced serious poverty both themselves and amongst their families.[33] In addition to being pressured to paint by others, there were media reports suggesting that some of the vast number of paintings traded under Minnie's name were not created by her at all.[34][35]

[edit] Style of painting

Minnie's style was spontaneous, and typified by "bold" and "vibrant" colour executed with great freedom.[8][36] Her works, such as Anunapa, Akali held by the National Gallery of Victoria, were executed in acrylic (often referred to as synthetic polymer) paint on canvas.[2] As with other contemporary artists of the central and western deserts, her paintings included depictions of stories or features for which she had responsibility within her family or clan, such as the Awelye Atnwengerrp dreaming (or Women's Dreaming). Indigenous art expert Jenny Green believes Minnie's work continues the tradition of "gestural

abstractionism" established by Emily Kngwarreye, which contrasted with the use of recognisable traditional motifsâ ~such as animal tracksâ ~in the works of Western Desert artists.[37] Brisbane artist and gallerist Michael Eather has likened her work not only to that of Emily, but also to Australian abstract impressionist artist Tony Tuckson.[38]

Minnie's paintings include two main design themes. The first is free-flowing and parallel lines in a pendulous outline, depicting the body painting designs used in women's ceremonies, or awelye.[8][9] The second theme involves circular shapes, used to symbolise bush tomato (*Solanum chippendalei*), bush melon, and northern wild orange (*Capparis umbonata*), among a number of forms of bushfood represented in her works.[9][36] Together, the designs were characterised by one reviewer as "broad, luminescent flowing lines and circles".[13]

[edit] Legacy

Minnie's art was quickly added to major public collections such as the Art Gallery of NSW, Art Gallery of South Australia, National Gallery of Victoria and Queensland Art Gallery.[3] It was also included in a 2009 exhibition of Indigenous Australian painting at the New York Metropolitan Museum of Art.[39] Her works later formed the basis of a series of designer rugs,[40] and, together with paintings by her sisters, illustrated the cover of art critic Benjamin Genocchio's book, *Dollar Dreaming*. [41] Described by art dealer Hank Ebes as the works of "a genius", Minnie's paintings were typically selling for \$5,000 in 2005; the highest price fetched on the secondary market at that time was \$43,000.[38]

Regarded as one of Australia's leading contemporary women artists, Minnie ranks alongside other notable Indigenous female painters Dorothy Napangardi, Gloria Petyarre and Kathleen Petyarre.[42][43] One of a number of women such as Emily Kngwarreye who dominated central and western desert painting in the first decade of the 21st century,[44] Minnie is considered to be one of Australia's best-known Indigenous artists,[9] whose work "the market couldn't get enough [of]".[3]

[edit] Major collections

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[edit] External links

Persondata

Name

Minnie Pwerle

Alternative names

Minnie Purla, Motorcar Apwerl

Short description

Indigenous Australian artist from Utopia, Northern Territory

Date of birth

c. 1915

Place of birth

Utopia, Northern Territory

Date of death

18 March 2006

Place of death

Diane Keaton (born Diane Hall; January 5, 1946) is an American film actress, director, producer, and screenwriter. Keaton began her career on stage, and made her screen debut in 1970. Her first major film role was as Kay Adams-Corleone in *The Godfather* (1972), but the films that shaped her early career were those with director and co-star Woody Allen beginning with *Play It Again, Sam* in 1972. Her next two films with Allen, *Sleeper* (1973) and *Love and Death* (1975), established her as a comic actor. Her fourth, *Annie Hall* (1977), won her the Academy Award for Best Actress.

Keaton subsequently expanded her range to avoid becoming typecast as her Annie Hall persona. She became an accomplished dramatic performer, starring in *Looking for Mr. Goodbar* (1977) and received Academy Award nominations for *Reds* (1981) and *Marvin's Room* (1996). Some of her popular later films include *Baby Boom* (1987), *Father of the Bride* (1991), *The First Wives Club* (1996), *Something's Gotta Give* (2003) and *The Family Stone* (2005). Keaton's films have earned a cumulative gross of over US\$1.1Â billion in North America.[1] In addition to acting, she is also a photographer, real estate developer, author, and occasional singer.

[edit] Early life and education

Keaton was born as Diane Hall on January 5, 1946 in Los Angeles, California.[2] Her mother, Dorothy Deanne (nÃ@e Keaton; 1921â ^2008), was a homemaker and amateur photographer; her father, Jack Newton Ignatius Hall (1921â ^1990), was a real estate broker and civil engineer.[2][3] Her father, from Nebraska, came from an Irish-American Catholic background, and her mother, originally from Kansas, came from a Methodist family. Keaton was raised a Methodist by her mother.[4] Her first ambition to become an actress came after seeing her mother win the "Mrs. Los Angeles" pageant for homemakers. Keaton has said that the theatricality of the event inspired her to become a stage

actress.[5] She has also credited Katharine Hepburn, whom she admires for playing strong and independent women, as one of her inspirations.[6]

Keaton is a 1963 graduate of Santa Ana High School in Santa Ana, California. During her time there, she participated in singing and acting clubs at school, and starred as Blanche DuBois in a school production of *A Streetcar Named Desire*. After graduation, she attended Santa Ana College, and later Orange Coast College as an acting student, but dropped out after a year to pursue an entertainment career in Manhattan.[7] Upon joining the Actors' Equity Association, she adopted the surname of Keaton, her mother's maiden name, as there was already a registered Diane Hall.[8] For a brief time, she also moonlighted at nightclubs with a singing act.[9] She would later revisit her nightclub act in *Annie Hall* (1977) and a cameo in *Radio Days* (1987).

Keaton began studying acting at the Neighborhood Playhouse in New York City. She initially studied acting under the Meisner technique, an ensemble acting technique first evolved in the 1930s by Sanford Meisner, a New York stage actor/acting coach/director who had been a member of The Group Theater (1931â1940). She has described her acting technique as, "[being] only as good as the person you're acting with ... As opposed to going it on my own and forging my path to create a wonderful performance without the help of anyone. I always need the help of everyone!"[9] According to her *Reds* co-star Warren Beatty, "She approaches a script sort of like a play in that she has the entire script memorized before you start doing the movie, which I don't know any other actors doing that." [10]

In 1968, Keaton became a member of the "Tribe" and understudy to Sheila in the original Broadway production of *Hair*. [11] She gained some notoriety for her refusal to disrobe at the end of Act I when the cast performs nude, even though nudity in the production was optional for actors (Those who performed nude received a \$50 bonus). [5] [12] After acting in *Hair* for nine months, she auditioned for a part in Woody Allen's production of *Play It Again, Sam*. After nearly being passed over for being too tall (at 5' 8 in./1.73 m she is two inches/5 cm taller than Allen), she won the part. [3]

[edit] Career

After being nominated for a Tony Award for *Play It Again, Sam*, Keaton made her film debut in 1970's *Lovers and Other Strangers*. She followed with guest roles on the television series *Love, American Style* and *Night Gallery*, and *Mannix*. Between films, Keaton appeared in a series of deodorant commercials.

Keaton's breakthrough role came two years later when she was cast as Kay Adams, the girlfriend and eventual wife of Michael Corleone (played by Al Pacino) in Francis Ford Coppola's 1972 blockbuster *The Godfather*. Coppola noted that he first noticed Keaton in *Lovers and Other Strangers*, and cast her because of her reputation for eccentricity that he wanted her to bring to the role [13] (Keaton claims that at the time she was commonly referred to as "the kooky actress" of the film industry). [5] Her performance in the film was loosely based on her real life experience of making the film, both of which she has described as being "the woman in a world of men". [5] *The Godfather* was an unparalleled critical and financial success, becoming the highest grossing film of the year and winning the Best Picture Oscar of 1972.

Two years later she reprised her role as Kay Adams in *The Godfather Part II*. She was initially reluctant, stating that, "At first, I was skeptical about playing Kay again in the *Godfather* sequel. But when I read the script, the character seemed much more substantial than in the first movie." [7] In *Part II* her character changed dramatically, becoming more embittered about her husband's activities. Even though Keaton received widespread exposure from the films, her character's importance was minimal. Time wrote that she was "invisible in *The Godfather* and pallid in *The Godfather, Part II*." [14]

Keaton's other notable films of the 1970s included many collaborations with Woody Allen. Although by the time they made films together, their romantic involvement had ended, she played many eccentric characters in several of his comic and dramatic films including *Sleeper*, *Love and Death*, *Interiors*, *Manhattan*, and the film version of *Play It Again, Sam*, directed by Herbert

Ross. Allen has credited Keaton as his muse during his early film career.[15]

In 1977, Keaton starred with Allen in the romantic comedy *Annie Hall*, one of her most famous roles. *Annie Hall* was written and directed by Allen and the film was believed to be autobiographical of his relationship with Keaton. Allen based the character of Annie Hall loosely on Keaton ("Annie" is a nickname of hers, and "Hall" is her original surname). Many of Keaton's mannerisms and her self-deprecating sense of humor were added into the role by Allen. (Director Nancy Meyers has claimed "Diane's the most self-deprecating person alive".[16]) Keaton has also said that Allen wrote the character as an "idealized version" of herself.[17] The two starred as a frequently on-again, off-again couple living in New York City. Her acting was later summed up by CNN as "awkward, self-deprecating, speaking in endearing little whirlwinds of semi-logic", [18] and by Allen as a "nervous breakdown in slow motion." [19] The film was both a major financial and critical success, and won the Academy Award for Best Picture. Keaton's performance also won the Academy Award for Best Actress. In 2006, *Premiere* magazine ranked Keaton in *Annie Hall* as 60th on its list of the "100 Greatest Performances of All Time":

It's hard to play ditzy. ... The genius of Annie is that despite her loopy backhand, awful driving, and nervous tics, she's also a complicated, intelligent woman. Keaton brilliantly displays this dichotomy of her character, especially when she yammers away on a first date with Alvy (Woody Allen) while the subtitle reads, 'He probably thinks I'm a yoyo.' Yo-yo? Hardly.[20]

Keaton's eccentric wardrobe in *Annie Hall*, which consisted mainly of vintage men's clothing, including neckties, vests, baggy pants, and fedora hats, made her an unlikely fashion icon of the late 1970s. Most of the clothing seen in the film came from Keaton herself, who was already known for her tomboyish clothing style years before *Annie Hall*, though Ruth Morley and Ralph Lauren reportedly worked on the movie's costume.[7][21] Soon after the film's release, men's clothing and pantsuits became popular attire for women.[22] She is known to favor men's vintage clothing, and usually appears in public wearing gloves and conservative attire. (A 2005 profile in the *San Francisco Chronicle* described her as "easy to find. Look for the only woman in sight dressed in a turtleneck on a 90-degree afternoon in Pasadena.[23]) Keaton would later reprise her *Annie Hall* appearance when she attended the 2003 Academy Awards presentation in a men's tuxedo and a bowler hat.

Her photo by Douglas Kirkland appeared on the cover of the September 26, 1977, issue *Time* magazine with the story dubbing her "the funniest woman now working in films." [14] Later that year, she departed from her usual lighthearted comic roles when she won the highly coveted lead role in the drama *Looking for Mr. Goodbar*, based on the novel by Judith Rossner. In the film she played a Catholic schoolteacher for deaf children who lives a double life, spending nights frequenting singles bars and engaging in promiscuous sex. Keaton became interested in the role after seeing it as a "psychological case history." [24] The same issue of *Time* commended her role choice and criticized the restricted roles available for female actors in American films:

A male actor can fly a plane, fight a war, shoot a badman, pull off a sting, impersonate a big cheese in business or politics. Men are presumed to be interesting. A female can play a wife, play a whore, get pregnant, lose her baby, and, um, let's see ... Women are presumed to be dull. ... Now a determined trend spotter can point to a handful of new films whose makers think that women can bear the dramatic weight of a production alone, or virtually so. Then there is Diane Keaton in *Looking for Mr. Goodbar*. As Theresa Dunn, Keaton dominates this raunchy, risky, violent dramatization of Judith Rossner's 1975 novel about a schoolteacher who cruises singles bars.[14]

In addition to acting, Keaton has stated that "[I] had a lifelong ambition to be a singer." [25] She had a brief, unrealized career as a recording artist in

the 1970s. Her first record was an original cast recording of *Hair*, in 1971. In 1977, she began recording tracks for a solo album, but the finished record never materialized.[3]

Keaton met with more success in the medium of still photography. Like her character in *Annie Hall*, Keaton had long relished photography as a favorite hobby, an interest she picked up as a teenager from her mother. While traveling in the late 1970s she began exploring her avocation more seriously. "Rolling Stone had asked me to take photographs for them, and I thought, 'Wait a minute, what I'm really interested in is these lobbies, and these strange ballrooms in these old hotels.' So I began shooting them", she recalled in 2003. "These places were deserted, and I could just sneak in anytime and nobody cared. It was so easy and I could do it myself. It was an adventure for me." *Reservations*, her collection of photos of hotel interiors, was published in book form in 1980.[26]

After *Manhattan* in 1979, Keaton and Woody Allen ended their long working relationship, and the film would be their last major collaboration until 1993. In 1978, Keaton became romantically involved with Warren Beatty, and two years later he cast her to play opposite him in *Reds*. In the film, she played Louise Bryant, a journalist and feminist, who flees from her husband to work with radical journalist John Reed (Beatty), and later enters Russia to locate him as he chronicles the Russian Civil War. The *New York Times* wrote that Keaton was, "nothing less than splendid as Louise Bryant—beautiful, selfish, funny and driven. It's the best work she has done to date." [27] Keaton received her second Academy Award nomination for the film.

Beatty cast Keaton after seeing her in *Annie Hall*, as he wanted to bring her natural nervousness and insecure attitude to the role. The production of *Reds* was delayed several times since its conception in 1977, and Keaton almost left the project when she believed it would never be produced. Filming finally began two years later. In a 2006 *Vanity Fair* story, Keaton described her role as "the everyman of that piece, as someone who wanted to be extraordinary but was probably more ordinary ... I knew what it felt like to be extremely insecure." Assistant director Simon Relph later stated that Louise Bryant was one of her most difficult roles, and that "[she] almost got broken." [28]

1984 brought *The Little Drummer Girl*, Keaton's first excursion into the thriller and action genre. *The Little Drummer Girl* was both a financial and critical failure, with critics claiming that Keaton was miscast for the genre, such as one review from *The New Republic* claiming that "the title role, the pivotal role, is played by Diane Keaton, and around her the picture collapses in tatters. She is so feeble, so inappropriate." [29] However, that same year she received positive reviews for her performance in *Mrs. Soffel*, a film based on the true story of a repressed prison warden's wife who falls in love with a convicted murderer and arranges for his escape. Two years later she starred with Jessica Lange and Sissy Spacek in *Crimes of the Heart*, adapted from Beth Henley's Pulitzer Prize-winning play into a moderately successful screen comedy. She starred in her first commercial vehicle with 1987's *Baby Boom*, her first of four collaborations with writer-producer Nancy Meyers. In *Baby Boom*, Keaton starred as a Manhattan career woman who is suddenly forced to care for a toddler. That same year she made a cameo in Allen's film *Radio Days* as a nightclub singer. 1988's *The Good Mother* was a misstep for Keaton. The film was a financial disappointment (according to Keaton, the film was "a Big Failure. Like, BIG failure"), [30] and some critics panned her performance, such as one review from *The Washington Post*: "her acting degenerates into hype—^ as if she's trying to sell an idea she can't fully believe in." [31]

In 1987, Keaton directed and edited her first feature film, a documentary named *Heaven* about the possibility of an afterlife. *Heaven* met with mixed critical reaction, with *The New York Times* likening it to "a conceit imposed on its subjects." [32] Over the next four years, Keaton went on to direct music videos for artists such as Belinda Carlisle, two television films starring Patricia Arquette, and episodes of the series *China Beach* and *Twin Peaks*.

By the 1990s, Keaton had established herself as one of the most popular and

versatile actors in Hollywood. Now middle-aged, she shifted to more mature roles, frequently playing matriarchs of middle-class families. Of her role choices and avoidance of becoming typecast, she said: "Most often a particular role does you some good and Bang! You have loads of offers, all of them for similar roles ... I have tried to break away from the usual roles and have tried my hand at several things." [33]

She began the decade with *The Lemon Sisters*, a poorly received comedy/drama that she starred in and produced, which was shelved for a year after its completion. In 1991, Keaton starred with Steve Martin in the family comedy *Father of the Bride*. She was almost not cast in the film, as the commercial failure of *The Good Mother* had strained her relationship with Walt Disney Pictures, the studio of both films. [30] *Father of the Bride* was Keaton's first major hit after four years of commercial disappointments.

Keaton reprised her role four years later in the sequel, as a woman who becomes pregnant in middle age at the same time as her daughter. A review of the film for *The San Francisco Examiner* was one of many in which Keaton once again received comparison to Katharine Hepburn: "No longer relying on that stuttering uncertainty that seeped into all her characterizations of the 1970s, she has somehow become Katharine Hepburn with a deep maternal instinct, that is, she is a fine and intelligent actress who doesn't need to be tough and edgy in order to prove her feminism." [34]

Keaton reprised her role of Kay Adams in 1990's *The Godfather Part III*. Set 20 years after the end of *The Godfather, Part II*, Keaton's part had evolved into the estranged ex-wife of Michael Corleone. Criticism of the film and Keaton again centered on her character's unimportance in the film. *The Washington Post* wrote: "Even though she is authoritative in the role, Keaton suffers tremendously from having no real function except to nag Michael for his past sins." [35] In 1993, Keaton starred in *Manhattan Murder Mystery*, her first film with Woody Allen since 1979. Her part was originally intended for Mia Farrow, but Farrow dropped out of the project after her split with Allen. [36]

In 1995, Keaton directed *Unstrung Heroes*, her first theatrically released narrative film. The movie, adapted from Franz Lidz's memoir, starred Nathan Watt as a boy in 1960s whose mother (Andie MacDowell) becomes ill with cancer. As her sickness advances and his inventor father (John Turturro) grows increasingly distant, the boy is sent to live with his two eccentric uncles (Maury Chaykin and Michael Richards). In a geographic switch, Keaton shifted the story's setting from the New York of Lidz's book to the Southern California of her own childhood. Though it played in a relatively limited release and made little impression at the box office, the film and its direction were well-received critically. [37]

Keaton's most successful film of the decade was the 1996 comedy *The First Wives Club*. She starred with Goldie Hawn and Bette Midler as a trio of "first wives": middle-aged women who had been divorced by their husbands in favor of younger women. Keaton claimed that making the film "saved [her] life." [38] The film was a major success, grossing US\$105 million at the North American box office, [39] and it developed a cult following among middle-aged women. [40] Reviews of the film were generally positive for Keaton and her co-stars, and she was even referred to by *The San Francisco Chronicle* as "probably [one of] the best comic film actresses alive." [41] In 1997, Keaton, along with Hawn and Midler, was a recipient of the Women in Film Crystal Award, which honors "outstanding women who, through their endurance and the excellence of their work, have helped to expand the role of women within the entertainment industry." [42]

Also in 1996, Keaton starred as Bessie, a woman with leukemia in *Marvin's Room*, an adaptation of the play by Scott McPherson. Meryl Streep played her estranged sister Lee, although had initially been considered for the role of Bessie. The film also starred a young Leonardo DiCaprio as Streep's rebellious son. Roger Ebert stated that "Streep and Keaton, in their different styles, find ways to make Lee and Bessie into much more than the expression of their problems." [43] Keaton earned a third Academy Award nomination for the film.

Although critically acclaimed, the film was not released on a wide scale, possibly costing Keaton the Oscar. Keaton said that the biggest challenge of the role was understanding the mentality of a person with terminal illness.[5]

In 1999 Keaton narrated the one-hour public-radio documentary, "If I Get Out Alive," the first to focus on the conditions and brutality faced by young people in the adult correctional system. The program, produced by Lichtenstein Creative Media, aired on public radio stations across the country, and was honored with a First Place National Headliner Award and a Casey Medal for Meritorious Journalism.[44]

Keaton's first film of 2000 was *Hanging Up* with Meg Ryan and Lisa Kudrow. Keaton also directed the film, despite claiming in a 1996 interview that she would never direct herself in a film, saying "as a director, you automatically have different goals. I can't think about directing when I'm acting." [30] The film was a drama about three sisters coping with the senility and eventual death of their elderly father, played by Walter Matthau. *Hanging Up* rated poorly with critics and grossed a modest US\$36 million at the North American box office.[45]

In 2001, Keaton co-starred with Warren Beatty in *Town & Country*, a critical and financial fiasco. Budgeted at an estimated US\$90 million, the film opened to little notice and grossed only US\$7 million in its North American theatrical run.[46] Peter Travers of *Rolling Stone* claimed that *Town & Country* was "less deserving of a review than it is an obituary....The corpse took with it the reputations of its starry cast, including Warren Beatty and Diane Keaton." [47] Also in 2001, and 2002, Keaton starred in four low-budget television films. She played a fanatical nun in the religious drama *Sister Mary Explains It All*, an impoverished mother in the drama *On Thin Ice*, and a bookkeeper in the mob comedy *Plan B*. In *Crossed Over*, she played Beverly Lowry, a woman who forms an unusual friendship with the only woman executed while on death row in Texas, Karla Faye Tucker.

Keaton's first major hit since 1996 came in 2003's *Something's Gotta Give*, directed by Nancy Meyers and co-starring Jack Nicholson. Nicholson and Keaton, aged 66 and 57 respectively, were seen as bold casting choices for leads in a romantic comedy. Twentieth Century Fox, the film's original studio, reportedly declined to produce the film, fearing that the lead characters were too old to be bankable. Keaton commented about the situation in *Ladies' Home Journal*: "Let's face it, people my age and Jack's age are much deeper, much more soulful, because they've seen a lot of life. They have a great deal of passion and hope~why shouldn't they fall in love? Why shouldn't movies show that?" [48] Keaton played a middle-aged playwright who falls in love with her daughter's much older boyfriend. The film was a major success at the box office, grossing US\$125 million in North America.[49] Roger Ebert wrote that "Nicholson and Keaton bring so much experience, knowledge and humor to their characters that the film works in ways the screenplay might not have even hoped for." [50] The following year, Keaton received her fourth Academy Award nomination for her role in the film.

Keaton's only film between the years of 2004 and 2006 was the comedy *The Family Stone* (2005), starring an ensemble cast that also included Sarah Jessica Parker, Claire Danes, Rachel McAdams, and Craig T. Nelson. In the film, scripted and directed by Thomas Bezucha, Keaton played a breast cancer survivor and matriarch of a big New England family, who reunites at the parents' home for their annual Christmas holidays.[51] The film was released to moderate critical and commercial success,[52] and earned US\$92.2 million worldwide.[53] Keaton received her second Satellite Award nomination for her portrayal,[54] on which Peter Travers of *Rolling Stone* commented, "Keaton, a sorceress at blending humor and heartbreak, honors the film with a grace that makes it stick in the memory." [55]

In 2007, Keaton starred in both *Because I Said So* and *Mama's Boy*. In the romantic comedy *Because I Said So*, directed by Michael Lehmann, Keaton played a long-divorced mother of three daughters, determined to pair off her only single daughter Milly, played by Mandy Moore.[56] Also starring Stephen Collins and

Gabriel Macht, the project opened to overwhelmingly negative reviews by critics, with Wesley Morris of *The Boston Globe* calling it "a sloppily made bowl of reheated chick-flick clichés," and was ranked among the worst-reviewed films of the year.[57][58][59] The following year, Keaton received her first and only Golden Raspberry Award nomination to date.[54] In *Mama's Boy*, director Tim Hamilton's feature film debut, Keaton starred as the mother of a self-absorbed 29-year old (played by Jon Heder) whose world turns upside down when his widowed mother starts dating and considers booting him out of the house. Distributed for a limited release to certain parts of the United States only, the independent comedy garnered largely negative reviews.[60]

In 2008, Keaton starred alongside Dax Shepard and Liv Tyler in Vince Di Meglio's dramedy *Smother*, playing the overbearing mother of an unemployed therapist, who decides to move in with him and his girlfriend following the split from her husband, played by Ken Howard. As with *Mama's Boy*, the film received a limited release only, resulting into minor gross of US\$1.8 million worldwide.[61] Critical reaction to the film was generally unfavorable,[62] and once again Keaton was dismissed for her role choices, with Sandra Hall of the *New York Post* writing, "Diane's career is dyin' [...] this time, sadly, she's gone too far. She's turned herself into a mother-in-law joke." [63] Also in 2008, Keaton appeared alongside Katie Holmes and Queen Latifah in the crime-comedy film *Mad Money*, directed by Callie Khouri. Based on the British television drama *Hot Money* (2001), the film revolves around three female employees of the Federal Reserve who scheme to steal money that is about to be destroyed.[64] As with Keaton's previous projects, the film bombed at the box offices with a gross total of US\$26.4 million,[65] and was universally panned by critics, ranking third in the *New York Post*'s Top 10 Worst Movies of 2008 overview.[66]

In 2010, Keaton starred alongside Rachel McAdams and Harrison Ford in Roger Michell's comedy *Morning Glory*, playing the veteran TV host of a fictional morning talk show that desperately needs to boost its lagging ratings. Portraying a narcissistic character that would do anything to please the audience, Keaton described her role as "the kind of woman you love to hate." [67] Inspired by Neil Simon's 1972 Broadway play *The Sunshine Boys*, [68] the film became a moderate success at the box office for a worldwide total of almost US\$59 million.[69] Though some critics found that Keaton was underused in the film,[70] the actress was generally praised for her performance, with James Berardinelli of *ReelViews* noting that "Diane Keaton is so good at her part that one can see her sliding effortlessly into an anchor's chair on a real morning show." [71]

In fall 2010, Keaton joined the production of the comedy drama *Darling Companion* by Lawrence Kasdan, which was released in 2012. Co-starring Kevin Kline and Dianne Wiest and set in Telluride, Colorado,[72] the film follows a woman, played by Keaton, whose husband loses her much-beloved dog at a wedding held at their vacation home in the Rocky Mountains, resulting in a search party to find the pet.[73] Kasdan's first film in nine years, the film bombed at the US box office, where it scored about US\$790,000 throughout its entire theatrical run.[74] Generally negative with the film, critics dismissed the film as "an overwritten, underplotted vanity project," but applauded Keaton's performance.[75][76] Ty Burr from *The Boston Globe* felt that the film "would be instantly forgettable if not for Keaton, who imbues [her role] with a sorrow, warmth, wisdom, and rage that feel earned [...] Her performance here is an extension of worn, resilient grace." [76]

Also in 2011, Keaton began production on Justin Zackham's ensemble comedy *The Big Wedding*, in which she, along with Robert De Niro, will play a long-divorced couple who, for the sake of their adopted son's wedding and his very religious biological mother, pretend they're still married.[77] In addition, Keaton has been cast in the family comedy *One Big Happy* alongside Steve Martin,[78] *The Look of Love*, an independent romance film, with Ed Harris,[79] and the romantic comedy *And So It Goes...*, a collaboration with Michael Douglas and director P. J. Hogan.[80]

[edit] Personal life

[edit] Relationships and family

Keaton had bulimia during the early 1970s.[81] Her most famous romance was with director Woody Allen. Keaton and Allen first met during her audition for the Broadway production of *Play It Again, Sam*, but they did not know each other personally until having dinner after a late night rehearsal. Allen claims that Keaton's sense of humor attracted him to her.[82] They briefly lived together during the Broadway run of *Play It Again, Sam*, but their relationship became less formal by the time the film version was produced in 1972.[83] They worked together on eight films between 1971 and 1993.

In 1979, she began dating her *Reds* co-star Warren Beatty.[84] Keaton's involvement with Beatty also made her a regular subject of tabloid magazines and media at the time, a role she was unaccustomed to. (As a result of her avoiding the spotlight, *Vanity Fair* described her in 1985 as "the most reclusive star since Garbo".)[8] Beatty and Keaton separated shortly after completing *Reds*. Their separation was believed to have been caused by the strain of making the film, a troubled production with numerous financial and scheduling problems.[28] Keaton still maintains contact with both Allen and Beatty, and describes Allen as one of her closest friends.[17]

Keaton also had a relationship with Al Pacino, her co-star in *The Godfather Trilogy*. The on-again, off-again relationship ended following the filming of *The Godfather Part III*. Referring to the relationship, Keaton has said "Al was simply the most entertaining man... To me, that's, that is the most beautiful face. I think Warren was gorgeous, very pretty, but Al's face is like whoa. Killer, killer face." [85] Pacino, who seems to have been the love of Keaton's life, never agreed to her marriage ultimatums, and their lengthy relationship ended when her father was dying of brain cancer.[84]

In July 2001, Keaton publicly announced that she had given up pursuing romance, and stated, "I don't think that because I'm not married it's made my life any less. That old maid myth is garbage." [86] Keaton has two adopted children, daughter Dexter (adopted 1996) and son Duke (2001). Keaton decided to become a mother at the age of 50 after the death of her father, when she began to realize her own mortality.[38] She later said of having children, "Motherhood has completely changed me. It's just about the most completely humbling experience that I've ever had." [87]

[edit] Religious beliefs

Keaton stated that she produced her 1987 documentary *Heaven* because, "I was always pretty religious as a kid ... I was primarily interested in religion because I wanted to go to heaven" but also stated that she considered herself an agnostic.[88]

Raised a Methodist, Keaton stated in an October 2002 television interview with *Oxygen* that although she currently believes in God, she considered herself an atheist for a period of her life.

[edit] Other activities

Keaton is an opponent of plastic surgery. She told *More* magazine in 2004, "I'm stuck in this idea that I need to be authentic ... My face needs to look the way I feel." [6] Keaton is also active in campaigns with the Los Angeles Conservancy to save and restore historic buildings, particularly in the Los Angeles area.[9] Among the buildings she has been active in restoring is the Ennis House in the Hollywood Hills designed by Frank Lloyd Wright.[23] Keaton had also been active in the failed campaign to save the Ambassador Hotel in Los Angeles (a hotel featured in *Reservations*), the location of Robert Kennedy's assassination in 1968.

Since May 2005, she has been a contributing blogger at *The Huffington Post*. Since summer 2006, Keaton has been the new face of L'OrÃ©al.[89]

Keaton has served as a producer on films and television series. She produced the Fox series *Pasadena*, that was canceled after airing only four episodes in 2001 but later completed its run on cable in 2005. In 2003, she produced the Gus Van Sant drama *Elephant*, about a school shooting. On why she produced the film, she said "It really makes me think about my responsibilities as an adult

to try and understand what's going on with young people." [90]

Outside of the film industry, Keaton has continued to pursue her interest in photography. As a collector, she told Vanity Fair in 1987: "I have amassed a huge library of images—kissing scenes from movies, pictures I like. Visual things are really key for me." [88] She has published several more collections of her own photographs, and has also served as an editor for collections of vintage photography. Works she has edited in the last decade include a book of photographs by paparazzo Ron Galella; an anthology of reproductions of clown paintings; and a collection of photos of California's Spanish-Colonial-style houses.

Keaton has also established herself as a real estate developer. She has resold several mansions in Southern California after renovating and redesigning them. One of her clients is Madonna, who purchased a US\$6.5 million Beverly Hills mansion from Keaton in 2003. [91] She received the Film Society of Lincoln Center's Gala Tribute in 2007.

Keaton wrote her first memoir, entitled *Then Again*, for Random House in November 2011. [92] Much of the autobiography relies on her mother Dorothy's private journals, in which she writes at one point: "Diane...is a mystery...At times, she's so basic, at others so wise it frightens me." [93]

[edit] Filmography

Year

Film

Role

Notes

1970

Lovers and Other Strangers

Joan Vecchio

1970

Night Gallery

Nurse Frances Nevins

(TV series)

1971

Men of Crisis: The Harvey Wallinger Story

Renata Wallinger

(TV short)

1971

F.B.I., TheThe F.B.I.

Diane Britt

(TV series)

1971

Mannix

Cindy Conrad

(TV series)

1972

Godfather Part I, TheThe Godfather

Kay Adams-Corleone

1972

Play It Again, Sam

Linda Christie

1973

Sleeper

Luna Schlosser

1974

Godfather Part II, TheThe Godfather Part II

Kay Adams-Corleone

1975

Love and Death

Sonja

1976

I Will, I Will... for Now

Katie Bingham
 1976
 Harry and Walter Go to New York
 Lissa Chestnut
 1977
 Annie Hall
 Annie Hall
 Academy Award for Best ActressBAFTA Award for Best Actress in a Leading
 RoleGolden Globe Award for Best ActressÂ ^ Motion Picture Musical or
 ComedyKansas City Film Critics Circle Award for Best ActressNational Board of
 Review Award for Best Supporting ActressNational Society of Film Critics Award
 for Best ActressNew York Film Critics Circle Award for Best Actress
 1977
 Looking for Mr. Goodbar
 Theresa Dunn
 Premios Fotogramas de PlataÂ ^ ~ Best Foreign Movie Performer
 Nominated â ~ Golden Globe Award for Best ActressÂ ^ Motion Picture Drama
 1978
 Interiors
 Renata
 Premios Fotogramas de PlataÂ ^ ~ Best Foreign Movie Performer
 1979
 Manhattan
 Mary Wilkie
 Nominated â ~ American Movie Award for Best Actress
 Nominated â ~ BAFTA Award for Best Actress in a Leading Role
 1981
 Reds
 Louise Bryant
 David di Donatello Award for Best Foreign Actress
 Nominated â ~ Academy Award for Best Actress
 Nominated â ~ BAFTA Award for Best Actress in a Leading Role
 Nominated â ~ Golden Globe Award for Best ActressÂ ^ Motion Picture Drama
 1982
 Shoot the Moon
 Faith Dunlap
 Nominated â ~ Golden Globe Award for Best ActressÂ ^ Motion Picture Drama
 1984
 Mrs. Soffel
 Kate Soffel
 Nominated â ~ Golden Globe Award for Best ActressÂ ^ Motion Picture Drama
 1984
 Little Drummer Girl, TheThe Little Drummer Girl
 Charlie
 1986
 Crimes of the Heart
 Lenny Magrath
 1987
 Radio Days
 New Year's singer
 Cameo
 1987
 Baby Boom
 J.C. Wiatt
 Nominated â ~ Golden Globe Award for Best ActressÂ ^ Motion Picture Musical or
 Comedy
 1987
 Heaven
 Documentary film; also writer/director
 1988

Good Mother, TheThe Good Mother
 Anna Dunlap
 1989
 Lemon Sisters, TheThe Lemon Sisters
 Eloise Hamer
 1990
 Godfather Part III, TheThe Godfather Part III
 Kay Adams
 1991
 Father of the Bride
 Nina Banks
 1992
 Running Mate
 Aggie Snow
 Television film
 1993
 Manhattan Murder Mystery
 Carol Lipton
 Nominated â ~ Golden Globe Award for Best ActressÂ â ^ Motion Picture Musical or
 Comedy
 1993
 Look Who's Talking Now
 Daphne
 Voice role
 1994
 Amelia Earhart: The Final Flight
 Amelia Earhart
 Television film
 Nominated â ~ Primetime Emmy Award for Outstanding Lead ActressÂ â ^ Miniseries or a
 Movie
 Nominated â ~ Golden Globe Award for Best Performance by an Actress In A
 Mini-series or Motion Picture Made for Television
 1995
 Father of the Bride Part II
 Nina Banks
 1996
 First Wives Club, TheThe First Wives Club
 Annie Paradis
 Golden Apple Award (shared with Bette Midler and Goldie Hawn)National Board of
 Review Award for Best Cast
 1996
 Marvin's Room
 Bessie Greenfield
 Nominated â ~ Academy Award for Best Actress
 Nominated â ~ Screen Actors Guild Award for Outstanding Performance by a Female
 Actor in a Leading RoleÂ â ^ Motion Picture
 Nominated â ~ Screen Actors Guild Award for Outstanding Performance by a Cast in
 a Motion Picture
 1997
 Only Thrill, TheThe Only Thrill
 Carol Fitzsimmons
 1997
 Northern Lights
 Roberta Blumstein
 (TV film)
 1999
 Other Sister, TheThe Other Sister
 Elizabeth Tate
 2000
 Hanging Up

Georgia Mozell
 Also director
 2001
 Town & Country
 Ellie Stoddard
 2001
 Sister Mary Explains It All
 Sister Mary Ignatius
 Television film
 2001
 Plan B
 Fran Varrechio
 Television film
 2002
 Crossed Over
 Beverly Lowry
 Television film
 2003
 On Thin Ice
 Patsy McCarthle
 Television film
 2003
 Something's Gotta Give
 Erica Barry
 Golden Globe Award for Best Actress
 ^ Motion Picture Musical or Comedy
 Iowa Film Critics Award for Best Actress
 National Board of Review Award for Best Actress
 Satellite Award for Best Actress
 ^ Motion Picture Musical or Comedy
 Nominated ~ Academy Award for Best Actress
 Nominated ~ Broadcast Film Critics Association Award for Best Actress
 Nominated ~ Phoenix Film Critics Society Award for Best Performance by an Actress in a Leading Role
 Nominated ~ Screen Actors Guild Award for Outstanding Performance by a Female Actor in a Leading Role
 Nominated ~ Washington D.C. Area Film Critics Association Award for Best Actress
 2003
 Elephant
 Executive producer
 2005
 Family Stone, The
 The Family Stone
 Sybil Stone
 Nominated ~ Satellite Award for Best Supporting Actress
 ^ Motion Picture
 2006
 Surrender, Dorothy
 Natalie Swerdlow
 Television film
 2007
 Because I Said So
 Daphne Wilder
 Nominated ~ Golden Raspberry Award for Worst Actress
 2007
 Mama's Boy
 Jan Mannus
 2008
 Mad Money
 Bridget Cardigan
 2008
 Smother
 Marilyn Cooper
 2010
 Morning Glory

Colleen Peck
2012
Darling Companion
Beth Winter
2013
The Big Wedding
Ellie Griffin
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[edit] Further reading

[edit] External links

Persondata

Name

Keaton, Diane

Alternative names

Hall, Diane

Short description

Actor

Date of birth

January 5, 1946

Place of birth

Los Angeles, California

Date of death

Place of death

The Icelandic Phallogological Museum (Icelandic: *Hiflenskið Reinasafn*), located in Reykjavík, Iceland, houses the world's largest display of penises and penile parts. The collection of 280 specimens from 93 species of animals includes 55 penises taken from whales, 36 from seals and 118 from land mammals, allegedly including *Huldufólk* (Icelandic elves) and trolls. In July 2011, the museum obtained its first human penis, one of four promised by would-be donors. Its detachment from the donor's body did not go according to plan and it was reduced to a greyish-brown shrivelled mass pickled in a jar of formaldehyde. The museum continues to search for "a younger and a bigger and better one." [2]

Founded in 1997 by retired teacher Sigurður Hjartarson and run by his son Hjartur Gísli Sigurðsson, the museum grew out of an interest in penises that began during Sigurður's childhood when he was given a cattle whip made from a bull's penis. He obtained the organs of Icelandic animals from sources around the country, with acquisitions ranging from the 170 cm (67 in) front tip of a blue whale's penis to the 2 mm (0.08 in) penis bone of a hamster, which can only be seen with a magnifying glass. The museum claims that its collection includes the penises of elves and trolls, though, as Icelandic folklore portrays such creatures as being invisible, they cannot be seen. The collection also features phallic art and crafts such as lampshades made from the scrotums of bulls.

The museum has become a popular tourist attraction with thousands of visitors a year – the majority of them women [3] – and has received international media attention, including a Canadian documentary film called *The Final Member*, which covers the museum's quest to obtain a human penis. According to its mission

statement, the museum aims to enable "individuals to undertake serious study into the field of phallology in an organized, scientific fashion." [4]

[edit] History

The museum's founder Sigurður Hjartarson worked as a teacher and principal for 37 years, teaching history and Spanish at Reykjavík's Hamrahlíð College before his retirement. [5] As a child, he owned a bull's penis (or pizzles) which was given to him to use as a cattle whip. He began collecting penises after a friend heard the story of the bull's penis in 1974 and gave him four new ones, three of which Sigurður gave to friends. Acquaintances at whaling stations began bringing him whale penises as well, and the collection grew from there, expanding through donations and acquisitions from various sources around Iceland. [6]

The organs of farm animals came from abattoirs, while fishermen supplied those of seals and the smaller whales. The penises of larger whales came from commercial whaling stations, although this source dried up after the International Whaling Commission implemented a global ban on commercial whaling in 1986. Sigurður was able to continue to collect whale penises by harvesting them from the 12–16 whales that fall victim to stranding on the Icelandic coast each year. [6] He also obtained the penis of a polar bear shot by fishermen who found the animal drifting on pack ice off the Westfjords. [2] He was assisted by his family, though not without some occasional embarrassment. His daughter Þorgerður recalls that she was once sent to a slaughterhouse to collect a specimen but arrived just as the workers were taking a lunch break: "Someone asked, 'What's in the basket?' I had to say, 'I'm collecting a frozen goat penis.' After that I said, 'I will never collect for you again.'" [7] According to Sigurður, "Collecting penises is like collecting anything. You can never stop, you can never catch up, you can always get a new one, a better one." [8]

The collection was at first housed in Sigurður's office at the college until he retired from his teaching job. He decided, more as a hobby than a job, to put it on public display in Reykjavík and was awarded a grant from the city council of ISK 200,000 to support the opening of a museum in August 1997. [9] By 2003, it was attracting 5,200 visitors a year, of which 4,200 were from abroad. He put the museum up for sale in 2003, but also offered it to the city of Reykjavík as a gift. [10] However, he was unsuccessful in obtaining financial support from the state or city. When he retired in 2004, he could no longer afford the rent on the museum's premises. [11]

After his retirement, he moved along with his collection to Hósvík, a fishing village with a population of about 2,200 people located 298 miles (480 km) northeast of the capital. The museum was housed in a small building, formerly a restaurant, [11] that was marked with a giant wooden penis and a stone phallus standing outside on the street. The village's inhabitants were at first skeptical of the new arrival, but came to accept it when they were persuaded that there was nothing pornographic about the museum. [2]

In 2012 he handed over the collection to his son, Hjartur Gísli Sigurðsson (described by Slate as "the world's only hereditary penis-museum operator" [7]). It was relocated from Hósvík to Reykjavík's main shopping street at Laugavegur 116. [12] An offer from a wealthy German to buy the museum for ISK 30 million (US \$232,000 / £186,000) and a proposal to move it to the United Kingdom were both turned down, as Hjartur insists that "the museum has to be in Iceland." [13] He intends to continue acquiring new penises because you can "always get a better, newer one ... a bigger size or better shape, you know?" [14]

Sigurður has described the collection as the product of "37 years of collecting penises. Somebody had to do it." [8] According to University of Iceland anthropologist Sigurjón Baldur Hafsteinsson, Icelanders' tolerance of the museum is an indicator of how Icelandic society has changed since the 1990s, when a newly elected neoliberal government fostered a more open outlook on entertainment, creativity and tourism that has "enabled new ideas to emerge publicly". [8] He has documented the significance of the museum's role in Icelandic culture in a forthcoming book, *Icelandick: The Phallological Museum*

and Neo-liberal Politics.[15]

[edit] Collection

According to the museum's website, the collection comprises 280 specimens from 93 species of animals. They range from some of the largest to some of the smallest penises in the animal world. Its largest exhibit is a portion of a blue whale's penis measuring 170 cm (67 in) long and weighing 70 kilograms (150 lb),[3] which Iceland Review has dubbed "a real Moby Dick".[16] The specimen is only the front tip as the entire organ, when intact, would have been about 5 m (16 ft) long and weighed about 350–450 kilograms (770–990 lb). The penis bone of a hamster, only 2 mm (0.08 in) long, is the smallest item in the collection and needs a magnifying glass to view it.[3]

The museum also has a "folklore section" exhibiting mythological penises; its online catalogue lists specimens taken from elves, trolls, kelpies, and "The Nasty Ghost of Snæfell".[17] Sigurður says that the elf's penis, which the museum's catalogue describes as "unusually big and old", is among his favourites. It cannot be seen, as Icelandic folklore holds that elves and trolls are invisible.[11] The folkloric penises also include those of a merman, a one-legged, one-armed and one-eyed monster called a Beach-Murmurer, an Enriching Beach Mouse (said to draw "money from the sea to enrich her owner"), and an Icelandic Christmas Lad found dead at the foot of a mountain in 1985 and whose penis was presented to the museum by a former mayor of Reykjavík.[17]

The museum's website states that it enables "individuals to undertake serious study into the field of phallogology in an organized, scientific fashion", giving due prominence to a field that until now has only been "a borderline field of study in other academic disciplines such as history, art, psychology, literature and other artistic fields like music and ballet." [17] The museum aims to collect penis specimens from every mammal in Iceland. It also exhibits phallic artwork and penis-related objects or "phallobilia" such as lampshades made from the scrotums of bulls.[4] Other exhibits range "from an 18th-century engraving depicting the circumcision of Christ to a 20th-century plastic penis pacifier." [16] Most of the collection has been donated, and the only purchase to date has been an elephant's penis measuring nearly 1 m (3.3 ft) long. The penises are either preserved in formaldehyde and displayed in jars or are dried and hung or mounted on the walls of the museum.[3]

Sigurður has used a variety of techniques to preserve the penises, including preservation in formaldehyde, pickling, drying, stuffing and salting.[18] One particularly large penis taken from a bull has been converted into a walking stick.[8] Many of the museum's exhibits are illuminated by lamps made by Sigurður from rams' testicles.[18] Sigurður has also carved wooden phalluses, which can be found adorning various objects around the museum,[2] and has a bow tie decorated with images of phalluses that he wears on special occasions.[11]

Josh Schonwald of Salon.com described his impressions of the museum when he visited in 1998:

They were hanging on the walls, stuffed in jars, displayed with curatorial love—dried penises, penises embalmed in formaldehyde, massive penises displayed like hunting trophies. A tanned bull's penis, a smoked horse's penis. There were runty, shriveled penises of reindeer, foxes, minks and rats. There were seal and walrus penises with stiff penis bones—ensuring a perpetually erect state. There was the Big Penis—a 3-foot-long blue whale penis (which could have been an oar for a canoe).[6]

The museum is open every day[19] and by July 2011 was attracting up to 11,000 visitors annually.[2] Sixty percent of the museum's visitors are reported to be women,[3] though according to the authors of the Rough Guide to Iceland, mentioning the museum "causes the staff at the tourist office to blush with embarrassment." [20] The museum's guest book includes comments such as, "I've never seen so many penises—and I went to boarding school!" (from a New Zealand visitor), "They're bigger in the USA," (from someone from Wisconsin) and "Is there a vagina museum?" [7] (On this point, Sigurður has said, "I'm only

collecting the male organ. Somebody else has to do the other job. I'd be interested in how they would preserve it. I think vaginas are better alive." [21])

[edit] Human penis

For many years, the museum sought to obtain a human penis. Sigurður was able to obtain human testicles and a foreskin from two separate donors; [22] the foreskin was donated by Iceland's National Hospital after an emergency circumcision operation. [20] The museum also contains sculptures of 15 penises based on the Iceland national handball team. As the team had won the silver medal at the 2008 Beijing Olympic Games, the penises were made from a silvered material. Sigurður claims that although they are not displayed in the same order as the individuals shown in the photograph that accompanies them, "their wives would recognise them." [2] According to Slate, these sculptures were created by Sigurður's daughter, Þórunn Sigurðardóttir, and were based on her own experience rather than any knowledge of the team. The team's goalkeeper denies that the sculptures are casts. [7]

The museum has so far received pledges from four men: an Icelandic, a German, an American and a Briton to donate their penises. Canadian film-maker Zach Math comments that the American "is an ordinary guy but he has this quirk where he thinks of his penis as a separate entity from his body" Elmo. He has this dream that he wants it to be the most famous penis in the world." [23] According to Sigurður, the American donor "wanted to have his penis cut off even during his lifetime and then visit the museum." [11] The American sent a cast of his penis to serve as a substitute in the meantime, [3] along with photographs of it dressed up as Santa Claus and Abraham Lincoln. [24] The donor also tattooed his penis with the Stars and Stripes to make it more attractive. [23]

The Icelandic donor was a 95-year-old man from nearby Akureyri who was said to have been a womaniser in his youth and wanted to donate his penis to the museum to ensure his "eternal fame". [3] Sigurður said that, even at the age of 95, the donor remained active, "both vertically and horizontally". [6] However, the donor was said to be concerned that "his penis is shrinking as he gets older and he is worried it might not make a proper exhibit." [3] His penis was given priority over those of the non-Icelandic donors in accordance with the museum's mission to display the organs of Icelandic mammals. Removing and preserving it was not an easy proposition, as Sigurður explained: "The donor and the doctors are in agreement, it must be taken while the body is warm. Then bleed it and pump it up. If it cools you can't do anything, so [the donor] is eager to have it taken warm and treated to be preserved with dignity." [18]

In January 2011, the Icelandic donor died and his penis was surgically removed so that it could be added to the museum's collection. The penectomy was not entirely successful and left the penis "a greyish-brown, shrivelled mass". According to Sigurður, "I should have stretched it and sewn it at the back to keep it in more or less a normal position". Instead, it "went directly into the formaldehyde". Although disappointed with the results, Sigurður expressed confidence that "I will get a younger and a bigger and better one soon." [2] Visitors' most common reaction to the preserved human penis is "that it's very old, you know, a bit shrunken, and the male members [sic] say 'oh, I hope mine will not look like this when I get old.'" [14] Sigurður has considered donating his own penis to the museum when he dies but said that it depends on his wife: "If she dies first, my specimen would go in here. If I die first, well I can't say. She might say no." [2]

The museum is the subject of *The Final Member*, a film by Canadian documentarians Zach Math and Jonah Bekhor. It profiles Sigurður and his quest to obtain a human penis for the museum, telling the story of the American and Icelandic donors and examining the quasi-taboo nature of the museum's collection. Bekhor says: "I wouldn't say it's a Rorschach test, but depending on how you react to it really says a lot about what your relationship is with that element of the human anatomy. It's a really interesting phenomenon and we're really curious to see how audiences respond." The film premiered on 1 May 2012 at the Hot Docs Canadian International Documentary Festival. [25]

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[edit] External links

"We Are the World" is a song and charity single originally recorded by the supergroup USA for Africa in 1985. It was written by Michael Jackson and Lionel Richie, and produced by Quincy Jones and Michael Omartian for the album We Are the World. With sales in excess of 20 million copies, it is one of the fewer than 30 all-time singles to have sold 10 million (or more) copies worldwide.

Following Band Aid's "Do They Know It's Christmas?" project in the UK, an idea for the creation of an American benefit single for African famine relief came from activist Harry Belafonte, who, along with fundraiser Ken Kragen, was instrumental in bringing the vision to reality. Several musicians were contacted by the pair, before Jackson and Richie were assigned the task of writing the song. Following several months of working together, the duo completed the writing of "We Are the World" one night before the song's first recording session, in early 1985. The last recording session for the song was held on January 28, 1985. The historic event brought together some of the most famous artists in the music industry at the time.

The song was released on March 7, 1985, as the only single from the album. A worldwide commercial success, it topped music charts throughout the world and became the fastest-selling American pop single in history. The first ever single to be certified multi-platinum, "We Are the World" received a Quadruple Platinum certification by the Recording Industry Association of America. However, the song garnered mixed reviews from journalists, music critics, and the public. Fans enjoyed hearing racially and musically diverse recording artists singing together on one track, and felt satisfied in buying "We Are the World", knowing that the money was going to charity. Other individuals, including many commentators in the rock press, were disappointed that the song did not challenge listeners as to why famines occur in the first place, and felt that the lyrics were self-aggrandizing.

Awarded numerous honorsâ ~including three Grammy Awards, one American Music Award, and a People's Choice Awardâ ~the song was promoted with a critically received music video, a home video, a special edition magazine, a simulcast, and several books, posters, and shirts. The promotion and merchandise aided the success of "We Are the World" and raised over \$63Â million for humanitarian aid in Africa and the US.

Following the devastation caused by the magnitude 7.0 Mw earthquake in Haiti on January 12, 2010, a remake of the song by another all-star cast of singers was recorded on February 1, 2010. Entitled "We Are the World 25 for Haiti", it was released as a single on February 12, 2010, and proceeds from the record aided survivors in the impoverished country.

[edit] Background and writing

Before the writing of "We Are the World", American entertainer and social activist Harry Belafonte had sought for some time to have a song recorded by the most famous artists in the music industry at the time. He planned to have the proceeds donated to a new organization called United Support of Artists for Africa (USA for Africa). The non-profit foundation would then feed and relieve starving people in Africa, specifically Ethiopia, where around one million people died during the country's 1984â ~1985 famine.[1][2] The idea followed Band Aid's "Do They Know It's Christmas" project in the UK, which Belafonte had heard about.[nb 1][4] In the activist's plans, money would also be set aside to help eliminate hunger in the United States of America. Entertainment manager and fellow fundraiser Ken Kragen was contacted by Belafonte, who asked for singers Lionel Richie and Kenny Rogersâ ~Kragen's clientsâ ~to participate in Belafonte's musical endeavor. Kragen and the two musicians agreed to help with Belafonte's mission, and in turn, enlisted the cooperation of Stevie Wonder, to add more "name value" to their project.[1]Quincy Jones was drafted to co-produce the song, taking time out from his work on The Color Purple.[1][5] Richie also telephoned Michael Jackson, who had just released the commercially successful Thriller album and had concluded a tour with his brothers.[1]

Jackson revealed to Richie that he not only wanted to sing the song, but to participate in its writing as well.[1][6] To begin with, "We Are the World" was to be written by Jackson, Richie, and Wonder. As Wonder had limited time to work on the project, Jackson and Richie proceeded to write "We Are the World" themselves.[6] They began creating the song at Hayvenhurst, the Jackson family home in Encino. For a week, the two spent every night working on lyrics and melodies in the singer's bedroom. They knew that they wanted a song that would be easy to sing and memorable. The pair wanted to create an anthem. Jackson's older sister LaÂ Toya watched the two work on the song, and later contended that Richie only wrote a few lines for the track.[5] She stated that her younger brother wrote 99Â percent of the lyrics, "but he's never felt it necessary to say that".[5] LaÂ Toya further commented on the song's creation in an interview with the American celebrity news magazine People. "I'd go into the room while they were writing and it would be very quiet, which is odd, since Michael's usually very cheery when he works. It was very emotional for them." [6]

Richie had recorded two melodies for "We Are the World", which Jackson took, adding music and words to the song in the same day. Jackson stated, "I love working quickly. I went ahead without even Lionel knowing, I couldn't wait. I went in and came out the same night with the song completedâ ~drums, piano, strings, and words to the chorus." [7] Jackson then presented his demo to Richie and Jones, who were both shocked; they did not expect the pop star to see the structure of the song so quickly. The next meetings between Jackson and Richie were unfruitful; the pair did not produce any additional vocals and got no work done. It was not until the night of January 21, 1985, that Richie and Jackson completed the lyrics and melody of "We Are the World" within two and a half hours, one night before the song's first recording session.[7]

[edit] Recording sessions

The first night of recording, January 22, 1985, had tight security on hand, as Richie, Jackson, Wonder, and Jones started work on "We Are the World" at Kenny Rogers' Lion Share Recording Studio. The studio, on Beverly Boulevard in

California, was filled with musicians, technicians, video crews, retinues, assistants, and organizers as the four musicians entered. To begin the night, a "vocal guide" of "We Are the World" was recorded by Richie and Jackson and duplicated on tape for each of the invited performers. The guide was recorded on the sixth take, as Quincy Jones felt that there was too much "thought" in the previous versions.[8]

Following their work on the vocal guide, Jackson and Jones began thinking of alternatives for the line "There's a chance we're taking, we're taking our own lives": the pair was concerned that the latter part of the line would be considered a reference to suicide. As the group listened to a playback of the chorus, Richie declared that the last part of the line should be changed to "We're 'saving' our own lives", which his fellow musicians agreed with. Producer Jones also suggested altering the former part of the line. "One thing we don't want to do, especially with this group, is look like we're patting ourselves on the back. So it's really, 'There's a choice we're making.'"[9] Around 1:30Â am, the four musicians ended the night by finishing a chorus of melodic vocalizations, including the sound "sha-lum sha-lin-gay".[9] Jones told the group that they were not to add anything else to the tape. "If we get too good, someone's gonna start playing it on the radio," he announced.[9]

On January 24, 1985, after a day of rest, Jones shipped Richie and Jackson's vocal guide to all of the artists who would be involved in "We Are the World"'s recording. Enclosed in the package was a letter from Jones, addressed to "My Fellow Artists":[9]

The cassettes are numbered, and I can't express how important it is not to let this material out of your hands. Please do not make copies, and return this cassette the night of the 28th. In the years to come, when your children ask, 'What did mommy and daddy do for the war against world famine?', you can say proudly, this was your contribution.[9]

Ken Kragen chaired a production meeting at a bungalow off Sunset Boulevard on January 25, 1985. There, Kragen and his team discussed where the recording sessions with the supergroup of musicians should take place. He stated, "The single most damaging piece of information is where we're doing this. If that shows up anywhere, we've got a chaotic situation that could totally destroy the project. The moment a Prince, a Michael Jackson, a Bob Dylanâ ~I guarantee you!â ~drives up and sees a mob around that studio, he will never come in."[9] On the same night, Quincy Jones' associate producer and vocal arranger, Tom Bahler, was given the task of matching each solo line with the right voice. Bahler stated, "It's like vocal arranging in a perfect world."[9] Jones disagreed, stating that the task was like "putting a watermelon in a Coke bottle".[9] The following evening, Lionel Richie held a "choreography" session at his home, where it was decided who would stand where.[9]

The final night of recording was held on January 28, 1985, at A&M Recording Studios in Hollywood.[3][9] Michael Jackson arrived at 9Â pm, earlier than the other artists, to record his solo section and record a vocal chorus by himself.[9] He was subsequently joined in the recording studio by the remaining USA for Africa artists, which included Ray Charles, Billy Joel, Diana Ross, Cyndi Lauper, Bruce Springsteen and Smokey Robinson. Also in attendance were five of Jackson's siblings: Jackie, LaÂ Toya, Marlon, Randy and Tito.[10] Many of the participants came straight from an American Music Award ceremony, which had been held that same night.[5] Invited musician Prince, who would have had a part in which he and Michael Jackson sang to each other, did not attend the recording session.[11] The reason given for his absence has varied. One newspaper claimed that the singer did not want to record with other acts.[12] Another report, from the time of "We Are the World"'s recording, suggested that the musician did not want to partake in the session because organizer Bob Geldof called him a "creep".[13] Prince did, however, donate an exclusive track, "4 The Tears In Your Eyes", for the We Are the World album.[12] In all, more than 45 of America's top musicians participated in the recording, and

another 50 had to be turned away.[11][14] Upon entering the recording studio, the musicians were greeted by a sign pinned to the door which read, "Please check your egos at the door." [15] They were also greeted by Stevie Wonder, who proclaimed that if the recording was not completed in one take, he and Ray Charles, two blind men, would drive everybody home.[16]

I think what's happening in Africa is a crime of historic proportions. . . . You walk into one of the corrugated iron huts and you see meningitis and malaria and typhoid buzzing around the air. And you see dead bodies lying side by side with the live ones. In some of the camps you see 15 bags of flour for 27,000 people. And I assume that's why we're all here tonight.

Bob Geldof, addressing his fellow USA for Africa musicians during one of the recording sessions of "We Are the World" on January 28, 1985.[17]

Each of the performers took his or her position at around 10:30 pm and began to sing. Several hours passed before Stevie Wonder announced that he would like to substitute the "sha-lum sha-lin-gay" sound for a line in Swahili.[17][18] At this point, Waylon Jennings left the recording studio and never returned; he allegedly felt that no "good ole boy" ever sang in Swahili.[17][18] A heated debate ensued, in which several artists rejected the suggestion. The "sha-lum sha-lin-gay" sound ran into opposition as well and was subsequently removed from the song. The participants eventually decided to sing something meaningful in English. They chose to sing the new line "One world, Our children", which most of the participants enjoyed.[17]

In the early hours of the morning, two Ethiopian women, guests of Stevie Wonder, were brought into the recording studio. It had been decided that a portion of the proceeds raised would be used to bring aid to those affected by the recent famine in Ethiopia.[18][19] They thanked the singers on behalf of their country, bringing several artists to tears, before being led from the room.[18][19] Wonder attempted to lighten the mood, by joking that the recording session gave him a chance to "see" fellow blind musician Ray Charles. "We just sort of bumped into each other!" [16] The solo parts of the song were recorded without any problems.[19] The final version of "We Are the World" was completed at 8 am.[19][20]

In October 1984, Ken Kragen and his production executive Ken Yates approached Howard G. Malley and Craig B. Golin and asked if they could produce a video for Famine in Africa for \$200,000. Kenny Rogers and Lionel Richie (both Kragen clients) were going to put up the money for the project. Rogers donated his Lionshare Recording Studios for the pre/post audio recording sessions.

Malley and Golin told Kragen that they would get everything donated; technical and lighting labor; video equipment; lighting equipment; projection screens to put in the Charlie Chaplin Stage at A&M to hold the various entourages and to keep the studio free to make the recording. They asked April Lee Grebb to be the Production Supervisor and she readily agreed. Everything was donated and not one penny was spent on the video. Additionally Kragen asked Malley and Golin to produce a 1 Hour HBO Special and a 30 Minute Home Video. Kragen arranged for Jane Fonda to host the shows. Michael Jackson later recorded a solo version of the song.[citation needed]

This project took four months from start to finish. All of the editing, sound recording, and graphics were supplied at no cost.[citation needed]

[edit] Music and vocal arrangements

"We Are the World" is sung from a first person viewpoint, allowing the audience to "internalize" the message by singing the word we together.[21] It has been described as "an appeal to human compassion".[22] The first lines in the song's repetitive chorus proclaim, "We are the world, we are the children, we are the ones who make a brighter day, so let's start giving".[22] "We Are

the World" opens with Lionel Richie, Stevie Wonder, Paul Simon, Kenny Rogers, James Ingram, Tina Turner and Billy Joel singing the first verse.[23] Michael Jackson and Diana Ross follow, completing the first chorus together.[23]Dionne Warwick, Willie Nelson and Al Jarreau sing the second verse, before Bruce Springsteen, Kenny Loggins, Steve Perry and Daryl Hall go through the second chorus.[23] Co-writer Jackson, Huey Lewis, Cyndi Lauper and Kim Carnes follow with the song's bridge.[23] This structuring of the song is said to "create a sense of continuous surprise and emotional buildup".[3] "We Are the World" concludes with Bob Dylan and Ray Charles singing a full chorus, Wonder and Springsteen duetting, and ad libs from Charles and Ingram.[23]

[edit] USA for Africa musicians
Conductor

[edit] Release and reception

On March 8, 1985, "We Are the World" was released as a single, in both 7" and 12" format.[24][25] The song was the only one released from the We Are the World album and became a chart success around the world. In the US, it was a number one hit on the R&B singles chart, the Hot Adult Contemporary Tracks chart and the Billboard Hot 100, where it remained for a month.[26][27] The single had initially debuted at number 21 on the Hot 100, the highest entry since Michael Jackson's "Thriller" entered the charts at number 20 the year before.[22] It took four weeks for the song to claim the number one spotâ ~half the time a single would normally have taken to reach its charting peak.[28] On the Hot 100, the song moved from 21 to 5 to 2 and then number 1. "We Are the World" might have reached the top of the Hot 100 chart sooner, if it were not for the success of Phil Collins' "One More Night", which received a significant level of support from both pop and rock listeners.[28] "We Are the World" also entered Billboard's Top Rock Tracks and Hot Country Singles charts, where it peaked at numbers 27 and 76 respectively.[26] The song became the first single since The Beatles' "Let It Be" to enter Billboard's Top 5 within two weeks of release.[25] Outside of the US, the single reached number one in Australia, France, Ireland, Italy, New Zealand, The Netherlands, Norway, Sweden, Switzerland and the UK. The song peaked at number 2 in Austria.[29][30][31][32]

The single was also a commercial success; the initial shipment of 800,000 "We Are the World" records sold out within three days of release.[24] The record became the fastest-selling American pop single in history.[33] At one Tower Records store on Sunset Boulevard in West Hollywood, 1,000Â copies of the song were sold in two days.[34] Store worker Richard Petitpas commented, "A number one single sells about 100 to 125Â copies a week. This is absolutely unheard of." [34] By the end of 1985, "We Are the World" had become the best selling single of the year.[35] Five years later it was revealed that the song had become the biggest single of the 1980s.[36] "We Are the World" was eventually cited as the biggest selling single in both US and pop music history.[nb 2][38][39][40] The song became the first ever single to be certified multi-platinum; it received a 4Â certification by the Recording Industry Association of America.[27][41] The estimated global sales of "We Are the World" are said to be 20Â million.[42]

Following its release, "We Are the World" received mixed reviews from journalists, music critics and the public. American journalist Greil Marcus felt that the song sounded like a Pepsi jingle.[43] He wrote, "... the constant repetition of 'There's a choice we're making' conflates with Pepsi's trademarked 'The choice of a new generation' in a way that, on the part of Pepsi-contracted song writers Michael Jackson and Lionel Richie, is certainly not intentional, and even more certainly beyond the realm of serendipity." [43] Marcus added, "In the realm of contextualization, 'We Are the World' says less about Ethiopia than it does about Pepsiâ ~and the true result will likely be less that certain Ethiopian individuals will live, or anyway live a bit longer than they otherwise would have, than that Pepsi will get the catch phrase of its advertising campaign sung for free by Ray Charles, Stevie Wonder, Bruce Springsteen, and all the rest." [43] Author Reebee Garofalo agreed, and

expressed the opinion that the line "We're saving our own lives" was a "distasteful element of self-indulgence".[43] He asserted that the artists of USA for Africa were proclaiming "their own salvation for singing about an issue they will never experience on behalf of a people most of them will never encounter".[43]

In contrast, Stephen Holden of The New York Times praised the phrase "There's a choice we're making, We're saving our own lives".[3] He commented that the line assumed "an extra emotional dimension when sung by people with superstar mystiques".[3] Holden expressed that the song was "an artistic triumph that transcends its official nature".[3] He noted that unlike Band Aid's "Do They Know It's Christmas", the vocals on "We Are the World" were "artfully interwoven" and emphasized the individuality of each singer.[3] Holden concluded that "We Are the World" was "a simple, eloquent ballad" and a "fully-realized pop statement that would sound outstanding even if it weren't recorded by stars".[3]

The song proved popular with both young and old listeners.[22] The public enjoyed hearing a supergroup of musicians singing together on one track, and felt satisfied in buying the record, knowing that the money would go towards a good cause.[22] People reported they bought more than one copy of the single, some buying up to five copies of the record.[44] One mother from Columbia, Missouri purchased two copies of "We Are the World", stating, "The record is excellent whether it's for a cause or not. It's fun trying to identify the different artists. It was a good feeling knowing that I was helping someone in need." [22]

According to music critic and Bruce Springsteen biographer Dave Marsh, "We Are the World" was not widely accepted within the rock music community.[45] The author revealed that the song was "despised" for what it was not: "a rock record, a critique of the political policies that created the famine, a way of finding out how and why famines occur, an all-inclusive representation of the entire worldwide spectrum of post-Presley popular music".[45] Marsh revealed that he felt some of the criticisms were right, while others were silly.[45] He claimed that despite the sentimentality of the song, "We Are the World" was a large-scale pop event with serious political overtones.[45]

"We Are the World" was recognized with several awards following its release. At the 1986 Grammy Awards, the song and its accompanying music video won four awards: Record of the Year, Song of the Year, Best Pop Performance by a Duo or Group with Vocal and Best Music Video, Short Form.[46] The music video was awarded two honors at the 1985 MTV Video Music Awards. It collected the awards for Best Group Video and Viewer's Choice.[47][48] People's Choice Awards recognized "We Are the World" with the Favorite New Song award in 1986.[46] In the same year, the American Music Awards named "We Are the World" "Song of the Year", and honored organizer Harry Belafonte with the Award of Appreciation. Collecting his award, Belafonte thanked Ken Kragen, Quincy Jones, and "the two artists who, without their great gift would not have inspired us in quite the same way as we were inspired, Mr. Lionel Richie and Mr. Michael Jackson".[46] Following the speech, the majority of USA for Africa reunited on stage, closing the ceremony with "We Are the World".[46][49]

[edit] Track listing

Vinyl Single:

"We Are the World" â ^ 7:09

VHS Video Event 1:

"We Are the World" â ^ 7:09

"Dancin' in the Street"

VHS Video Event Special Edition:

"MusicVision Logo/We Are the World" â ^ 7:27

"We Are the World: Behind the Scenes"

"Michael Jackson's We Are the World Demo at the Studio"

[edit] Marketing and promotion

"We Are the World" was promoted with a music video, a video cassette, and several other items made available to the public, including books, posters,

shirts and buttons.[50][51] All proceeds from the sale of official USA for Africa merchandise went directly to the famine relief fund. All of the merchandise sold well; the video cassetteâentitled We Are the World: The Video Eventâdocumented the making of the song, and became the ninth best-selling home video of 1985.[50] All of the video elements were produced by Howard G. Malley and Craig B. Golin along with April Lee Grebb as the production supervisor.

The music video showed the recording of "We Are the World", and drew criticism from some. Michael Jackson joked before filming, "People will know it's me as soon as they see the socks. Try taking footage of Bruce Springsteen's socks and see if anyone knows who they belong to." [24] Jackson was also criticized for filming and recording his solo piece privately, away from the other artists. The singer's supporters reasoned that Jackson was a perfectionist; recording in front of other big name artists would leave him awestruck and unable to perform at his best. He was also known for his shy nature, and the idea of singing solo in front of 44 other famous artists probably sounded terrifying to him.

The song was also promoted with a special edition of the American magazine Life. The publication had been the only media outlet permitted inside A&M Recording Studios on the night of January 28, 1985. All other press organizations were barred from reporting the events leading up to and during "We Are the World"'s recording. Life ran a cover story of the recording session in its April 1985 edition of the monthly magazine. Seven members of USA for Africa were pictured on the cover: Bob Dylan, Bruce Springsteen, Cyndi Lauper, Lionel Richie, Michael Jackson, Tina Turner and Willie Nelson. Inside the magazine were photographs of the "We Are the World" participants working and taking breaks.[50]

On the morning of April 5, 1985 (Good Friday of that year), "We Are the World" received worldwide coverage. At 10:25Âam, over 8000 radio stations simultaneously broadcast the song around the world. They played it to show their support for the relief of famine in Ethiopia.[27] The song was also broadcast by Muzak, a company which pipes background music into 110,000 stores and businesses in the US. It was the second time Muzak had played the sound of "human voice", the first being an announcement on the release of American hostages in Iran in 1981.[52] As the song was broadcast, hundreds of people sang along on the steps of St. Patrick's Cathedral in New York.[44][53] The simultaneous radio broadcast of "We Are the World" was repeated again the following Good Friday.[27]

"We Are the World" gained further promotion and coverage on May 25, 1986, when it was played during a major benefit event held throughout the US.[54][55] Hands Across AmericaâUSA for Africa's follow-up projectâwas an event in which millions of people formed a human chain across the US.[56] The event was held to draw attention to hunger and homelessness in the United States.[57] "We Are the World"'s co-writer, Michael Jackson, had wanted his song to be the official theme for the event. The other board members of USA for Africa outvoted the singer, and it was instead decided that a new song would be created and released for the event, titled "Hands Across America".[46] When released, the new song did not achieve the level of success that "We Are the World" did, and the decision to use it as the official theme for the event led to Jacksonâwho co-owned the publishing rights to "We Are the World"âresigning from the board of directors of USA for Africa.[46][58]

[edit] Humanitarian aid

Four months after the release of "We Are the World", USA for Africa had taken in almost \$10.8Âmillion.[59][60] The majority of the money came from record sales within the US.[59][60] Members of the public also donated moneyâalmost \$1.3Âmillion within the same time period. In May 1985, USA for Africa officials estimated that they had sold between \$45Âmillion and \$47Âmillion worth of official merchandise around the world. Organizer Ken Kragen announced that they would not be distributing all of the money at once. Instead, he revealed that the foundation would be looking into finding a long-term solution for Africa's problems.[59] "We could go out and spend it all in one shot. Maybe we'd save some lives in the short term but it would be like putting a Band-Aid over a

serious wound." [59] Kragen noted that experts had predicted that it would take at least 10 to 20 years to make a slight difference to Africa's long-term problems. [59]

In June 1985, the first USA for Africa cargo jet carrying food, medicine and clothing departed for Ethiopia and the Sudan. It stopped en route in New York, where 15,000 T-shirts were added to the cargo. Included in the supplies were high-protein biscuits, high-protein vitamins, medicine, tents, blankets and refrigeration equipment. [61] Harry Belafonte, representing the USA for Africa musicians, visited Sudan in the same month. The trip was his last stop on a four nation tour of Africa. Tanzanian Prime Minister Salim Ahmed Salim greeted and praised Belafonte, telling him, "I personally and the people of Tanzania are moved by this tremendous example of human solidarity." [62]

One year after the release of "We Are the World", organizers noted that \$44.5 million had been raised for USA for Africa's humanitarian fund. They stated that they were confident that they would reach an initial set target of \$50 million. [63] By October 1986, it was revealed that their \$50 million target had been met and exceeded; CBS Records gave USA for Africa a check for \$2.5 million, drawing the total amount of money to \$51.2 million. [64] USA for Africa's Hands Across America event had also raised a significant amount of money - approximately \$24.5 million for the hungry in the US. [64]

Since its release, "We Are the World" has raised over \$63 million for humanitarian causes. [65] Ninety percent of the money was pledged to African relief, both long and short term. [64][66] The long term initiative included efforts in birth control and food production. [66] The remaining 10 percent of funds was earmarked for domestic hunger and homeless programs in the US. [64][66] From the African fund, over 70 recovery and development projects were launched in seven African nations. Such projects included aid in agriculture, fishing, water management, manufacturing and reforestation. Training programs were also developed in the African countries of Mozambique, Senegal, Chad, Mauritania, Burkina Faso and Mali. [64]

[edit] Notable live performances

"We Are the World" has been performed live by members of USA for Africa on several occasions both together and individually. One of the earliest such performances came in 1985, during the rock music concert Live Aid, which ended with more than 100 musicians singing the song on stage. [67][68] Harry Belafonte and Lionel Richie made surprise appearances for the live rendition of the song. [69] Michael Jackson would have joined the artists, but was "working around the clock in the studio on a project that he's made a major commitment to", according to his press agent, Norman Winter. [70]

An inaugural celebration was held for US President-elect Bill Clinton in January 1993. [71] The event was staged by Clinton's Hollywood friends at the Lincoln Memorial and drew hundreds of thousands of people. [71] Aretha Franklin, LL Cool J, Michael Bolton and Tony Bennett were among some of the musicians in attendance. [71][72] Said Jones, "I've never seen so many great performers come together with so much love and selflessness." [73] The celebration included a performance of "We Are the World", which involved Clinton, his daughter Chelsea, and his wife Hillary singing the song along with USA for Africa's Kenny Rogers, Diana Ross and Michael Jackson. [71] The New York Times' Edward Rothstein commented on the event, stating, "The most enduring image may be of Mr. Clinton singing along in 'We Are the World', the first President to aspire, however futilely, to hipness." [74]

Michael Jackson died in June 2009, after suffering a cardiac arrest. [75] His memorial service was held several days later on July 7, and was reported to have been viewed by more than one billion people. [76] The finale of the event featured group renditions of the Jackson anthems "We Are the World" and "Heal the World". [77] The singalong of "We Are the World" was led by Darryl Phinnessee, who had worked with Jackson since the late 1980s. [77][78] It also featured co-writer Lionel Richie and Jackson's family, including his children. [77][78] Following the performance, "We Are the World" re-entered the US charts for the first time since its 1985 release. The song debuted at number

50 on Billboard's Hot Digital Songs chart.[79]

Cantonese and Mandarin Chinese versions of the song was collectively recorded by many Hong Kong and Taiwan singers for a half day public show æ ,â ¸ ,â ¸- æ¼~è~¸- ââ -æ¼~ ('Love Without Borders' Entertainment Industry Extravaganza) in Hong Kong to raise fund.[80][81] As they don't own the copyright of the song, the whole performance was not published as DVD.

[edit] 25 for Haiti

On January 12, 2010, Haiti was struck by a magnitude-7.0 earthquake, the country's most severe earthquake in over 200 years.[82] The epicenter of the quake was just outside the Haitian capital Port-au-Prince.[83] Over 230,000 civilians have been confirmed dead by the Haitian government because of the disaster and around 300,000 have been injured. Approximately 1.2 million people are homeless and it has been reported that the lack of temporary shelter may lead to the outbreak of disease.[84][85]

To raise money for earthquake victims, a new celebrity version of "We Are the World" was recorded on February 1, 2010 and released on February 12, 2010. Over 75 musicians were involved in the remake, which was recorded in the same studio as the 1985 original.[86] The new version features revised lyrics as well as a rap segment pertaining to Haiti.[86][87] Michael Jackson's younger sister Janet duets with her late brother on the track, as per a request from their mother Katherine. In the video and on the track, archive material of Michael Jackson is used from the original 1985 recording.[88]

On February 20, 2010, a non-celebrity remake, "We Are the World 25 for Haiti (YouTube Edition)", was posted to the video sharing website YouTube. Internet personality and singer-songwriter Lisa Lavie conceived and organized the Internet collaboration of 57 unsigned or independent YouTube musicians geographically distributed around the world. Lavie's 2010 YouTube version, a cover of the 1985 original, excludes the rap segment and minimizes the Auto-tune that characterizes the 2010 celebrity remake.[89] Another 2010 remake of the original is the Spanish-language "Somos El Mundo". It was written by Emilio Estefan and his wife Gloria Estefan, and produced by Emilio, Quincy Jones and Univision Communications, the company that funded the project.[90]

[edit] Legacy

"We Are the World" has been recognized as a politically important song, which "affected an international focus on Africa that was simply unprecedented".[43] It has been credited with creating a climate in which musicians from around the world felt inclined to follow.[43] According to The New York Times' Stephen Holden, since the release of "We Are the World", it has been noted that movement has been made within popular music to create songs that address humanitarian concerns.[91] "We Are the World" was also influential in subverting the way music and meaning were produced, showing that musically and racially diverse musicians could work together both productively and creatively.[45]Ebony described the January 28 recording session, in which Quincy Jones brought together a multi-racial group, as being "a major moment in world music that showed we can change the world".[92] "We Are the World", along with Live Aid and Farm Aid, demonstrated that rock music had become more than entertainment, but a political and social movement.[93] Journalist Robert Palmer noted that such songs and events had the ability to reach people around the world, send them a message, and then get results.[93]

Since the release of "We Are the World", numerous songs have been recorded in a similar fashion, with the intent to aid famine victims throughout the world. One such example involved a supergroup of Latin musicians billed as "Hermanos del Tercer Mundo", or "Brothers of the Third World". Among the supergroup of 62Â recording artists were Julio Iglesias, JosÃ© Feliciano and SÃ©rgio Mendes. Their famine relief song was recorded in the same studio as "We Are the World". Half of the profits raised from the charity single was pledged to USA for Africa. The rest of the money was to be used for impoverished Latin American countries.[94]

The 20th anniversary of "We Are the World" was celebrated in 2005. Radio stations around the world paid homage to Michael Jackson, Lionel Richie and USA

for Africa's creation by simultaneously broadcasting the charity song. In addition to the simulcast, the milestone was marked by the release of a two-disc DVD called *We Are the World: The Story Behind the Song*.^[95] Ken Kragen asserted that the reason behind the simulcast and DVD release was not for USA for Africa to praise themselves for doing a good job, but to "use it to do some more good [for the original charity]. That's all we care about accomplishing."^[95] Harry Belafonte also commented on the 20thth anniversary of the song. The entertainer acknowledged that "We Are the World" had "stood the test of time"; anyone old enough to remember it can still at least hum along.^[96]

An instrumental version of this song appeared in an early 2013 North Korean propaganda film.^[97]

[edit] Charts and certifications

Preceded[^] by "Tears Are Not Enough" by Northern Lights
 Canadian number-one single
 May 4th ^ 18, 1985
 Succeeded[^] by "Crazy for You" by Madonna
 Preceded[^] by "Nightshift" by Commodores
 Dutch number-one single
 April 20th ^ May 25, 1985
 Succeeded[^] by "Don't You (Forget About Me)" by Simple Minds
 Preceded[^] by "Johnny, Johnny" by Jeanne Mas
 French number-one single
 May 5th ^ 19, 1985
 Succeeded[^] by Chanteurs sans Frontières by Éthiopie
 Preceded[^] by "Shout" by Tears for Fears (dated April 5, 1985)
 New Zealand number-one single
 April 19th ^ May 31, 1985
 Succeeded[^] by "Everybody Wants to Rule the World" by Tears for Fears
 Preceded[^] by "You Spin Me Round (Like a Record)" by Dead or Alive
 Swiss number-one single
 May 5th ^ June 9, 1985
 Succeeded[^] by "19" by Paul Hardcastle
 Preceded[^] by "I Should Have Known Better" by Jim Diamond
 Australian Kent Music Report number-one single
 April 8th ^ June 3, 1985
 Succeeded[^] by "Would I Lie to You?" by Eurythmics
 Preceded[^] by "Easy Lover" by Philip Bailey feat. Phil Collins
 UK number-one single
 April 20th ^ 27, 1985
 Succeeded[^] by "Move Closer" by Phyllis Nelson
 Preceded[^] by "One More Night" by Phil Collins
 Billboard Hot 100 number-one single
 April 13th ^ May 4, 1985
 Succeeded[^] by "Crazy for You" by Madonna
 Preceded[^] by "Rhythm of the Night" by DeBarge
 Billboard Hot Black number-one single
 May 4th ^ 11, 1985
 Succeeded[^] by "Fresh" by Kool & the Gang
 Preceded[^] by "One More Night" by Phil Collins
 Billboard Adult Contemporary number-one single
 April 20th ^ 27, 1985
 Succeeded[^] by "Rhythm of the Night" by DeBarge

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Liverpool Football Club's participation in European competitions organised by Union of European Football Associations (UEFA) began in 1964. Since then, Liverpool have won eleven European trophies, making them Britain's most successful team in UEFA competitions. They have won the UEFA Champions League (formerly known as the European Cup) five times, the UEFA Europa League (formerly known as the UEFA Cup) three times, and the UEFA Super Cup three times. Liverpool qualified for European competitions for 21 consecutive seasons until the 1985 European Cup Final, the occasion of the Heysel Stadium disaster, following which the club was banned from Europe for six seasons. Since being readmitted, they have qualified for the Champions League eight times and the UEFA Cup seven times. As a result of their victory in the 2005 UEFA Champions League Final, Liverpool won the European Champion Clubs' Cup trophy (pictured) outright. Bob Paisley is the club's most successful manager in Europe, with five trophies. Liverpool's biggest win in Europe is an 11–0 victory over Strømsgodset in the 1974–75 European Cup Winners' Cup. In European competitions, Jamie Carragher holds the club record for the most appearances, with 139, and Steven Gerrard is the club's record goalscorer, with 38 goals. (Full article...)

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1855 Michigan State University in East Lansing, Michigan, was founded as the Agricultural College of the State of Michigan, the United States' first agricultural college.

1912 Xinhai Revolution: Puyi, the last Emperor of China, abdicated under a deal brokered by military official and politician Yuan Shikai, formally replacing the Qing Dynasty with a new republic in China.

1974 Russian author Aleksandr Solzhenitsyn was arrested and subsequently deported from the Soviet Union for writing The Gulag Archipelago, an exposé of the Soviet forced labour camp system.

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This Wikipedia is written in English. Started in 2001^Â (2001), it currently contains 4,164,169 articles. Many other Wikipedias are available; some of the largest are listed below.

Venture Science Fiction was an American digest-size science fiction magazine, first published from 1957 to 1958, and revived for a brief run in 1969 and 1970. Ten issues were published of the 1950s version, with another six in the second run. It was founded in both instances as a companion to The Magazine of Fantasy & Science Fiction; Robert P. Mills edited the 1950s version, and Edward L. Ferman was editor during the second run. A British edition appeared for 28 issues between 1963 and 1965; it reprinted material from The Magazine of Fantasy & Science Fiction as well as from the US edition of Venture. There was also an Australian edition, which was identical to the British version but dated two months later.

The original version was only moderately successful, although it is remembered for the first publication of Sturgeon's Law. The publisher, Joseph Ferman (father of Edward Ferman), declared that he wanted well-told stories of action and adventure; the resulting fiction contained more sex and violence than was usual for the science fiction (sf) genre in the late 1950s, and sf historian Mike Ashley has suggested that the magazine was ahead of its time. It succumbed to poor sales within less than two years. The second US version was no more successful, with less attractive cover art and little in the way of notable fiction, though it did publish Vonda McIntyre's first story. By the end of 1970, Venture had ceased publication permanently.

[edit] First US run

In late 1949, publisher Lawrence E. Spivak launched The Magazine of Fantasy, one of many new titles in a crowded field of genre magazines. The title was changed to The Magazine of Fantasy & Science Fiction (usually abbreviated

to F&SF) with the second issue, and the new magazine rapidly became successful and influential within the science fiction field.[1] The editors were Anthony Boucher and J. Francis McComas, and the managing editor was Robert P. Mills. In 1954, Joseph Ferman, a partner of Spivak's, bought the magazine from him.[2] Ferman subsequently decided to launch a companion magazine, and gave it to Mills to edit.[3]

The new magazine was titled *Venture Science Fiction*, and the first issue was dated January 1957. Mills was managing editor of F&SF throughout *Venture's* first run; he became editor of F&SF shortly after *Venture* ceased publishing in July 1958.[3] The editorial philosophy was laid out by Ferman in the inaugural issue: "strong stories of action and adventure" ... There will be two prime requisites for *Venture* stories: In the first place, each must be a well-told story, with a beginning, middle and end; in the second place, each must be a strong story—a story with pace, power and excitement." [4] Ferman hoped to take advantage of a gap in the science fiction magazine market opened up by the demise of *Planet Stories*, one of the last sf pulps, which had ceased publication in late 1955.[3] *Planet Stories* had focused on adventure stories, as opposed to the realistic style becoming more popular in science fiction in the 1950s,[5] and Ferman hoped to combine the virtues of the melodramatic pulp fiction style with the literary values that were key to F&SF's success.[3] *Venture's* bias towards action-oriented adventure led to stories with relatively more sex and violence than those in competing magazines, and sf historian Mike Ashley has commented that it was perhaps five or ten years ahead of its time. One story, "The Girl Had Guts", by Theodore Sturgeon, involved an alien virus that caused its victims to vomit up their intestines; Ashley records a reviewer saying that the story made him physically ill.[6][7]

Ed Emshwiller supplied eight of the ten covers; he had sold several covers to F&SF by this time, so his work reinforced the sense of connection between the two magazines.[3] Emshwiller also contributed interior illustrations in the first issue, but the main interior artist was John Giunta, with John Schoenherr contributing some of his earliest work to several of the later issues.[3][8]

Some well-known writers appeared during this incarnation of *Venture*, including Isaac Asimov, Clifford Simak, Marion Zimmer Bradley, Robert Silverberg, and Damon Knight. Not all the fiction was adventure oriented. For example, Sturgeon's story "The Comedian's Children" tells of a telethon host and his relationship with his sponsors, and Leigh Brackett's "All the Colors of the Rainbow" deals with racism after aliens have contacted humanity. These and other examples can be regarded as stories of character with strong themes, in keeping with Ferman's stated goals in his inaugural editorial.[3] *Venture* was also the place that "Sturgeon's Law" first saw print. This adage is now usually seen in the form "90% of everything is crap". It was formulated by Sturgeon in about 1951, and a version of it appeared in the March 1958 issue of *Venture*, under the name "Sturgeon's Revelation".[9][10]

An editorial, "Venturings," appeared in each issue of the first series; after Ferman used the first one as a platform for editorial policy, it was usually written by Mills, who occasionally turned the column over to letters from SF figures. The very last editorial, in July 1958, featured a eulogy of C.M. Kornbluth by Frederik Pohl, and one of Henry Kuttner by Sturgeon. Kornbluth and Kuttner had died within two months of each other earlier that year.[3][8]

Sturgeon began a book review column, "On Hand . . . Offhand", in the July 1957 issue that continued for the rest of the magazine's run. This was Sturgeon's first review column; more than a decade later he wrote a similar column for *Galaxy Science Fiction*. The January 1958 issue saw the first in a series of four science articles by Asimov that also continued until *Venture* folded. The series was transferred to F&SF, beginning with the November 1958 issue, and eventually ran to 399 consecutive articles; it is not often remembered that it began in F&SF's short-lived companion magazine.[3][8]

Venture kept to a steady bimonthly schedule for ten issues, but its circulation never reached a sustainable level, and it was canceled in mid-1958. The large number of competing magazines probably hurt sales, though since many

of the competitors lasted for only one or two issues, Venture can be thought of as at least a partial success.[3]

[edit] British and Australian editions

In December 1959, a British edition of F&SF appeared from Atlas Publishing and Distributing Limited, a London-based publisher. Atlas had published a British edition of Analog (formerly Astounding Science Fiction) since 1939. In 1963 the abolition of import restrictions meant that Analog could be directly imported, and since there was no longer a need for a British edition, Atlas decided to start a new sf magazine to replace it. The new Venture Science Fiction drew many of its stories from the US version, but it also reprinted from the late 1950s F&SF, since there had been no British edition of that magazine until the end of 1959. Within a year Atlas decided to abandon their edition of F&SF as well; the last issue appeared in June 1964.[11]

The British version of Venture began in September 1963, and ran for 28 numbered issues, through December 1965; the editor was Ronald R. Wickers.[12] The stories selected from F&SF for the UK edition of Venture did not overlap with material already reprinted in the UK edition of F&SF.[7] The first five issues had pictorial covers, but thereafter the cover simply listed the names of the contributing authors. This unattractive presentation, and the lack of much in the way of interior artwork, probably hurt sales. Atlas's stated reason for ending the magazine was that it was "due to the expiration of available material", but there were in fact many stories available to reprint. It is more likely that the real reason was that the US edition of F&SF was by then easily available in the UK, and that circulation was falling.[11]

Atlas also published an Australian edition, which was identical to the British edition except that it was dated two months later; the issues ran from November 1963 to February 1966.[11]

[edit] Second US run

A little over ten years after the first US edition ceased, a new version appeared, again as a companion to F&SF. This time the magazine was quarterly. The debut issue was dated May 1969, and it was edited by Edward L. Fermanâ ~son of Joseph Fermanâ ~who was also the editor of F&SF. There was no statement of editorial intent for this version, but the policy was straightforward: a novel was presented in each issue. Although these were substantially cut, they still took up most of the magazine, with the result that the other stories tended to be very short. As in the first incarnation, the contents were of fairly good quality, with contributions from well-known writers.[7] However, the magazine was no more successful than before, and lasted for only six quarterly issues; the last issue was August 1970.[7]

The condensed novels that appeared in this version of Venture included Hour of the Horde, by Gordon R. Dickson; Plague Ship, by Harry Harrison; Star Treasure, by Keith Laumer; and Beastchild, by Dean R. Koontz.[3][8] The short fiction included little of note, though "The Snows Are Melted, the Snows Are Gone", an early story by James Tiptree, Jr., appeared in 1969, and "Breaking Point", by Vonda McIntyre, was published in February 1970.[3] "Breaking Point" was McIntyre's first published fiction, but, perhaps because it was published as by "V. N. McIntyre", it has been missed by several bibliographers.[13] There was also a Reginald Bretnor Feghoot story in each issue: these were a series of very short stories, based on bad puns, that had begun in F&SF the previous year.[3]

Ron Goulart contributed a book review column to each issue of the second incarnation, and there was an occasional film review.[3] This version of Venture did not credit the artists, but most of the covers were signed by Bert Tanner, who was listed on the masthead as the art director. Tanner's cover art was much less distinguished than Emshwiller's work for the first run of the magazine, and it is likely that this had a negative effect on sales: Tanner's work has been likened to "pencil sketches overlaid by a single color".[3] Tanner also contributed much, but not all, of the interior art; other artists who can be identified by their signatures include Emshwiller, Derek Carter, and Bhob Stewart, who illustrated Tiptree's story in the November 1969 issue.[8]

[edit] Bibliographic details

Jan

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Issues of Venture, showing volume/issue number, and color-coded to show who was editor for each issue: Robert P. Mills for the first US version, Ronald R. Wickers for the UK edition, and Edward L. Ferman for the second US version.[12]

For the first incarnation, Venture was priced at 35 cents throughout, and maintained a 128-page count along with a regular bimonthly schedule, starting with January 1957 and ending with the July 1958 issue. The first volume had six numbers, and the second had four. The British edition was numbered consecutively from 1 to 28 without any volume numbers, and was priced at 2/6 (â ¤0.12 1â 2) until the July 1964 issue, after which the price was 3/- (â ¤0.15). The second US version began in May 1969 with volume 3 number 1, and maintained a regular quarterly schedule until the last issue in August 1970. Each issue was priced at 60Â cents, and like its predecessor had a page count of 128.[3][8][11]

After the first US edition ceased publication, F&SF added the line "including Venture Science Fiction" to the masthead, in order to ensure that the publisher retained the rights to the title. The line reappeared in February 1971, several months after the failure of the second US edition, and was finally dropped in February 1990.[3][8]

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^ Thomas D. Claeson, "The Magazine of Fantasy & Science Fiction", in Tymn & Ashley, Science Fiction, Fantasy, and Weird Fiction Magazines, p.Â 380.
^ a b c d e f g h i j k l m n o p q r Nicholas S. De Larber, "Venture Science Fiction (1969â ^1970) (1957â ^1958)", in Tymn & Ashley, Science Fiction, Fantasy, and Weird Fiction Magazines, p.Â 705â ^709.
^ Quoted in Nicholas S. De Larber, "Venture Science Fiction (1969â ^1970) (1957â ^1958)", in Tymn & Ashley, Science Fiction, Fantasy, and Weird Fiction Magazines, p.Â 705â ^709.
^ Thomas D. Claeson, "Planet Stories", in Tymn & Ashley, Science Fiction, Fantasy, and Weird Fiction Magazines, pp.Â 476â ^481.
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^ a b Ashley, Transformations, p.Â 346.
^ See for example John Clute, "Vonda Neel McIntyre", in Nicholls & Clute, Encyclopedia of SF, p.Â 757.

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The Arctic Tern (*Sterna paradisaea*) is a seabird of the tern family Sternidae. This bird has a circumpolar breeding distribution covering the Arctic and sub-Arctic regions of Europe, Asia, and North America (as far south as Brittany and Massachusetts). The species is strongly migratory, seeing two summers each year as it migrates from its northern breeding grounds along a winding route to

the oceans around Antarctica and back, a round trip of about 70,900 km (c. 44,300 miles) each year.[3] This is by far the longest regular migration by any known animal. The Arctic Tern flies as well as glides through the air, performing almost all of its tasks in the air. It nests once every one to three years (depending on its mating cycle); once it has finished nesting it takes to the sky for another long southern migration.

Arctic Terns are medium-sized birds. They have a length of 33–39 cm (13–15 in) and a wingspan of 76–85 cm (26–30 in). They are mainly grey and white plumaged, with a red beak (as long as the head, straight, with pronounced gonys) and feet, white forehead, a black nape and crown (streaked white), and white cheeks. The grey mantle is 305 mm, and the scapulae are fringed brown, some tipped white. The upper wing is grey with a white leading edge, and the collar is completely white, as is the rump. The deeply forked tail is whitish, with grey outer webs. The hindcrown to the ear-coverts is black.

Arctic Terns are long-lived birds, with many reaching thirty years of age. They eat mainly fish and small marine invertebrates. The species is abundant, with an estimated one million individuals. While the trend in the number of individuals in the species as a whole is not known, exploitation in the past has reduced this bird's numbers in the southern reaches of its range.

[edit] Distribution and migration

The Arctic Tern has a worldwide, circumpolar breeding distribution which is continuous; there are no recognized subspecies. It can be found in coastal regions in cooler temperate parts of North America and Eurasia during the northern summer. While wintering during the southern summer, it can be found at sea, reaching the southern edge of the Antarctic ice.[4]

The Arctic Tern is famous for its migration; it flies from its Arctic breeding grounds to the Antarctic and back again each year. This 19,000 km (12,000 mi) journey each way ensures that this bird sees two summers per year and more daylight than any other creature on the planet.[5] One example of this bird's remarkable long-distance flying abilities involves an Arctic Tern ringed as an unfledged chick on the Farne Islands, Northumberland, UK, in the northern summer of 1982, which reached Melbourne, Australia, in October 1982, a sea journey of over 22,000 km (14,000 mi) in just three months from fledging.[6] Another example is that of a chick ringed in Labrador, Canada, on 23 July 1928. It was found in South Africa four months later.[7]

Research using tracking devices attached to the birds was published in January 2010 and showed that the above examples are in fact not unusual for the species; eleven Arctic Terns that bred in Greenland or Iceland each covered 70,900 km on average in a year, with a maximum of 81,600 km. The difference from previous estimates was because the birds were found to take a meandering course to take advantage of prevailing winds.[3] The average Arctic Tern lives about twenty years, and will travel about 2.4 million km (1.5 million mi).

Arctic Terns usually migrate far offshore.[8] Consequently, they are rarely seen from land outside the breeding season.

[edit] Description and taxonomy

The Arctic Tern is a medium-sized bird around 33–36 cm (13–15 in) from the tip of its beak to the tip of its tail. The wingspan is 76–85 cm.[8] The weight is 86–127 g (3.0–4.5 oz). The beak is dark red, as are the short legs and webbed feet. Like most terns, the Arctic Tern has high aspect ratio wings and a tail with a deep fork.[8]

The adult plumage is grey above, with a black nape and crown and white cheeks. The upperwings are pale grey, with the area near the wingtip being translucent. The tail is white, and the underparts pale grey. Both sexes are similar in appearance. The winter plumage is similar, but the crown is whiter and the bills are darker.[8]

Juveniles differ from adults in their black bill and legs, "scaly" appearing wings, and mantle with dark feather tips, dark carpal wing bar, and short tail streamers.[8] During their first summer, juveniles also have a whiter forecrown.[9]

The species has a variety of calls; the two most common being the alarm call,

made when possible predators (such as humans or other mammals) enter the colonies, and the advertising call.[10] The advertising call is social in nature, made when returning to the colony and during aggressive encounters between individuals. It is unique to each individual tern and as such it serves a similar role to the bird song of passerines, identifying individuals. Eight other calls have been described, from begging calls made by females during mating to attack calls made while swooping at intruders.

While the Arctic Tern is similar to the Common and Roseate Terns, its colouring, profile, and call are slightly different. Compared to the Common Tern, it has a longer tail and mono-coloured bill, while the main differences from the Roseate are its slightly darker colour and longer wings. The Arctic Tern's call is more nasal and rasping than that of the Common, and is easily distinguishable from that of the Roseate.[11]

This bird's closest relatives are a group of South Polar species, the South American (*Sterna hirundinacea*), Kerguelen (*S. virgata*), and Antarctic (*S. vittata*) Terns.[12] On the wintering grounds, the Arctic Tern can be distinguished from these relatives; the six-month difference in moult is the best clue here, with Arctic Terns being in winter plumage during the southern summer. The southern species also do not show darker wingtips in flight.

The immature plumages of Arctic Tern were originally described as separate species, *Sterna portlandica* and *Sterna pikei*. [13]

[edit] Reproduction

Breeding begins around the third or fourth year.[14] Arctic Terns mate for life, and in most cases, return to the same colony each year.[15] Courtship is elaborate, especially in birds nesting for the first time.[16] Courtship begins with a so-called "high flight", where a female will chase the male to a high altitude and then slowly descend. This display is followed by "fish flights", where the male will offer fish to the female. Courtship on the ground involves strutting with a raised tail and lowered wings. After this, both birds will usually fly and circle each other.[16]

Both sexes agree on a site for a nest, and both will defend the site. During this time, the male continues to feed the female. Mating occurs shortly after this.[16] Breeding takes place in colonies on coasts, islands and occasionally inland on tundra near water. It often forms mixed flocks with the Common Tern. It lays from one to three eggs per clutch, most often two.[8]

It is one of the most aggressive terns, fiercely defensive of its nest and young. It will attack humans and large predators, usually striking the top or back of the head. Although it is too small to cause serious injury to an animal of a human's size, it is still capable of drawing blood, and is capable of repelling many raptorial birds and smaller mammalian predators such as foxes and cats.[5] Other nesting birds, such as alcids, often incidentally benefit from the protection provided by nesting in an area defended by Arctic Terns.

The nest is usually a depression in the ground, which may or may not be lined with bits of grass or similar materials. The eggs are mottled and camouflaged.[8] Both sexes share incubation duties. The young hatch after 22â ^27 days and fledge after 21â ^24 days.[8] If the parents are disturbed and flush from the nest frequently the incubation period could be extended to as long as 34 days.[10]

When hatched, the chicks are downy. Neither altricial nor precocial, the chicks begin to move around and explore their surroundings within one to three days after hatching.[17] Usually, they do not stray far from the nest. Chicks are brooded by the adults for the first ten days after hatching.[18] Both parents care for hatchlings.[8] Chick diets always include fish, and parents selectively bring larger prey items to chicks than they eat themselves.[10] Males bring more food than females. Feeding by the parents lasts for roughly a month before being weaned off slowly.[8] After fledging, the juveniles learn to feed themselves, including the difficult method of plunge-diving.[19] They will fly south to winter with the help of their parents.[20]

Arctic Terns are long-lived birds that spend considerable time raising only a few young, and are thus said to be K-selected.[21] The maximum recorded life

span for the species is 34 years,[22] although the average lifespan is about 20 years[15][23] A study in the Farne Islands estimated an annual survival rate of 82%.[24]

[edit] Ecology and behaviour

The diet of the Arctic Tern varies depending on location and time, but is usually carnivorous. In most cases, it eats small fish or marine crustaceans.[4][8] Fish species comprise the most important part of the diet, and account for more of the biomass consumed than any other food. Prey species are immature (1â ^2 year old) shoaling species such as herring, cod, sandlances, and capelin.[5] Among the marine crustaceans eaten are amphipods, crabs and krill. Sometimes, these birds also eat molluscs, marine worms, or berries, and on their northern breeding grounds, insects.[17]

Arctic Terns sometimes dip down to the surface of the water to catch prey close to the surface. They may also chase insects in the air when breeding.[17] It is also thought that Arctic Terns may, in spite of their small size, occasionally engage in kleptoparasitism by swooping at birds so as to startle them into releasing their catches.[17] Several species are targetedâ ~conspecifics, other terns (like the Common Tern), and some auk and grebe species.[10]

While nesting, Arctic Terns are vulnerable to predation by cats and other animals.[4] Besides being a competitor for nesting sites, the larger Herring Gull steals eggs and hatchlings. Camouflaged eggs help prevent this, as do isolated nesting sites.[19] While feeding, skuas, gulls, and other tern species will often harass the birds and steal their food.[25] They often form mixed colonies with other terns, such as Common and Sandwich Terns.

[edit] Conservation status

Arctic Terns are considered threatened or species of concern in certain states. They are also among the species to which the Agreement on the Conservation of African-Eurasian Migratory Waterbirds applies.[26] The species reduced population in New England in the late nineteenth-century because of hunting for the millinery trade.[10] Exploitation continues today in western Greenland, where the species has reduced population greatly since 1950.[27]

At the southern part of their range, the Arctic Tern has been reducing in numbers. Much of this is due to lack of food.[9] However, most of these birds' range is extremely remote, with no apparent trend in the species as a whole.[17]

''Birdlife International has considered the species to be at lower risk since 1988, believing that there are approximately one million individuals around the world.[2]

[edit] Cultural depictions

The Arctic Tern has appeared on the postage stamps of several countries and dependent territories. Territories include the Å land Islands, Alderney, and Faroe Islands. Countries include Canada, Finland, Iceland, and Cuba.[28]

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"The Other Woman" is the 78th episode of the serial drama television series *Lost* and the sixth episode of the show's fourth season. It aired on March 6, 2008 on the American Broadcasting Company (ABC) in the United States and on CTV in Canada.[1] The episode was written by co-executive producer Drew Goddard and executive story editor Christina M. Kim, and was directed by Eric Laneuville.[2]

The narrative begins on December 24, 2004, 94 days after the crash of Oceanic Airlines Flight 815. Recent island arrivals Daniel Faraday (played by Jeremy Davies) and Charlotte Lewis (Rebecca Mader) leave the survivors' camp without notice for the Dharma Initiative electrical station called the Tempest. In flashbacks that depict events on the island, Juliet Burke (Elizabeth Mitchell) discovers that her boss Ben Linus (Michael Emerson), the leader of the island's original inhabitants referred to as the Others, is in love with her.[3]

The writers advanced several story lines with "The Other Woman". The episode furthers Juliet's back story and relationships, sheds more light on the season's new characters, and features the first appearance of Harper Stanhope (Andrea Roth). The introduction of the Tempest further develops the series' mythology, specifically the "purge". In the third season, the purge was mentioned in episode "Enter 77" and seen in "The Man Behind the Curtain".[4]

"The Other Woman" was watched by 15 million Americans and received mixed reviews. Critics from the *Los Angeles Times*, *Entertainment Weekly*, and *BuddyTV* deemed it the worst episode of the season, partially due to a flashback storyline that was seemingly recycled from the third season episode, "One of Us". Another criticism was that audiences actually learned more about Ben than Juliet, despite the focus on Juliet. Emerson also received more praise for his acting than Mitchell, who plays Juliet; however, Mitchell won a Saturn Award for her performance. Positive reviews commended the action in the episode's climax.

The episode opens with flashbacks to Juliet's life on the island following her recruitment in September 2001 by the Others.[5] Juliet has an affair with an Other named Goodwin (Brett Cullen), who is married to therapist Harper Stanhope. Harper discovers the affair, and warns Juliet that their leader Ben will punish Goodwin because he has a crush on Juliet. Following the crash of Flight 815, Ben sends him to infiltrate a group of surviving passengers; Goodwin is killed by Ana Lucia Cortez after she realizes he is not a survivor.[6] In October 2004, Ben invites Juliet to what he initially describes as a dinner party, but is actually a private date. Ben leads Juliet to Goodwin's impaled corpse, where she accuses him of having wanted Goodwin to die. Ben reveals his love for her.[7]

On the night of December 24, 2004 (three months after the crash of Flight 815), two members of a science team from the *Kahana* freighter anchored offshore[8]—Daniel and Charlotte—who landed on the island three days earlier with a hidden agenda, sneak off to find the Tempest. Juliet and the crash survivors' leader Jack Shephard (Matthew Fox) notice their absence from the beach camp and pursue them. After hearing the whispers, Harper approaches Juliet. She tells her that Daniel and Charlotte intend to kill everyone on the island by deploying a lethal gas at the Tempest and that Ben's orders are for Juliet to kill them. On a trek back to the beach in the morning, Kate encounters Daniel and Charlotte and is knocked unconscious by the latter. Jack and Juliet come across Kate and they split up: Juliet continues for the Tempest alone, as Jack minds Kate. Inside the station, Juliet finds Daniel in a hazmat suit at a computer. After a standoff, Daniel and Charlotte convince Juliet that they are not going to kill anyone; they are neutralizing the gas in case Ben decides to use it again, as he had twelve years earlier in an Others-led purge of Dharma.[9] Jack arrives at the Tempest and Juliet explains that those on the freighter came to the island to wage war against Ben and she expects him to win. She fears for Jack because Ben thinks that she belongs to him, but Jack shows no worry and kisses her.[7]

In the Barracks, Ben bargains with 815 survivor John Locke (Terry O'Quinn) for

his freedom. He reveals that Charles Widmore (Alan Dale)âthe father of Desmond Hume's (Henry Ian Cusick) girlfriend, Penny (Sonya Walger)[10]âowns the freighter and hopes to exploit the island. Ben also tells Locke who his spy on the freighter is. Ben continues to reside in the Barracks following his release.[7]

[edit] Production

When asked about what she learned about her character through "The Other Woman", Elizabeth Mitchell surmised that Juliet's "mistakes are morally questionable, if not morally wrong. But you do see that behind this is a human being who is struggling to live and have a life that makes sense to her." [12] Mitchell did not think that Juliet was too surprised that Ben has romantic feelings for her, but "it was horrifying under the circumstances" because she had just found out that Goodwin had died. Michael Emerson thought that his character Ben was childish when he shouted "you're mine!" to Juliet; Mitchell compared him to "a twelve-year-old boy throwing a temper tantrum overÂ... his first love". [13] Mitchell said that "it was emotionally draining shooting this episode" because she was intimidated by Emerson and Matthew Fox's acting skills. [11]

Co-executive producer and staff writer Adam Horowitz stated that "It's always interesting to pull back another layer on one of our characters, and to see another chapter in Juliet's story on the island and bring us to where she is now was great", while fellow co-executive producer and staff writer Edward Kitsis thought that "the interesting thing about the episode is the way Ben looks at Juliet ... everything is informed by that look." Horowitz also enjoyed the juxtaposition of Juliet's character development with the revelations on the "freighter folk". Kitsis picked the episode's final scene where Hugo "Hurley" Reyes (Jorge Garcia) and James "Sawyer" Ford (Josh Holloway) discover that Ben has negotiated his release and will be dining with them that evening as his favorite of the episode. [14] Actress Rebecca Mader, who plays Charlotte, said that she was "so excited" for the episode to air because she thought that it was "even better" than the previous episode, [15] which is widely regarded as one of the best episodes of the series. [16] Charlotte knocks Kate unconscious with the barrel of her gun and asks "what?" to a speechless Daniel in "The Other Woman". Mader found this hilarious and described it as "the pinnacle of [her] career". [17]

Andrea Roth makes her first appearance as Harper in "The Other Woman". During casting in early October, Harper was described as "a tough, no-nonsense and beautiful [therapist who has a tendency to be] overly controlling and obsessive." The character was also noted as a recurring role; [18] however, Harper did not make another appearance in the season. The writers have since stated that she will eventually reappear. [19] A jungle scene with Mitchell, Fox and Roth was filmed until 4:00Âa.m. on OctoberÂ27, 2007 [20] with industrial sprinklers [21] and Mitchell referred to this as her "most intense experience on the show". [22] Harper's appearance and disappearance in this scene are sudden so fans speculated that this was actually an apparition or manifestation of the island's black smoke monster. This was refuted by Lost's writers. [23]

Named after William Shakespeare's 1610 play of the same name, the Tempest first appears in "The Other Woman" and is apparently alluded to on an unseen layer of the Dharma "Swan" station's blast door map of the second season. [19] The writers wanted to explain some of the island's history in the fourth season and decided that "The Other Woman" would reveal where the gas that Ben used came from and that Dharma had stations set up for protection against hostile forces. They also enjoyed having Goodwin on the show and wanted to bring him back. [19] "The Other Woman" had commenced filming by OctoberÂ11, 2007 [24] and was completed on OctoberÂ30. [25]

"The Other Woman" contains Jack and Juliet's second kiss. [26] Juliet was conceived by the writers as the next possible love interest for Jack [27] after the death of the second season character Ana Lucia Cortez (Michelle Rodriguez). [28] Fans hated Ana Lucia so the writers did not pursue the romantic story arc. [29] Mitchell guesses that her character was created because "they

needed a bridge between Ben and everyone else, and they needed someone to come in and be a little salt in the oyster of Jack and Kate." [11] She believes that Juliet did genuinely fall in love with Jack, [30] but not knowing whether "her attraction to Jack or her willingness to do anything to get off the island" is more important to her. [11] Juliet forms something of a "love rectangle" with Jack, Kate and Sawyer. [31] Mitchell "feel[s] like [Jack and Juliet have] a very grown-up relationship. They seem to really respect and like each other", whereas Sawyer and Kate are like "rambunctious teenagers". [11] The couple has gained an Internet fandom and been given the portmanteau nickname "Jacket". [32]

[edit] Reception

"The Other Woman" was watched live or recorded and watched within five hours of broadcast by 13.008 million viewers in the United States, [33] ranking seventh for the week in television programs with the most viewers and achieving a 5.4/13 in the coveted adults aged eighteen to forty-nine demographic. [34] Including those who watched within seven days of broadcast, the episode was watched by a total of 14.933 million American viewers; this number went toward the season's average. [35] 1.439 million Canadians watched it, making *Lost* the eighth highest-rated show of the week. [36] In the United Kingdom, 1.1 million people viewed the episode. [37] The episode brought in 691,000 viewers in Australia, placing it as the twenty-second most watched show of the night. [38]

A common claim by critics of *Entertainment Weekly*, *IGN*, [39] *SyFy Portal*, *AOL's TV Squad* [40] and *BuddyTV* was that more was learned about supporting player Ben, instead of Juliet who was centered on in flashbacks. Jeff Jensen of *Entertainment Weekly* praised Emerson's acting and stated that "in the end, this was really a story about Ben and the lengths he will go to protect himself and the Island from his enemies." [41] *SyFy Portal's* Dan Compora said that "The more I hate Ben, the more I realize that Michael Emerson is just a very fine actor doing his job." [42] Oscar Dahl of *BuddyTV* called Emerson an acting "god" and said that "The Other Woman" was "ostensibly a Juliet episode, [but] Ben's presence made a far bigger impression on me". [43] Despite Emerson's shadow, Elizabeth Mitchell received the award for "Best Supporting Actress on Television" at the 34th Saturn Awards in a tie with Summer Glau, who plays Cameron Phillips in *FOX's Terminator: The Sarah Connor Chronicles*. [44]

"The Other Woman" has been cited as the weakest episode of *Lost's* fourth season. Despite his claim, Patrick Day of the *Los Angeles Times* pointed out that "even this so-so episode of *Lost* stood far above anything else being shown on network TV this season". He noted that the "most heartbreaking scene" was Claire Littleton's (Emilie de Ravin) appearance because it reminded him of how little the character had done to advance the season's plot. [45] *BuddyTV's* John Kubicek dubbed "The Other Woman" "the worst episode of *Lost* season four so far" because it "followed the soap opera that is the romantic entanglements of the major players, which is not the reason most people love *Lost*." [46] Jeff Jensen of *Entertainment Weekly* graded the episode as a "Câ ^" and called it "the only true dud of the season". [47] He thought that its "story was kinda all over the place" and that "the whole thing felt forced". Jensen was not fond of Andrea Roth's guest performance because he felt that "she came off as too arch and unreal." [48] In contrast, *TV Guide's* Bruce Fretts praised Roth's "suitably creepy" appearance. [49] Other critics also reviewed the episode as poor. Maureen Ryan of *Chicago Tribune* said that "The Other Woman" "seemed somewhat pallid and predictable â | several elements â | felt like they'd been recycled from previous seasons and story arcs." [50] *The Star-Ledger's* Alan Sepinwall considered the episode to be the second weakest of the fourth season after "Eggtown". He criticized the Tempest storyline due to a lack of explanation for the station's original purpose and thought that Juliet's flashbacks were redundant. [51]

"The Other Woman" was also the subject of mixed reviews. Tim Goodman of the *San Francisco Chronicle* wrote that "I really liked this episode, but I liked it less than the [preceding episodes] â | it seems that someone took their foot off the gas just a fraction and the reduction in speed was notable. [52] *Time's* James Poniewozik had mixed feelings for the flashbacks, but enjoyed Ben's character

development.[53] Nikki Stafford of Wizard "enjoyed" the "interesting" episode, although "not nearly as much" as the previous episode. She rejoiced at the return of her "favorite Other" Tom (M.C. Gainey) and wrote that "Locke used to be one of [her] favorite characters, but now he's a tool".[54]Digital Spy's Ben Rawson-Jones stated that "the episode came together nicely in the end, with an expected twist and a snog, although for a great part it bordered on tedium. Juliet is a character who simply isn't interesting enough to fully sustain one's attention over a flashback. She's been so peripheral and irrelevant over this season, and it felt like a token gesture to foreground her at last. There was a nice pay off though, with a long awaited smooch between her and Jack."[55] Daniel of TMZ graded the episode as a "C+"; however, he wrote that "the Ben/Locke scenes were great and Juliet in a bikini did not disappoint."[56] TV Squad's Erin Martell was "not impressed with Jack and Juliet's chemistry" and found their kiss "unconvincing". Martell commended Emerson's acting, Ben's one-liners and his "too funny for words" casual greeting to Hurley and Sawyer at the end of the episode after he is released from captivity.[40]The Huffington Post's Jay Glatfelter thought that "this was another great episode [that] could have lived up to last week's episode, but there was still a lot of solid character development."[57]

Verne Gay of Newsday referred to the episode as "yet another brilliant outing by TV's best drama [that] keeps getting better"; she was not the only critic to give a positive review.[58]E!'s Kristin Dos Santos thought that the fight scene between Juliet and Charlotte in the Tempest was "awesome" and suggested that Alan Dale receive a "lifetime achievement award for his parade of marvelously malicious patriarchs", such as Widmore.[59] Chris Carabott of IGN gave the episode a score of eight out of ten and described it as "a good episode of Lost that has all the action, suspense and excitement that this show consistently delivers". Carabott wrote that "seeing how twisted [Ben and Juliet's] 'relationship' really is was fascinating".[39] SyFy Portal's Dan Compora wrote that "this week's episode contributed to what is shaping up to be a pretty solid fourth season. â | Fine acting carried the episode despite a few potholes in the plot."[42] Compora also enjoyed the title and the "nice cat fight" in the Tempest between Juliet and Charlotte.[60]

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[edit] External links

Flocke (German pronunciation: [flɛkɛ]) is a female polar bear who was born in captivity at the Nuremberg Zoo in Nuremberg, Germany on 11 December 2007. A few weeks after her birth, she was removed from her mother's care after concerns were raised for her safety. Although the zoo had established a strict non-interference policy with its animals, officials chose to raise the cub by hand. This decision came at a time when the zoo was receiving negative attention from the media after another female polar bear reportedly ate her newly born cubs.

Like Knut, a captive-born and handraised polar bear at the Berlin Zoo, Flocke ("flake" in German) quickly became a media sensation. After she made her debut to the public on 8 April 2008, her name was trademarked by the zoo and her

image appeared on toys and in advertisements throughout the city. The zoo announced in May 2008 that United Nations Environment Program chief Achim Steiner would be Flocke's official patron with the hope of using the bear as an ambassador to encourage awareness of climate change. In late 2008, a Russian-born male polar bear named Rasputin was introduced to Flocke's enclosure in the hopes that she would gain valuable socializing skills with a member of her own species. In April 2010, both bears were relocated to Marineland in southern France.

[edit] Infancy and controversy

Flocke was born at the Nuremberg Zoo on 11 December 2007 to Vera (born 2002 in Moscow) and Felix (born 2001 in Vienna).[1] Felix also mated with Vera's sister Vilma, who gave birth some weeks earlier in November to what officials thought were two cubs. Zookeepers, enforcing a strict non-interference policy, were not able to determine exactly how many cubs were born.[2] The zoo reportedly did not wish to create a media circus similar to the one that surrounded Knut, an orphaned polar bear at the Berlin Zoo who became an international celebrity the previous year. Days after the zoo reaffirmed its non-interference policy, mass circulation daily Bild ran a story with a headline reading "Why Won't Anyone Save the Cute Baby Knuts in Nuremberg Zoo?"[4]

At the beginning of January, zoo keepers noticed that Vilma appeared nervous; she was seen agitatedly scratching at her feedbox, and there was no further sign of her cubs. It is believed that she devoured them. When asked for a reason, Nuremberg zoo director Dag Encke stated that they could have been ill, a circumstance under which polar bears in the wild often eat their young.[2] The zoo quickly faced harsh criticism throughout Germany and from the worldwide media for appearing to allow the cubs' death. The director of the German Animal Protection Society said the zoo had acted irresponsibly and that "it was the ethical responsibility of the management to give the polar bear cubs a chance of life. Using the argument 'That's Nature' as an excuse for intervening far too late is cynical and inappropriate." [4] Angry visitors gathered in front of the polar bear enclosure and shouted "Rabenmutter" (literally, "raven mother," meaning "evil mother") every time Vilma appeared.[5]

Meanwhile, Vera was seen emerging from her den for the first time; her single cub, helpless at only four weeks old, appeared to be in good health. A couple of days after the media backlash that followed Vilma's missing cubs, Vera began displaying strange behavior such as carrying her then-unnamed cub around the enclosure and repeatedly dropping it on the hard rock floor. Concerned for the cub's safety, the Nuremberg Zoo made a controversial decision to remove her from her mother's care and raise her by hand.

Less than a week after Vera's cub was removed from the polar bear enclosure, the zoo dedicated a website to the cub. It provided frequent updates on her health and development, as well as exclusive photographs and videos. The website also showcased a competition in which fans could vote for the cub's name.[6] The official name was announced on 18 January 2008 by Ulrich Maly, mayor of Nuremberg, and broadcast live on television. Despite the overwhelming number of e-mailed suggestions from across the world (including "Stella", "Knutschi", "Sissi" and "Yuki Chan"[7]), the zoo officially named her Flocke, German for "flake", as in "snowflake". "Flocke", used widely by the media previous to her official naming, was the nickname originally given to her by zookeepers because of her white fur.[8]

Flocke's growth was carefully reported by the media during her first few months. Four zookeepers took turns bottle-feeding the cub with 140 milliliters of artificial milk every four hours[9] and news of her eyes opening for the first time made headlines a few days before she was officially named.[10] At five weeks old, she was referred to by the publication Bild as "Mrs. Knut", suggesting that the two German-born polar bears might become mates when they mature.[11] As she grew, Flocke's diet was enriched with dog food, and boiled bones were supplied for her to chew on when she was three months old.[12] She was soon taken to the zoo's beginners' pool to practice her swimming skills.[12] The zoo had previously stated that they were seeking another

orphaned polar or brown bear cub to raise alongside Flocke in order to improve her development.

On 8 April 2008, Flocke made her first public appearance in the polar bear enclosure that had once been home to Vilma; the adult polar bear had been relocated to another zoo. The four-month-old cub was greeted by more than 160 journalists and a half-dozen international camera crews on the first day.[12] During the first week, Flocke was displayed for short intervals with breaks at midday. Expecting a peak of 20,000 visitors, the zoo built a viewing platform, capable of holding 500 people at a time, in front of the enclosure,[13] but attendance by zoo patrons was initially lower than expected.[14] The zoo uses a video transmission and recording system from Bosch Security Systems to transmit TV-quality live images of the cub to a pair of 46-inch (1,200 mm) large-format screens. This system, which includes one screen outside the enclosure, was implemented to help the zoo meet the demands of visitors wanting to catch a glimpse of Flocke.[15]

Shortly after her debut, however, Flocke became the focus of controversy when prominent animal conservationist Jürgen Ortmüller, chairman of the Whale and Dolphin Protection Forum, hired a lawyer to stop Nuremberg Zoo's exploitation of the polar bear cub.[16] Claiming that Flocke's public exposure would have damaging effects and that the zoo was only concerned about earning money, Ortmüller recruited high-profile lawyer Rolf Bossi to challenge them in court.[17]

[edit] Merchandising and branding

Soon after Flocke was rescued in January, the city secured branding rights to her name.[7] An official logo was subsequently released by the zoo.[18] Flocke became part of a major publicity campaign in Nuremberg when she was depicted along with the phrase "Knut war gestern" (Knut is yesterday's bear) on posters for the city's metropolitan region. These posters were displayed at numerous bus and train stops all over the city.[12]

Dubbed "Flocke fever" by the press (similar to the "Knutmania" from the previous year), the cub's popularity soared in early 2008. Her image has been used for games, diaries, soft toys, DVDs, postcards and other items.[19] The first product released, a Flocke-based board game that was released in February, was made by the Fuerth-based firm Noris-Spiele, a unit of Georg Reulein GmbH & Co. KG.[20] The well-known toy company Steiff began selling a variety of Flocke stuffed animals the following May. The income from the merchandise is currently going towards the zoo and to species survival programs.[19]

[edit] Later publicity

In April 2008, the zoo decreased human interaction with the cub, hoping that one day she could coexist with members of her species and not be dependent on humans. Becoming more independent from her keepers, Flocke was reported often playing happily on her own.[21] She was given a plastic "dummy", similar to a child's teething ring, tied to the bars on the inside of her stable door to suckle on while resting. This suckling caused the cub's nose to appear bent; her muzzle remained in this shape for some time before returning to normal.[21]

At the age of six months, it was reported that Flocke, whose diet at the time consisted mostly of a kilogram of beef, assorted vegetables and a liter of puppy milk a day, was at the correct weight for her development at 45 kilograms (99 lb). The zoo's vet, Bernhard Neurohr, also remarked upon the bear's sweet tooth, stating that "Flocke is very enthusiastic about grapes, melon, kiwi fruit and pears", with a particular fondness for bananas.[22]

United Nations Environment Program chief Achim Steiner became Flocke's official patron in May 2008.[23] By assuming this role, Steiner acknowledged Nuremberg Zoo's efforts towards local climate protection, stating "I am happy to have been asked to become 'godfather' to Nuremberg's polar bear cub Flocke. I sincerely hope that during her lifetime we will be able to implement a global green economy." [24]

In June 2008, a new poster campaign featuring Flocke was announced; its goal was strengthening public awareness of individuals' ability to protect Earth's

climate. Sponsored by the Nuremberg Zoo in conjunction with the Nuremberg Metropolitan Region, the poster showed Flocke and the phrase "Klimaschutz beginnt vor Ort" ("Climate Protection Begins At Home").[25] The zoo also published a pocket-sized brochure featuring Flocke. Entitled "Little Guide to Climate Protection", it taught visitors how to decrease their carbon dioxide emissions.[25] The Nuremberg Zoo announced in September that it had reached its one millionth visitor for 2008â ~two months earlier than last year. Although ticket sales for the year increased due to Flocke's popularity, the numbers did not match high expectations.[26] The same month it was announced that the cub, now weighing 60 kilograms (130Â lb), would no longer have lunchtime breaks in her stable, and would remain in the enclosure throughout the day.[27]

[edit] Rasputin and move to France

In late November 2008, Flocke's mother Vera gave birth to two cubs, who were fathered by Flocke's father, Felix. Although Vera was able to care for the new cubs without assistance from zoo keepers, Director Dag Encke initially stated that the cubs had a 50 percent chance of survival.[28] Three weeks after their birth was reported, both cubs died of natural causes within one week of each other. Encke expressed regret after the second cub's death, stating that "Vera nursed regularly and the young animal always slept well afterwards, so it seemed certain that it received enough milk. The reason that the young animal wasted away so quickly is not known." [29]

A male polar bear cub named Rasputin was relocated from Moscow to the Nuremberg Zoo in December 2008 for what was thought to be an extended stay before his permanent move to the Zoo Aquarium de Madrid. Originally meant to remain in Germany for only a year, the male bearâ ~called "Raspi" by fansâ ~shared Flocke's enclosure. The zoo hoped that Rasputin, who unlike Flocke was raised by his mother, would teach their celebrity bear how to interact with those of her own species. According to a statement given by the city, the bears "get along famously".[30]

On 21 October 2009, the city of Nuremberg announced that Flocke and Rasputin would move together to a newly constructed enclosure at Marineland, located in Antibes, France, at the beginning of 2010.[30] Due to the close relationship between the two adolescent bears, officials from the European Conservation Breeding Program (EuropÃischen Erhaltungszucht-Programms, or "EEP") decided that the two bears should remain together despite earlier plans for Rasputin to relocate to Madrid alone. The enclosure they are vacating in Nuremberg will be utilized by Flocke's parents, Vera and Felix, in the hopes that they will produce more cubs.[31] Despite last minute efforts by the animal right's group PETA to halt the move based on concerns for Flocke and Rasputin's well-being, the two bears arrived safely in France on 22 April 2010.[32]

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[edit] External links

The Wonderbra is a type of push-up underwire brassiere that gained worldwide prominence in the 1990s. Although the Wonderbra name was first trademarked in the U.S. in 1935,[1] the brand was developed in Canada. Moses (Moe) Nadler, founder and majority owner of the Canadian Lady Corset Company, licensed the trademark for the Canadian market in 1939. By the 1960s the Canadian Lady brand had become known in Canada as "Wonderbra, the company." In 1961 the company introduced the Model 1300 plunge push-up bra. This bra became one of the best-selling Canadian styles and is virtually identical to today's Wonderbra.

In 1968, Canadian Lady changed its name to Canadian Lady-Canadelle Inc., was sold to Consolidated Foods (now Sara Lee Corporation), and later became Canadelle Inc. During the 1970s Wonderbra was repositioned as the company's fashionable and sexy brand, and became the Canadian market leader.[2]

In 1991, the push-up Wonderbra became a sensation in the UK, although it had been sold there since 1964 under license by the Gossard division of Courtaulds Textiles. Sara Lee Corporation did not renew Gossard's license and redesigned the push-up style for the reintroduction of the Wonderbra to the U.S. market in 1994.[3]

Since 1994, the Wonderbra has expanded from the single push-up design into a full-range lingerie fashion label in most of the world. In most countries, the brand emphasizes sex-appeal. In its native Canada, however, the brand promotes the functional qualities of its productsâ a departure from the strategy that made Wonderbra the top-seller in the 1970s.[4]

[edit] Original "Wonder-Bra" design

Before the Second World War broke out, elastic materials were rationed and unavailable for clothing. Israel Pilot designed an improved cup with a diagonal slash, shoulder strap attachment. This innovation on existing bra design provided more comfort and freedom of movement for the wearer.[5] He also coined the name "Wonder-Bra" in 1935.[6]

Israel Pilot's patent US 2245413Â , granted in 1941, allowed for greater shoulder strap elasticity by cutting the fabric so that the weave has the

greatest stretch (cutting on the "bias"). The photographs show the original patent sketches and close-ups of a bra made in the U.S. by D'Amour. The model is wearing a rare 1950s version of this original Wonder-Bra design.

[edit] History

In 1939, Moe Nadler founded the Canadian Lady Corset Company. He created a small sewing shop in the heart of Montreal to make a well fitting, good quality bra in the mid-priced range (from \$1.00 to \$1.50 retail). As part of this effort, he traveled to New York City and met with Israel Pilot and licensed the Wonder-Bra trademark and diagonal slash patent.[6] In Canada, the trademark lost the hyphen, and became "WonderBra," and "Wonderbra" at the U.S. reintroduction.

During the wartime years, Canadian apparel manufacturers were subject to quotas on materials. Elastics were unavailable, affecting the comfort and design of women's underwear. The diagonal slash offered a better fitting brassiere without elastics, and became a competitive advantage.[6]

From 1939 - 1955, Canadian Lady marketed several lines of intimate apparel including girdles, panties, slips, swimsuits, and brassieres under the Wonderbra brand. The Company also created sub-brands to target different socioeconomic and lifestyle segments of the consumer market. In contrast, the U.S. market for Wonder-Bra stagnated while the brand was owned by Israel Pilot's companies. In 1952, Canadian Lady launched Petal Burst with anticipation of tough negotiations with D'Amour's Israel Pilot's U.S. company's around the expiration of the patent in 1955. This new line also adapted to a new fashion trend towards a pointed bust, inspired by Christian Dior's "New Look". The Petal Burst by Wonderbra line was successful and delivered 50% of bra sales by 1957.[7]

The post-patent negotiations were led by Moe Nadler. D'Amour no longer had leverage with a patent, but still demanded that Canadian Lady stop using the designs, and return the pattern templates. Moe Nadler ignored this demand and instead successfully acquired the Canadian, European, and Asian rights to the Wonderbra trademarks. This allowed the company to move forward into the 1960s with the brand intact. By the mid 1960s Canadian Lady was exporting and licensing the Wonderbra line to Western Europe, Australia, South Africa, Israel and the West Indies.[8] In the 1970s, Canadelle acquired the remaining worldwide rights to the trademark, and licensed Giltex (a Canadian pantyhose manufacturer acquired by Sara Lee in the 1980s) to use the Wonderbra brand on hosiery in Canada.

[edit] Development of the push-up bra

In the late 1950s Moe Nadler started traveling to Europe to find new styles to bring to the Canadian market. In 1960, Wonderbra introduced a lacy, half push-up bra described in Europe as Pigeonnant (meaning "pigeon-breasted" in French). In 1961 Nadler directed Louise Poirier to develop a deeply plunged, laced push-up design, numbered the 1300. Canadian Lady licensed these models, among others, to Gossard in 1964. It was this Wonderbra Model 1300 design that became first a UK success in the early 1990s, a European sensation in 1993, and then the "One and Only Wonderbra" that was finally launched in the U.S. in 1994.[9]

[edit] Canadian product, 1964 to 1980

In the late 1950s and early 1960s, the majority of women were still wearing highly-structured undergarments.[10] Girdles were considered the ladylike norm and represented close to 40% of industry sales by volume. The 1960s also brought to Canadian Lady the challenges of feminism, fashions and the sexual revolution. The feminist movement's cultured by thought leaders like Betty Friedan and Germaine Greer's questioned the mores that defined women's roles and appearance. Changes in fashion trends, such as pantyhose and the rise of the miniskirt, rendered the girdle unattractive and obsolete to a generation of women.[11] While the intimate apparel industry fretted about bra-burning as a precursor to the decline of all foundation garment sales, women reserved their animosity for their girdles. The Canadian sales data for foundation undergarments, from 1960 to 1971, vividly demonstrates the shift in tastes.

It was against this backdrop that the Canadian Lady Corset Company had to act. In 1964, Moe Nadler died and his son, Larry Nadler inherited control of the company.[12] Larry Nadler was a Harvard-trained MBA and brought modern marketing strategies to the industry.[13] He commissioned market research that identified women's feelings about intimate apparel. Women did not hate their bras. Rather, they saw bras as a means to feel and look beautiful, to be fashionable and sexy, and to attract men. While women sometimes went bra-less, they were making a fashion choice and not a political statement. Canadian Lady's management knew that girdles were out, but bras would remain an essential part of women's wardrobes. So during the 1960s, while competitors were cutting back on their bra marketing and diversifying into other products, Canadian Lady aggressively pursued bra market share.[14]

Later, Larry Nadler identified an age based bifurcation in the market. Younger women (aged 15 to 20) regarded their bras as an enhancement to their sexuality but were not interested in a heavily structured garment.[15] Nadler learned that women wanted "less bra," not "no bra." [14] In 1974, they introduced a new line of brassieres for teens called Dici (by Wonderbra), and invented new hot fabric molding technologies to shape the cup.[16] These bras were seamless and simply designed with less support than the typical bra of the period. The company designed special packaging in the shape of a die (with holes).[17]

[edit] Brand development

In 1966, Canadian Lady made several important changes to their advertising strategy. They introduced television advertising and changed the emphasis from the product to the brand. Ads attempted to build consumer awareness of the single brand name: Wonderbra. Market research showed that women did not want girdles advertised on televisionâ ~girdles were seen as armor against sex, while bras provided a means of attraction.[18]

Our Montreal office got the Wonderbra account. This was a Canadian company which held down the Number Two position in women's garmentwear. One of our copywriters came up with the line: "We care about the shape you're in." Larry Nadler, who headed the family business, was a risk-taker. He loved the line and so did we. We had it set to music and prepared a television campaign around it. The CBC turned it down, not because of the line, but because we had the audacity to show a woman in a bra. CTV had no such qualms, which proves how arbitrary the world can be. Eventually, the CBC recanted and ran the campaign. The result of the campaignâ ~not just in TV, but other media as wellâ ~moved Wonderbra into a solid, first-place position in its field.[19]

- Gerry Goodis, former CEO, Goodis Advertising

Instead of being hidden "unmentionables", Wonderbras became more visible icons of female sex-appeal. The company also used pricing to promote Wonderbra as a luxury product with the highest price of any mass-merchandised brand. This strategy also provided greater profits in a very competitive industry. The goal was to have women see their Wonderbras as a cosmeticâ ~a beauty enhancerâ ~rather than a functional garment. Playtex, the leading brand at the time, promoted the ease of care and durability of their girdles and brassieres.

Beginning in 1967, the advertising focused exclusively on Wonderbra brand brassieres.[18] In 1968, Nadler hired Goodis Advertising to develop the new campaign. The Wonderbra ads were based on fashion and emotional appeal. In various ads, the man would appear as fashion photographer (in a fashion shoot) or fashion buyer (at a fashion show).[21] The storyline suggested an attraction or budding romance between the man and the women. The voice-over and jingle featured a man's voice and the commercial showed an actual woman's torso naked except for a bra. All other television ads before this era showed brassieres on a manikin or a dressmaker's dummy to promote the functional features of the product. Every Wonderbra advertisement contained versions of the musical theme, "We care about the shape you're in. Wonderful, wonderful, Wonderbra".[22] The 1979 television campaign included a commercial directed by Richard Avedon which won a Silver award for television advertisements shown in Canada.[23]

The Dici by Wonderbra television advertisements started in 1974.[24] The brand was positioned to young women as a more natural alternative to the heavily-structured bras worn by their mothers. The animated ads featured the iconic die-shaped packaging. A bra exited the box like a bird, then metamorphosed into a seagull and flew away. The tagline reinforced a spirit of freedom and nature: "Let it be Dici. Dici or nothing."

[edit] Popularity in Canada

From 1972 to 1977, the company doubled its wholesale revenue from \$12.6 million to \$24.9 million.[2] By 1979 Canadelle dominated with 30% of the Canadian market and \$27 million in sales. Playtex (later acquired by Sara Lee) was second.[25] By 1980, Wonderbra's sales were over \$30 million wholesale (\$76 million in 2006 dollars) in a country with only 10.3 million women and girls older than 13.[26]

[edit] Worldwide reintroduction, 1991 to 1994

"I've got a couple of those Gossard Wonderbras. They are so brilliant, I swear, even I get cleavage with them."[27]

â ^ Kate Moss, 1994, New York Times Magazine

Around 1991, Gossard was selling the Wonderbra lines under licenses that were to expire in January 1994. At the time, the plunge style was a good seller in the UK market. Gossard planned to renew their license and had an option to do so under the existing agreement. Instead of simply renewing the agreement, Gossard executives decided to negotiate better terms with Sara Lee.

Soon after the negotiations started, something unexpected happened. In 1992, the plunge style became a hit with British women and sales took off. Between 1991 and 1993, UK sales of that Wonderbra style quadrupled to \$28 million, accounting for 12.5% of the \$225 million UK branded bra market. Several factors might have contributed to this boom including "an article in British Vogue on the return of the padded bra, a Vivienne Westwood-inspired fad for corsetry and that Gaultier driven yearning for underwear as outerwear".[3] With this surge in sales, Sara Lee decided not to renew the license with Gossard.[15]

In 1994 in the UK, the (Sara Lee) Wonderbra achieved a high profile for its racy Hello Boys campaign. The most famous campaign poster presented model Eva Herzigová; in a Wonderbra gazing down at her breasts with the caption "Hello Boys", ambiguously addressing either male admirers or her breasts.[28][29] Urban myth attributed a number of car accidents to (male) drivers being distracted by the advertisements.[30] The influential poster was featured in an exhibition at the Victoria and Albert Museum in London[31] and it was voted in at number 10 in a "Poster of the Century" contest.[32]

The Playtex Division of Sara Lee was given the responsibility of introducing "The Wonderbra" style to the United States. Although the model was already being manufactured in Montreal by Canadelle, Playtex executives decided to take a year to redesign the bra for the U.S. market. They scheduled a late 1994 national launch for the bra. During this period, Gossard introduced to Americans their Ultrabra, with a design similar to the push-up Wonderbra model.[3][27] Other competitors quickly followed while Playtex retooled the design. Victoria's Secret launched television advertisements to maintain visibility for the Miracle Bra which the company launched in 1993.[33]

The U.S. Wonderbra rollout included events with Eva Herzigová; in New York's Times Square. The advertisements were toned down in comparison to the earlier UK campaign.[34] The U.S. print and billboard advertising showed models wearing only the Wonderbra. Underneath read slogans such as "who cares if it's a bad hair day" and "look me in the eyes and tell me that you love me." [34] The \$25 Million campaign worked in conjunction to the ongoing media interest in the bra. Although Playtex promoted the authenticity of their "One and Only Wonderbra", the rapid introduction of competitive products meant that the overall U.S. market benefited from a 43% increase in push-up bra sales by the end of 1994.[34]

Following the 1994 relaunch, the U.S. Wonderbra has expanded from the single

push-up bra design to a broader lingerie line. The brand remains popular around the world as a product, and a part of the cultural lexicon.[34][35]

[edit] Recent developments

In 2006, Sara Lee sold its intimate apparel brands. The Wonderbra trademark is the property of Canadelle Limited Partnership of Canada, which is a wholly owned subsidiary of HanesBrands Inc. HanesBrands Inc. owns the license to sell and distribute apparel products under the Wonderbra trademark in all countries except the member states of the European Union, several other European nations and South Africa; in these other markets, an affiliate of Sun Capital Partners owns the license under the Dim Branded Apparel group which is headquartered in Paris.[36][37]

On January 3, 2007, the Canadian Broadcasting Corporation (CBC-TV) broadcasted the results of their internet poll, in which Canadian respondents ranked the Wonderbra 5th out of the top 50 "Greatest Canadian Inventions" (after Insulin, the light bulb and the telephone, but ahead of the pacemaker).[38]

In a March 2008 survey of 3,000 UK women, the Wonderbra was reported as the greatest fashion innovation in history. According to one magazine article, survey respondents were nearly unanimous in giving push-up bras the number one position.[39]

In 2009, WonderBra Canada celebrated the 70th anniversary of the brand's Canadian introduction.[40]

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[edit] External links

1960s - 1970s Canadian Wonderbra Television Ads

The 2007â ^2008 Nazko earthquakes were a series of small volcanic earthquakes measuring less than 4.0Â on the Richter magnitude scale. They took place in the sparsely populated Nazko area of the Central Interior of British Columbia, Canada starting on October 9, 2007 and ending on June 12, 2008. They occurred just west of Nazko Cone, a small tree-covered cinder cone that last erupted about 7,200Â years ago.

No damage or casualties resulted from the Nazko earthquakes, which were too small to be felt by people, but local seismographs recorded them. The earthquake swarm occurred at the eastern end of a known volcanic zone called the Anahim Volcanic Belt. This is an east-west trending line of volcanic formations extending from the Central Coast to the Central Interior of British Columbia.

[edit] Geology

The 2007â ^2008 Nazko earthquake swarm is interpreted to have originated 25Â km (16Â mi) below the surface. The character of the seismic waves indicated that the swarm originated from a magmatic source. It could have formed as a result of rock fracturing at the tip of a dike and/or by movement along fault planes due to changes in the local stress field by the expansion and movement of magma.[1] This magmatic activity is potentially linked to the hypothesized Anahim hotspot, a mantle plume that is probably responsible for older volcanism throughout the Anahim Volcanic Belt.[2] This volcanic belt includes the Rainbow, Ilgachuz and Itcha range shield volcanoes west of the Nazko swarm.[3] Individual Anahim volcanoes generally become older to the west of the Nazko swarm, indicating that the North American Plate is moving in a westerly direction with respect to the hotspot, carrying the volcanoes along with it at a rate of 2Â cm (0.79Â in) to 3.3Â cm (33Â mm) per year.[4] Because the area where the 2007â ^2008 Nazko earthquake swarm originated is at the eastern end of the volcanic belt, it probably represents the youngest portion of the hotspot track. This suggests any future volcanic earthquakes will occur in the Nazko region or further to the east.[3]

Before the Nazko earthquake swarm began in 2007, the Anahim hotspot was not known to be an earthquake zone. On October 10 of the following year, a swarm of earthquakes occurred. These earthquakes were normally no more than magnitude 1.0Â on the Richter magnitude scale, but at least one earthquake was as strong as magnitude 3.9. Since the appearance of the Nazko swarm, Natural Resources Canada has expressed interest in the adjacent 7,200Â year old Nazko Cone.[5]

Even though earthquake swarms can be dangerous, scientists are able to model such events to analyze their structure.[5] During the earthquake swarm in 2007, a group of scientists investigated the possibility that a volcanic eruption would occur. Five additional seismographs were placed in the earthquake zone, and scientists closely monitored the seismic activity. After additional data were gathered, scientists with the United States Geological Survey, the University of Washington, and other organizations, agreed that the Nazko earthquakes probably originated from movement of magma beneath the surface near

Nazko Cone.[6] However, because of the number and small size of the Nazko earthquakes, no volcanic eruption is likely. Other recent earthquakes in North America that have been attributed to magma but did not result in a volcanic eruption include the 2003 earthquakes under Lake Tahoe in the U.S. state of California and a 2004 earthquake swarm at Jordan Craters in the U.S. state of Oregon.[7]

[edit] Number of earthquakes

More than 1,000 earthquakes were recorded by regional seismic networks within three weeks of October 20, 2007. Because the seismometers that recorded the Nazko swarm were more than 25 km (16 mi) away from where the earthquakes took place, the locations of the hypocenters were measured with poor resolution. Following the earthquake, five seismometers were placed by the Geological Survey of Canada from September 2007 to June 2008 close to the hypocenter.[1] Analysis of the data recorded by these seismometers indicates a much larger total number of earthquakes. For example, at least 597 earthquakes were recognized during a period of only six hours.[7]

At least two episodes of earthquakes constitute the Nazko swarm. In the first seismic phase from October 29 to November 1, 2007, a total of 153 earthquakes took place. During the second seismic phase between September 25, 2007 and June 12, 2008, 4,428 earthquakes occurred. These two seismic episodes were cross-correlated by scientists to understand changes in the development of the earthquake swarm. Correlation coefficients were around 1.0 for the beginnings of the periods of activity, indicating almost identical situations, and then decayed to around 0.5, indicating a decrease in similarity between the later stages of the two events.[1]

[edit] Scientific response

The earthquake swarm was noted on October 12, 2007 in the Prince George Citizen by citizen staff, three days after the earthquakes began. Scientists mentioned in the report were seismologist John Cassidy of Natural Resources Canada and volcanologist Catherine Hickson, who was part of the Geological Survey of Canada at the time. At the time of the report, scientists did not know the origin of the swarm. Seismologist John Cassidy stated, "the depth is enough to rule out hydrothermal but it's up in the air as to whether the cause is tectonic shifts or volcanic activity. If it is volcanic there are certain characteristics that we would expect, there's a tremor-like character to it. And so we'll be looking for the types of events that we see beneath volcanoes and we'll be looking to see if they're getting closer to the surface or if they're migrating at all." [8]

Even if the Nazko swarm were a warning of a volcanic eruption, Hickson doubted it would turn out to be a highly explosive eruption like those that can occur in subduction-zone volcanoes. "We're not talking about an injection of tonnes of ash many kilometers into the air like the 1980 Mount St. Helens eruption or the 1991 Mount Pinatubo eruption. We're talking about something very small, relatively localized that should have a fairly limited impact...but it'll be extremely exciting," Hickson said. If an eruption were to occur, Hickson suggested that it would be characterized by a lava fountain that sends globs of lava 100 m (330 ft) into the air. This is similar to those that occur in Hawaii. Hickson said that a Nazko eruption could be a tourist attraction, but warned that noxious gases such as carbon dioxide and sulfur dioxide would be released during the event.[8]

[edit] Preparedness and hazards

Because no seismographs were close enough to the Nazko swarm zone before the earthquakes began, employees of Natural Resources Canada placed seismographs in the area to monitor future earthquakes in the area more clearly. An infrasound station is also being established, which is able to measure sound waves that would normally go unnoticed by human hearing.[7] These stations can detect volcanic eruptions and the release of gas at volcanic vents, and can be used in combination with other geophysical data to monitor fluid flow within volcanoes.[9] Employees of Natural Resources Canada have also visited two communities that were adjacent to the 2007-2008 earthquake swarm to renew

information about the Nazko swarm, collect samples, and examine some of the more poorly studied volcanic deposits in the Nazko region. The Natural Resources Canada employees also measured carbon dioxide levels during the earthquake swarm. Carbon dioxide is usually discharged at faults in volcanically active areas and can collect in soil and under snow. Because of this, carbon dioxide concentrations can provide information on volcanic activity in the subsurface. The Nazko swarm did not cause any discernible discharge of carbon dioxide, which is normal for non-eruptive events.[7]

The 2007-2008 Nazko earthquake swarm is one of numerous seismic events that have occurred near volcanoes in British Columbia. Volcanoes that have experienced volcanic earthquakes include Mount Meager (seventeen events), Mount Cayley (four events), Mount Garibaldi (three events), Silverthorne Caldera (two events), Castle Rock (two events), Hoodoo Mountain (eight events), Crow Lagoon (four events), The Volcano (five events), and the Mount Edziza volcanic complex (eight events).[10] Seismic data suggest that these volcanoes still contain active magma chambers, indicating possible future eruptive activity.[11] Although the available data do not allow a clear conclusion, these observations are indications that some of Canada's volcanoes may be active, with significant potential dangers. This seismic activity correlates both with some of Canada's most youthful volcanoes and with long-lived volcanoes with a history of significant explosive activity, such as Hoodoo Mountain and the Mount Edziza volcanic complex.[10]

If magma were to rise towards the surface of Nazko, new earthquake swarms would occur, with a significant increase in the size and number of earthquakes. An eruption in the Nazko area would probably create a small cinder cone, similar to what formed Nazko Cone 7,200 years ago. Immediate hazards related to cinder cone eruptions in the Nazko area would probably be forest fires and, if an eruption column were produced, redirection of nearby air traffic.[7]

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[edit] External links

2007–2008 Nazko (<4.0)

Alum Rock (5.6, Oct 30)

Aisne Fjord (6.7, Apr 21)

Andreanof Islands (7.2, Dec 19)

Tocopilla (7.7, Nov 14)

Chukotsk offshore (6.6, Jul 16)

Emery County (USA) (3.9, Aug 6)

Gisborne (6.8, Dec 20)

Guatemala (6.7, Jun 13)

Iberian Peninsula (6.1, Feb 12)

Kent (4.3, Apr 28)

Kuril Islands (8.1, Jan 13)

Laos (6.1, May 16)

Martinique (7.4, Nov 29)

Noto (6.9, Mar 25)

Peru (8.0, Aug 15)

Solomon Islands (8.1, Apr 2)

1st Sumatra (6.4, Mar 6)

2nd Sumatra (8.5, Sep 12)

Mariana Islands (7.2, Oct 31)

Tonga (7.9, Dec 9)

Puchuncaví (6.7, Dec 15)

^ indicates earthquake resulting at least 30 deaths ; indicates the deadliest earthquake of the year

2007–2008 Nazko (<4.0)

Lake Kivu (5.9, Feb 3)

Ål (4.5, Feb 15)

Lincolnshire (5.2, Feb 27)

Illinois (5.4, Apr 18)

Sichuan (8.0, May 12)

El Calvario (5.9, May 24)

Iceland (6.3, May 29)

Peloponnese (6.5, Jun 8)

Iwate (7.2, Jun 14)

Dodecanese (6.4, Jul 15)

Chino Hills (5.5, Jul 29)

Yingjiang (6.0, Aug 21)

Panzhihua (~6, Aug 30)

Bandar Abbas (6.1, Sep 10)

Kyrgyzstan (6.6, Oct 5)

Damxung (6.4, Oct 6)

Chechnya (5.8, Oct 11)

Pakistan (6.4, Oct 29)

Sulawesi (7.3, Nov 16)

Moravian–Silesian (4.1, Nov 22)

Skane County (4.3, Dec 16)

Papudo (6.8, Dec 18)

Parma (5.2, Dec 28)

â indicates earthquake resulting at least 30 deathsâ ; indicates the deadliest earthquake of the year

Fantastic Adventures was an American pulp science fiction magazine, published from 1939 to 1953 by Ziff-Davis. It was initially edited by Ray Palmer, who was also the editor of Amazing Stories, Ziff-Davis's other science fiction title. The first nine issues were in bedsheet format, but in June 1940 it switched to a standard pulp size. It was almost cancelled at the end of 1940, but the October 1940 issue had unexpectedly good sales, helped by a strong cover by J. Allen St. John for Robert Moore Williams' Jongor of Lost Land. By May 1941 the magazine was on a regular monthly schedule. Historians of science fiction consider that Palmer was unable to maintain a consistently high standard of fiction, but Fantastic Adventures soon developed a reputation for light-hearted and whimsical stories. Much of the material was written by a small group of writers under both their own names and house names. The cover art, like those of many other pulps of the era, focused on beautiful women in melodramatic action scenes. One regular cover artist was H.W. McCauley, whose glamorous "MacGirl" covers were popular with the readers, though the emphasis on depictions of attractive and often partly clothed women did draw some objections from readers.

In 1949 Palmer left Ziff-Davis and was replaced by Howard Browne, who was knowledgeable and enthusiastic about fantasy fiction. Browne briefly managed to improve the quality of the fiction in Fantastic Adventures, and the period around 1951 has been described as the magazine's heyday. Browne lost interest when his plan to take Amazing Stories upmarket collapsed, however, and the magazine fell back into predictability. In 1952, Ziff-Davis launched another fantasy magazine, titled Fantastic, in a digest format; it was successful, and within a few months the decision was taken to end Fantastic Adventures in favor of Fantastic. The March 1953 issue of Fantastic Adventures was the last.

[edit] Publication history

Although science fiction (sf) had been published before the 1920s, it did not begin to coalesce into a separately marketed genre until the appearance in 1926 of Amazing Stories, a pulp magazine published by Hugo Gernsback. By the end of the 1930s the field was undergoing its first boom.[1] Gernsback lost control of Amazing Stories in 1929; it was sold to Teck Publications, and then in 1938 it was acquired by Ziff-Davis.[2][3] The following year Ziff-Davis launched Fantastic Adventures as a companion to Amazing; the first issue was dated May 1939, and the editor of Amazing, Ray Palmer, took on responsibility for the new magazine as well.[4]

Fantastic Adventures was initially published in bedsheet format,[note 1] the same size as the early sf magazines such as Amazing,[6][7] perhaps in order to attract fans who were nostalgic for the larger format.[8] It started as a bimonthly, but in January 1940 began a monthly schedule. Sales were weaker than for Amazing, however, and with the June issue the schedule reverted to bimonthly again. The size was also reduced to a standard pulp format, since that was cheaper to produce. Sales did not improve, and Ziff-Davis planned to make the October issue the last one. That issue carried Robert Moore Williams' Jongor of Lost Land, and had an attractive cover by J. Allen St. John; the combination proved to be so popular that October sales were twice the August figures. This convinced Ziff-Davis that the magazine was viable, and it was restarted in January 1941â ~as a bimonthly at first, but switching to monthly again in May of that year.[4][8]

Howard Browne took over as editor of both Amazing Stories and Fantastic Adventures in 1950. Browne preferred fantasy to science fiction, and enjoyed editing Fantastic Adventures, but when his plans for taking Amazing upmarket were derailed by the Korean War, he lost interest in both magazines for a while.[9][10] He let William Hamling take responsibility for both titles, and

the quality declined. At the end of 1950 Ziff-Davis moved its offices from Chicago to New York; Browne relocated to New York, but Hamling decided to stay in Chicago, so Browne became more involved once again, and sf historians such as Brian Stableford and Mike Ashley consider the result to have been a definite improvement in quality.[7][9] Browne's interest in fantasy led him to start a new digest-sized magazine *Fantastic* in the summer of 1952; it was an immediate success, and led Ziff-Davis to convert *Amazing Stories* to digest format as well. The move away from the pulp format to digests was well under way in the early 1950s, and with *Fantastic*'s success there was little reason to keep *Fantastic Adventures* going. It was merged with *Fantastic*; the last issue was dated March 1953, and the May-June issue of *Fantastic* added a mention of *Fantastic Adventures* to the masthead, though this disappeared with the following issue.[10]

[edit] Contents and reception

[edit] Palmer

Palmer's goal for *Fantastic Adventures* was to create a magazine which published fantasy fiction but was the literary equal of the quality magazines—the "slicks", such as *The Saturday Evening Post*. [4] Although mixing science fiction with fantasy was not popular with sf fans of the era, Palmer consciously promoted the magazine as containing the best of both worlds: the slogan on the cover read "The Best in Science Fiction", but Palmer also wrote blurbs in *Amazing Stories* for *Fantastic Adventures* in which he extolled the value to a reader of getting both genres in a single magazine.[8] *Fantastic Adventures*' competition included *Unknown*, which had been launched just a couple of months earlier, in March 1939, and *Weird Tales*, which was first published in 1923; but instead of attempting to emulate either one, *Fantastic Adventures* focused on adventure stories in the style of Edgar Rice Burroughs. Palmer probably acquired some fantasy-oriented material that had been submitted to *Amazing Stories*, which gave him an immediate stream of submissions to work with.[4] However, according to Ashley the first issue was quite weak: the cover story was "The Invisible Robinhood" by Eando Binder, and other contributors included Harl Vincent, Ross Rocklynne and A. Hyatt Verrill.[4][11] Features included a quiz, an author profile, and a comic strip, titled "Ray Holmes, Scientific Detective"; the reader was supposed to solve the mystery based on the clues given in the strip. It was a failure and disappeared after the first issue.[8] The back cover, "The Man from Mars", by Frank R. Paul, was more successful,[4] and illustrated back covers became a regular feature of the magazine.[8]

The next issue contained "The Scientists' Revolt", by Edgar Rice Burroughs, a name guaranteed to help sales. Ashley comments that the story was unimpressive; it had been written as a palace intrigue set in contemporary Europe, but Burroughs had been unable to find a buyer. Palmer eventually acquired it, and rewrote it, setting it in the future. Despite the weakness of the lead story, the second issue was a marked improvement over the first, with well-received stories by Nelson S. Bond and John Russell Fearn (as "Thornton Ayre").[8] Burroughs returned to *Fantastic Adventures* in 1941, with a series of novelettes in his Carson of Venus series; there were four in all between March 1941 and March 1942, each with cover art by J. Allen St. John, and the result was a significant boost to *Fantastic Adventures*' circulation.[8]

A majority of the stories in *Fantastic Adventures* came from a small group of writers who often wrote under house names. The main members of the group were William P. McGivern, David Wright O'Brien, Don Wilcox, Chester S. Geier, Rog Phillips, Leroy Yerxa, Robert Moore Williams, Robert Bloch and Berkeley Livingston.[8][12] Most of this material was of little lasting value, in Ashley's opinion, but Palmer was often able to get good stories from outside this group: August Derleth sold several stories to Palmer, for example. Ray Bradbury also sold a story to *Fantastic Adventures*—"Tomorrow and Tomorrow", which appeared in 1947, was his only appearance in the magazine, but Ashley regards it as "among the best stories [*Fantastic Adventures*] published in the 1940s".[8] An early contributor was Nelson S. Bond, whose story "The Judging of

the Priestess" appeared in the April 1940 issue. This was the second in a highly regarded series of three stories about a priestess in the future, after civilization has collapsed; the first and third in the series appeared in *Amazing Stories* and *Astounding Stories* respectively.[4] Bond also wrote a humorous short story called "The Amazing Invention of Wilberforce Weems", which appeared in the September 1939 issue and described the consequences of a potion that allowed the instant absorption of knowledge from any book. Palmer encouraged his stable of writers to follow up with more whimsical ideas, and the resulting offbeat stories gave *Fantastic Adventures* a reputation for light-hearted and entertaining fantasy.[4] These stories often had absurd names; early examples include "The Quandary of Quantus Quaggle", "Sidney, the Screwloose Robot" (both by McGivern), and "The Weird Doom of Floyd Scrilch", by Robert Bloch. One of his series of stories about Lefty Feep, almost all of which appeared in *Fantastic Adventures* between 1942 and 1945.[4] Robert Moore Williams contributed two sequels to his successful *Jongor of Lost Land*: *The Return of Jongor* appeared in 1944, and *Jongor Fights Back* in 1951.[8]

Palmer enjoyed hoaxes, such as printing a photograph of a writer when in fact the name in question was a pseudonym. In the February 1944 issue of *Fantastic Adventures* he printed a letter in which the writer claimed to be a time-traveling scientist born in 1970, whose time machine was inspired by a story in the magazine. Palmer pretended to take it seriously, and printed an appeal to readers to find the scientist.[13] Palmer's most successful hoax was the "Shaver Mystery", a series of stories in which the author, Richard Shaver, explained all the wrecks and accidents on Earth as the result of interference by ancient machinery hidden underground. The series was enormously popular; all the Shaver Mystery stories were published in *Fantastic Adventures'* companion magazine, *Amazing Stories* (which led Ashley to describe *Fantastic Adventures* as a "haven" from the Shaver stories) but Shaver did also publish some competent fantasies in *Fantastic Adventures*. [8][13][14] The increased circulation enabled both *Amazing* and *Fantastic Adventures* to return to monthly publication in the late 1940s.[15]

[edit] Browne

When Browne took over at the start of 1950, William Hamling was doing most of the editorial work. Browne did not fully take control of the magazine until the end of the year, when Hamling and Palmer both left Ziff-Davis; the quality of the fiction promptly improved at that point, and the first year or two of Browne's tenure are regarded as the high point of *Fantastic Adventures'* run.[7][8] Theodore Sturgeon's novel *The Dreaming Jewels* appeared in February 1950, and Lester del Rey, William Tenn and Walter M. Miller all published notable material.[7] In April 1950, Mack Reynolds' first story, "Isolationist", appeared in *Fantastic Adventures*. Reynolds became more strongly associated with *Astounding Science Fiction* than with the Ziff-Davis magazines, but some of the radical political themes of his later work are evident in "Isolationist". The story describes helpful alien visitors abandoning Earth to atomic war because of the hostility of the first Earthman they encounter.[17] John Jakes also debuted in *Fantastic Adventures* that year, with "The Dreaming Trees", in November 1950.[8]

Overall the quality was low, but according to sf historian Brian Stableford, "sf writers given carte blanche to write pure fantasy for [*Fantastic Adventures*] did often produce readable fiction with a distinctive whimsical and ironic flavour".[7] Critic John Clute's assessment was that it was inconsistent, "but there were some terrific tales in it. Not enough, but some." [18] Notable stories from the post-war era include Theodore Sturgeon's "Largo" and Raymond F. Jones' "The Children's Room". The artwork was generally of higher quality than the stories; Ashley describes *Fantastic Adventures* as "one of the best-illustrated magazines around". Regular artists included Virgil Finlay, Henry Sharp, Rod Ruth, and Malcolm Smith.[8] In Palmer's words, "It has been our experience that covers sell magazines simply because they attract attention." [8] For the first year the cover art, while dramatic, was more likely to show an action scene with a male hero than a damsel in distress, but

in August 1940 H.W. McCauley's cover showed a glamorous woman in a sparkling dress. Similar covers followed with increasing frequency, with readers and editors giving the various heroines the name of "MacGirl". Science fiction historian Paul Carter, commenting on the change from action scenes to alluring women on the covers, suggests that "surely the war had something to do with this".[19] Science fiction art often included spaceships as phallic symbols; author and critic Brian Aldiss remarked on a Fantastic Adventures cover, from March 1949, that included a submarine as a phallic symbol instead.[16] Readers' letters often objected to the attractive women and the implied sexual content, but the stories themselves were quite tame.[8]

[edit] Bibliographic details

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Issues of Fantastic Adventures, showing volume/issue number, and color-coded to show who was editor for each issue. The editor was Raymond Palmer from the beginning until the end of 1949; Howard Browne took over in January 1950 and remained in that role till the magazine folded.

The editorial succession at Fantastic Adventures is usually given as follows:[7][8]

However, the editorial responsibility did not always reside with the named editor on the masthead. The editor-in-chief was senior to the managing editor, but at some points in the magazine's history it was the managing editor who was primarily responsible for the magazine. The following table shows who held which title, at which point:[8]

Start month

End month

Editor-in-Chief
Managing Editor
Number of issues
Mayâ ^39
Janâ ^47
B.G. Davis
Ray Palmer
59
Marâ ^47
Octâ ^47
Ray Palmer
Howard Browne
5
Novâ ^47
Decâ ^49
William Hamling
26
Janâ ^50
Febâ ^51
Howard Browne
14
Marâ ^51
Marâ ^53
Lila Shaffer
25

Fantastic was initially bedsheet-sized and had a page count of 96, which increased to 144 when the publication was reduced to pulp-size in June 1940. It was initially priced at 20 cents. With the April 1942 issue the price increased to 25 cents, where it remained for the rest of the magazine's run, and the page count went up again to 240. From June 1943 to July 1945 there were 208 pages, and the count dropped to 176 with the October 1945 issue; then to 160 in July 1948, and only two issues later, in September 1948, the page count went down to 156. It dropped again to 144 with the June 1949 issue, but rose to 160 from September 1949 to August 1950. The September 1950 issue had 148 pages, and all the remaining issues had 130 pages.[8]

The magazine began as a bimonthly, but switched to a monthly schedule in January 1940, though this only lasted six issues. June 1940 was followed by August and October 1940 and January and March 1941. The May 1941 issue inaugurated another monthly period that lasted until August 1943, when the schedule switched back to bimonthly until the June 1944 issue. Fantastic then went on a quarterly schedule, beginning with the October 1944 issue; in October 1945 it became bimonthly again, though there was a gap between February and May 1946. From September 1947 to the end of the run the magazine was monthly. The volume numeration was regular, with a new volume starting at the beginning of each calendar year; the result was a variable number of issues in each volume, from a low of four in 1944 to a full 12 when the magazine was monthly, as it was for the last few years of its life. The last issue was volume 15 number 3.[8]

There were two British reprint editions. The first consisted of two numbered and undated issues, which appeared in May and June 1947 from Ziff-Davis in London. This was pulp-sized and 32 pages long; it contained stories from the wartime U.S. edition. The second series was published by Thorpe & Porter, in Leicester, and consisted of 24 undated issues, all but the first two of which were numbered. These began at 160 pages, and decreased, first to 128 and then to 96 pages. They were released between June 1950 and February 1954, and were abridged versions of U.S. editions dated from March 1950 to January 1953, as follows:[6][8]

Number
British release date
Corresponding U.S. issue

1 (unnumbered)
June 1950
Mar 1950
2 (unnumbered)
August 1950
Apr 1950
3
October 1950
May 1950
4
December 1950
September 1950
5
January 1951
October 1950
6
March 1951
August 1950
7
April 1951
February 1951
8
November 1951
January 1951
9
February 1952
February 1950
10
March 1952
November 1950
11
April 1952
December 1950
12
July 1952
March 1951
13
September 1952
April 1951
14
October 1952
May 1951
15
November 1952
August 1951
16
January 1953
June 1951
17
February 1953
September 1951
18
April 1953
October 1951
19
June 1953
April 1952
20
July 1953
June 1952

21

August 1953

July 1950

22

September 1953

January 1953

23

October 1953

December 1951

24

February 1954

December 1952

The contents were initially identical to the U.S. editions, but starting with issue #13 at least one story was dropped.[6][8]

Starting in 1941, unsold issues of Fantastic Adventures were rebound, three together, with a new cover, titled Fantastic Adventures Quarterly. There were eight of these quarterly issues between Winter 1941 and Fall 1943; they were priced at 25 cents and given a volume numbering from volume 1 number 1 to volume 2 number 4. Another similar series was started in Summer 1948, for 50 cents; there were eleven of these, running from volume 6 number 1 to volume 9 number 1, finishing with the Spring 1951 issue and omitting Spring 1949.[6][8]

In 1965, Sol Cohen acquired both Amazing Stories and Fantastic from Ziff-Davis, along with reprint rights to all the stories that had appeared in the Ziff-Davis science fiction magazines, including Fantastic Adventures.[20] Cohen published multiple reprint titles, and frequently reprinted stories from Fantastic Adventures. In particular, the following issues took their contents mostly or completely from Fantastic Adventures:[8][21]

Fantastic Adventures Yearbook. One issue in the summer of 1970, no number, dated only with the year. Reprinted six stories from Fantastic Adventures that had originally appeared between 1949 and 1952.

Thrilling Science Fiction. Issues 16 and 20 (Summer 1970 and Summer 1971).

Science Fiction Adventures. January 1974 issue.

Science Fantasy. All four issues, from 1970 to 1971.

The Strangest Stories Every Told. One issue, Summer 1970.

Weird Mystery. There were four issues of this magazine between Fall 1970 and Summer 1971; the contents were drawn largely from Fantastic Adventures.

^ Bedsheet magazines were approximately 8.5 by 11.75 inches (220 mm × 298 mm).[5]

^ Malcolm Edwards & Peter Nicholls, "SF Magazines", in Clute & Nicholls, Encyclopedia of Science Fiction, pp. 1066–1068.

^ Ashley, Time Machines, p. 76.

^ Ashley, Time Machines, p. 115.

^ a b c d e f g h i Ashley, Time Machines, pp. 142–146.

^ Peter Nicholls, "Bedsheet", in Clute & Nicholls, Encyclopedia of Science Fiction, p. 102.

^ a b c d "Fantastic Adventures", in Tuck, Encyclopedia of Science Fiction and Fantasy, Vol. 3, pp. 558–559.

^ a b c d e f Brian Stableford, "Fantastic Adventures", in Clute & Nicholls, Encyclopedia of Science Fiction, p. 404.

^ a b c d e f g h i j k l m n o p q r s t u v w x Mike Ashley, "Fantastic Adventures", in Tymn & Ashley, Science Fiction, Fantasy and Weird Fiction Magazines, pp. 232–240.

^ a b Ashley, Transformations, p. 7.

^ a b Ashley, Transformations, pp. 48–50.

^ See the individual issues. For convenience, an online index is available at "Magazine:Fantastic Adventures ~ ISFDB". Al von Ruff (Publisher).

http://www.isfdb.org/wiki/index.php/Magazine:Fantastic_Adventures. Retrieved 28

January 2011. An index to the British reprints is at "Visco navigation". Terry Gibbons. <http://sfcovers.net/Magazines/FAD12/index.htm>. Retrieved 28 January 2011.

- ^ de Camp, Science-Fiction Handbook, p. 120.
- ^ a b Ashley, Time Machines, p. 178.
- ^ Ashley, Time Machines, p. 183.
- ^ Ashley, History of the Science Fiction Magazine, Vol. 3, p. 24.
- ^ a b Aldiss & Wingrove, Trillion Year Spree, pp. 222, 463, 464.
- ^ Ashley, Transformations, p. 6.
- ^ Clute, Science Fiction: The Illustrated Encyclopedia, p. 101.
- ^ Carter, Creation of Tomorrow, p. 183.
- ^ Ashley, Transformations, p. 228.
- ^ Mike Ashley, "Fantastic Adventures Yearbook", in Tymn & Ashley, Science Fiction, Fantasy and Weird Fiction Magazines, pp. 240-241.

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A B movie is a low-budget commercial motion picture that is not definitively an arthouse or pornographic film. In its original usage, during the Golden Age of Hollywood, the term more precisely identified a film intended for distribution as the less-publicized, bottom half of a double feature. Although the U.S. production of movies intended as second features largely ceased by the end of the 1950s, the term B movie continued to be used in the broader sense it maintains today. In its post-Golden Age usage, there is ambiguity on both sides of the definition: on the one hand, many B movies display a high degree of craft and aesthetic ingenuity; on the other, the primary interest of many inexpensive exploitation films is prurient. In some cases, both may be true.

In either usage, most B movies represent a particular genre—the Western was a Golden Age B movie staple, while low-budget science-fiction and horror films became more popular in the 1950s. Early B movies were often part of series in which the star repeatedly played the same character. Almost always shorter than the top-billed films they were paired with, many had running times of 70 minutes or less. The term connoted a general perception that B movies were inferior to the more handsomely budgeted headliners; individual B films were often ignored by critics.

Latter-day B movies still sometimes inspire multiple sequels, but series are

less common. As the average running time of top-of-the-line films increased, so did that of B pictures. In its current usage, the term has somewhat contradictory connotations: it may signal an opinion that a certain movie is (a) a genre film with minimal artistic ambitions or (b) a lively, energetic film uninhibited by the constraints imposed on more expensive projects and unburdened by the conventions of putatively "serious" independent film. The term is also now used loosely to refer to some higher budgeted, mainstream films with exploitation-style content, usually in genres traditionally associated with the B movie.

From their beginnings to the present day, B movies have provided opportunities both for those coming up in the profession and others whose careers are waning. Celebrated filmmakers such as Anthony Mann and Jonathan Demme learned their craft in B movies. They are where actors such as John Wayne and Jack Nicholson first became established, and they have provided work for former A movie actors, such as Vincent Price and Karen Black. Some actors, such as Bela Lugosi and Pam Grier, worked in B movies for most of their careers. The term B actor is sometimes used to refer to a performer who finds work primarily or exclusively in B pictures.

[edit] History

[edit] Roots of the B movie: 1920s

It is not clear that the term B movie (or B film or B picture) was in general use before the 1930s, but a similar concept was already well established. In 1927-28, at the end of the silent era, the production cost of an average feature from a major Hollywood studio ranged from \$190,000 at Fox to \$275,000 at MGM. That average reflected both "specials" that might cost as much as \$1 million and films made quickly for around \$50,000. These cheaper films allowed the studios to derive maximum value from facilities and contracted staff in between a studio's more important productions, while also breaking in new personnel.[2] Studios in the minor leagues of the industry, such as Columbia Pictures and Film Booking Offices of America (FBO), focused on exactly those sort of cheap productions. Their movies, with relatively short running times, targeted theaters that had to economize on rental and operating costs, particularly small-town and urban neighborhood venues, or "nabes". Even smaller production houses, known as Poverty Row studios, made films whose costs might run as low as \$3,000, seeking a profit through whatever bookings they could pick up in the gaps left by the larger concerns.[3]

With the widespread arrival of sound film in American theaters in 1929, many independent exhibitors began dropping the then-dominant presentation model, which involved live acts and a broad variety of shorts before a single featured film. A new programming scheme developed that would soon become standard practice: a newsreel, a short and/or a serial, and a cartoon, followed by a double feature. The second feature, which actually screened before the main event, cost the exhibitor less per minute than the equivalent running time in shorts. The majors' "clearance" rules favoring their affiliated theaters prevented the independents' timely access to top-quality films; the second feature allowed them to promote quantity instead.[4] The additional movie also gave the program "balance" - the practice of pairing different sorts of features suggested to potential customers that they could count on something of interest no matter what specifically was on the bill. The low-budget picture of the 1920s thus evolved into the second feature, the B movie, of Hollywood's Golden Age.[5]

[edit] Bs in the Golden Age of Hollywood: 1930s

The major studios, at first resistant to the double feature, soon adapted. All established B units to provide films for the expanding second-feature market. Block booking became standard practice: to get access to a studio's attractive A pictures, many theaters were obliged to rent the company's entire output for a season. With the B films rented at a flat fee (rather than the box office percentage basis of A films), rates could be set virtually guaranteeing the profitability of every B movie. The parallel practice of blind bidding largely freed the majors from worrying about their Bs' quality - even when booking in

less than seasonal blocks, exhibitors had to buy most pictures sight unseen. The five largest studiosâMetro-Goldwyn-Mayer, Paramount Pictures, Fox Film Corporation (20th Century Fox as of 1935), Warner Bros., and RKO Radio Pictures (descendant of FBO)âalso belonged to companies with sizable theater chains, further securing the bottom line.[6]

Poverty Row studios, from modest outfits like Mascot Pictures, Tiffany Pictures, and Sono Art-World Wide Pictures down to shoestring operations, made exclusively B movies, serials, and other shorts, and also distributed totally independent productions and imported films. In no position to directly block book, they mostly sold regional distribution exclusivity to "states rights" firms, which in turn peddled blocks of movies to exhibitors, typically six or more pictures featuring the same star (a relative status on Poverty Row).[7] Two "major-minors"âUniversal Studios and rising Columbia Picturesâhad production lines roughly similar to, though somewhat better endowed than, the top Poverty Row studios. In contrast to the Big Five majors, Universal and Columbia had few or no theaters, though they did have top-rank film distribution exchanges.[8]

In the standard Golden Age model, the industry's top product, the A films, premiered at a small number of select first-run houses in major cities. Double features were not the rule at these prestigious venues. As described by historian Edward Jay Epstein, "During these first runs, films got their reviews, garnered publicity, and generated the word of mouth that served as the principal form of advertising." [9] Then it was off to the subsequent-run market where the double feature prevailed. At the larger local venues controlled by the majors, movies might turn over on a weekly basis. At the thousands of smaller, independent theaters, programs often changed two or three times a week. To meet the constant demand for new B product, the low end of Poverty Row turned out a stream of micro-budget movies rarely much more than sixty minutes long; these were known as "quickies" for their tight production schedulesâas short as four days.[10] As Brian Taves describes, "Many of the poorest theaters, such as the 'grind houses' in the larger cities, screened a continuous program emphasizing action with no specific schedule, sometimes offering six quickies for a nickel in an all-night show that changed daily." [11] Many small theaters never saw a big-studio A film, getting their movies from the states rights concerns that handled almost exclusively Poverty Row product. Millions of Americans went to their local theaters as a matter of course: for an A picture, along with the trailers, or screen previews, that presaged its arrival, "[t]he new film's title on the marquee and the listings for it in the local newspaper constituted all the advertising most movies got", writes Epstein.[12] Aside from at the theater itself, B films might not be advertised at all.

The introduction of sound had driven costs higher: by 1930, the average U.S. feature film cost \$375,000 to produce.[13] A broad range of motion pictures occupied the B category. The leading studios made not only clear-cut A and B films, but also movies classifiable as "programmers" (also known as "in-betweeners" or "intermediates"). As Taves describes, "Depending on the prestige of the theater and the other material on the double bill, a programmer could show up at the top or bottom of the marquee." [14] On Poverty Row, many Bs were made on budgets that would have barely covered petty cash on a major's A film, with costs at the bottom of the industry running as low as \$5,000.[10] By the mid-1930s, the double feature was the dominant U.S. exhibition model, and the majors responded. In 1935, B movie production at Warner Bros. was raised from 12 to 50 percent of studio output. The unit was headed by Bryan Foy, known as the "Keeper of the Bs." [15] At Fox, which also shifted half of its production line into B territory, Sol M. Wurtzel was similarly in charge of more than twenty movies a year during the late 1930s.[16]

A number of the top Poverty Row firms consolidated: Sono Art joined another company to create Monogram Pictures early in the decade. In 1935, Monogram, Mascot, and several smaller studios merged to establish Republic Pictures. The former heads of Monogram soon sold off their Republic shares and set up a new

Monogram production house.[17] Into the 1950s, most Republic and Monogram product was roughly on par with the low end of the majors' output. Less sturdy Poverty Row concernsâ ~with a penchant for grand sobriquets like Conquest, Empire, Imperial, and Peerlessâ ~continued to churn out dirt-cheap quickies.[18] Joel Finler has analyzed the average length of feature releases in 1938, indicating the studios' relative emphasis on B production[19] (United Artists produced little, focusing on the distribution of prestigious films from independent outfits; Grand National, active 1936â ^40, occupied an analogous niche on Poverty Row, releasing mostly independent productions[20]):

Studio	
Category	
Avg. duration	
MGM	
Big Five	
87.9 minutes	
Paramount	
Big Five	
76.4 minutes	
20th Century-Fox	
Big Five	
75.3 minutes	
Warner Bros.	
Big Five	
75.0 minutes	
RKO	
Big Five	
74.1 minutes	
United Artists	
Little Three	
87.6 minutes	
Columbia	
Little Three	
66.4 minutes	
Universal	
Little Three	
66.4 minutes	
Grand National	
Poverty Row	
63.6 minutes	
Republic	
Poverty Row	
63.1 minutes	
Monogram	
Poverty Row	
60.0 minutes	

Taves estimates that half of the films produced by the eight majors in the 1930s were B movies. Calculating in the three hundred or so films made annually by the many Poverty Row firms, approximately 75 percent of Hollywood movies from the decade, more than four thousand pictures, are classifiable as Bs.[21]

The Western was by far the predominant B genre in both the 1930s and, to a lesser degree, the 1940s.[22] Film historian Jon Tuska has argued that "the 'B' product of the Thirtiesâ ~the Universal films with [Tom] Mix, [Ken] Maynard, and [Buck] Jones, the Columbia features with Buck Jones and Tim McCoy, the RKO George O'Brien series, the Republic Westerns with John Wayne and the Three Mesquiteers ... achieved a uniquely American perfection of the well-made story." [23] At the far end of the industry, Poverty Row's Ajax put out oaters starring Harry Carey, then in his fifties. The Weiss outfit had the Range Rider series, the American Rough Rider series, and the Morton of the Mounted "northwest action thrillers." [24] One low-budget oater of the era, made totally

outside the studio system, profited from an outrageous concept: a Western with an all-midget cast, *The Terror of Tiny Town* (1938) was such a success in its independent bookings that Columbia picked it up for distribution.[25]

Series of various genres, featuring recurrent, title-worthy characters or name actors in familiar roles, were particularly popular during the first decade of sound film. Fox's many B series, for instance, included Charlie Chan mysteries, Ritz Brothers comedies, and musicals with child star Jane Withers.[26] These series films are not to be confused with the short, cliffhanger-structured serials that sometimes appeared on the same program. As with serials, however, many series were intended to attract young people—a theater that twin-billed part-time might run a "balanced" or entirely youth-oriented double feature as a matinee and then a single film for a more mature audience at night. In the words of one industry report, afternoon moviegoers, "composed largely of housewives and children, want quantity for their money while the evening crowds want 'something good and not too much of it.'"[27] Series films are often unquestioningly consigned to the B movie category, but even here there is ambiguity: at MGM, for example, popular series like the Andy Hardy chronicles had leading stars and budgets that would have been A-level at some of the lesser majors.[28] For many series, even a lesser major's standard B budget was far out of reach: Poverty Row's Consolidated Pictures featured Tarzan, the Police Dog in a series with the proud name of Melodramatic Dog Features.[29]

[edit] Bs in the Golden Age of Hollywood: 1940s

By 1940, the average production cost of an American feature was \$400,000, a negligible increase over ten years.[13] A number of small Hollywood companies had folded around the turn of the decade, including the ambitious Grand National, but a new firm, Producers Releasing Corporation (PRC), emerged as third in the Poverty Row hierarchy behind Republic and Monogram. The double feature, never universal, was still the prevailing exhibition model: in 1941, 50 percent of theaters were double-billing exclusively, and others employed the policy part-time.[30] In the early 1940s, legal pressure forced the studios to replace seasonal block booking with packages generally limited to five pictures. Restrictions were also placed on the majors' ability to enforce blind bidding.[31] These were crucial factors in the progressive shift by most of the Big Five over to A-film production, making the smaller studios even more important as B movie suppliers. Genre pictures made at very low cost remained the backbone of Poverty Row, with even Republic's and Monogram's budgets rarely climbing over \$200,000. Many smaller Poverty Row firms folded as the eight majors, with their proprietary distribution exchanges, now commanded about 95 percent of U.S. and Canadian box office receipts.[32] In 1946, independent producer David O. Selznick brought his bloated-budget spectacle *Duel in the Sun* to market with heavy nationwide promotion and wide release. The distribution strategy was a major success, despite what was widely perceived as the movie's poor quality.[33] The *Duel* release anticipated practices that fueled the B movie industry in the late 1950s; when the top Hollywood studios made them standard two decades after that, the B movie would be hard hit.[34]

Considerations beside cost made the line between A and B movies ambiguous. Films shot on B-level budgets were occasionally marketed as A pictures or emerged as sleeper hits: One of 1943's biggest films was *Hitler's Children*, an RKO thriller made for a fraction over \$200,000. It earned more than \$3 million in rentals, industry language for a distributor's share of gross box office receipts.[35] Particularly in the realm of film noir, A pictures sometimes echoed visual styles generally associated with cheaper films. Programmers, with their flexible exhibition role, were ambiguous by definition. As late as 1948, the double feature remained a popular exhibition mode—it was standard policy at 25 percent of theaters and used part-time at an additional 36 percent.[36] The leading Poverty Row firms began to broaden their scope: In 1947, Monogram established a subsidiary, Allied Artists, to develop and distribute relatively expensive films, mostly from independent producers. Around the same time, Republic launched a similar effort under the "Premiere" rubric.[37] In 1947 as well, PRC was subsumed by Eagle-Lion, a British company seeking entry to the

American market. Warners' former Keeper of the Bs, Brian Foy, was installed as production chief.[38]

In the 1940s, RKO stood out among the industry's Big Five for its focus on B pictures.[40] From a latter-day perspective, the most famous of the major studios' Golden Age B units is Val Lewton's horror unit at RKO. Lewton produced such moody, mysterious films as *Cat People* (1942), *I Walked with a Zombie* (1943), and *The Body Snatcher* (1945), directed by Jacques Tourneur, Robert Wise, and others who would become renowned only later in their careers or entirely in retrospect.[41] The movie now widely described as the first classic film noir—*Stranger on the Third Floor* (1940), a 64-minute B—was produced at RKO, which would release many additional melodramatic thrillers in a similarly stylish vein.[42] The other major studios also turned out a considerable number of movies now identified as noir during the 1940s. Though many of the best-known film noirs were A-level productions, most 1940s pictures in the mode were either of the ambiguous programmer type or destined straight for the bottom of the bill. In the decades since, these cheap entertainments, generally dismissed at the time, have become some of the most treasured products of Hollywood's Golden Age.[43]

In one sample year, 1947, RKO produced along with several noir programmers and A pictures, two straight B noirs: *Desperate* and *The Devil Thumbs a Ride*. [44] Ten B noirs that year came from Poverty Row's big three—Republic, Monogram, and PRC/Eagle-Lion—and one came from tiny Screen Guild. Three majors beside RKO contributed a total of five more. Along with these eighteen unambiguous B noirs, an additional dozen or so noir programmers came out of Hollywood.[45] Still, most of the majors' low-budget production remained the sort now largely ignored. RKO's representative output included the Mexican Spitfire and Lum and Abner comedy series, thrillers featuring the Saint and the Falcon, Westerns starring Tim Holt, and Tarzan movies with Johnny Weissmuller. Jean Hersholt played Dr. Christian in six films between 1939 and 1941.[46] *The Courageous Dr. Christian* (1940) was a standard entry: "In the course of an hour or so of screen time, the saintly physician managed to cure an epidemic of spinal meningitis, demonstrate benevolence towards the disenfranchised, set an example for wayward youth, and calm the passions of an amorous old maid." [47]

Down in Poverty Row, low budgets led to less palliative fare. Republic aspired to major-league respectability while making many cheap and modestly budgeted Westerns, but there was not much from the bigger studios that compared with Monogram "exploitation pictures" like juvenile delinquency exposé *Where Are Your Children?* (1943) and the prison film *Women in Bondage* (1943). [48] In 1947, PRC's *The Devil on Wheels* brought together teenagers, hot rods, and death. The little studio had its own house auteur: with his own crew and relatively free rein, director Edgar G. Ulmer was known as "the Capra of PRC". [49] Ulmer made films of every generic stripe: *His Girls in Chains* was released in May 1943, six months before *Women in Bondage*; by the end of the year, Ulmer had also made the teen-themed musical *Jive Junction* as well as *Isle of Forgotten Sins*, a South Seas adventure set around a brothel. [50]

[edit] Transition I/The B movie in the television age: 1950s

In 1948, a Supreme Court ruling in a federal antitrust suit against the majors outlawed block booking and led to the Big Five divesting their theater chains. With audiences draining away to television and studios scaling back production schedules, the classic double feature vanished from many American theaters during the 1950s. The major studios promoted the benefits of recycling, offering former headlining movies as second features in the place of traditional B films. [51] With television airing many classic Westerns as well as producing its own original Western series, the cinematic market for B oaters in particular was drying up. After barely inching forward in the 1930s, the average U.S. feature production cost had essentially doubled over the 1940s, reaching \$1 million by the turn of the decade—a 93 percent rise after adjusting for inflation. [13]

The first prominent victim of the changing market was Eagle-Lion, which released its last films in 1951. By 1953, the old Monogram brand had

disappeared, the company having adopted the identity of its higher-end subsidiary, Allied Artists. The following year, Allied released Hollywood's last B series Westerns. Non-series B Westerns continued to appear for a few more years, but Republic Pictures, long associated with cheap sagebrush sagas, was out of the filmmaking business by decade's end. In other genres, Universal kept its Ma and Pa Kettle series going through 1957, while Allied Artists stuck with the Bowery Boys until 1958.[52] RKO, weakened by years of mismanagement, exited the movie industry in 1957.[53] Hollywood's A product was getting longerâˆ“the top ten box-office releases of 1940 had averaged 112.5 minutes; the average length of 1955's top ten was 123.4.[54] In their modest way, the Bs were following suit. The age of the hour-long feature film was past; 70 minutes was now roughly the minimum. While the Golden Ageâˆ“style second feature was dying, B movie was still used to refer to any low-budget genre film featuring relatively unheralded performers (sometimes referred to as B actors). The term retained its earlier suggestion that such movies relied on formulaic plots, "stock" character types, and simplistic action or unsophisticated comedy.[55] At the same time, the realm of the B movie was becoming increasingly fertile territory for experimentation, both serious and outlandish.

Ida Lupino, well known as an actress, established herself as Hollywood's sole female director of the era.[56] In short, low-budget pictures made for her production company, The Filmakers, Lupino explored virtually taboo subjects such as rape in 1950's *Outrage* and 1953's self-explanatory *The Bigamist*. [57] Her most famous directorial effort, *The Hitch-Hiker*, a 1953 RKO release, is the only example of film noir's classic period directed by a woman.[58] That year, RKO put out another historically notable film made at low cost: *Split Second*, which concludes in a nuclear test range, is perhaps the first "atomic noir".[59] The most famous such movie, the independently produced *Kiss Me Deadly* (1955), typifies the persistently murky middle ground between the A and B picture, as Richard Maltby describes: a "programmer capable of occupying either half of a neighbourhood theatre's double-bill, [it was] budgeted at approximately \$400,000. [Its] distributor, United Artists, released around twenty-five programmers with production budgets between \$100,000 and \$400,000 in 1955." [60] The film's length, 106 minutes, is A level, but its star, Ralph Meeker, had previously appeared in only one major film. Its source is pure pulp, one of Mickey Spillane's Mike Hammer novels, but Robert Aldrich's direction is self-consciously aestheticized. The result is a brutal genre picture that also evokes contemporary anxieties about what was often spoken of simply as the Bomb.[61]

The fear of nuclear war with the Soviet Union, along with less expressible qualms about radioactive fallout from America's own atomic tests, energized many of the era's genre films. Science fiction, horror, and various hybrids of the two were now of central economic importance to the low-budget end of the business. Most down-market films of the typeâˆ“like many of those produced by William Alland at Universal (e.g., *Creature from the Black Lagoon* [1954]) and Sam Katzman at Columbia (e.g., *It Came from Beneath the Sea* [1955])âˆ“provided little more than thrills, though their special effects could be impressive.[63] But these were genres whose fantastic nature could also be used as cover for mordant cultural observations often difficult to make in mainstream movies. Director Don Siegel's *Invasion of the Body Snatchers* (1956), released by Allied Artists, treats conformist pressures and the evil of banality in haunting, allegorical fashion.[64] *The Amazing Colossal Man* (1957), directed by Bert I. Gordon, is both a monster movie that happens to depict the horrific effects of radiation exposure and "a ferocious cold-war fable [that] spins Korea, the army's obsessive secrecy, and America's post-war growth into one fantastic whole." [65]

The Amazing Colossal Man was released by a new company whose name was much bigger than its budgets. American International Pictures (AIP), founded in 1956 by James H. Nicholson and Samuel Z. Arkoff in a reorganization of their American Releasing Corporation (ARC), soon became the leading U.S. studio devoted entirely to B-cost productions. American International helped keep the

original-release double bill alive through paired packages of its films: these movies were low-budget, but instead of a flat rate, they were rented out on a percentage basis, like A films.[66] The success of *I Was a Teenage Werewolf* (1957) thus brought AIP a large return—made for about \$100,000, it grossed more than \$2 million.[67] As the film's title suggests, the studio relied on both fantastic genre subjects and new, teen-oriented angles. When *Hot Rod Gang* (1958) turned a profit, hot rod horror was given a try: *Ghost of Dragstrip Hollow* (1959). David Cook credits AIP with leading the way "in demographic exploitation, target marketing, and saturation booking, all of which would become standard procedure for the majors in planning and releasing their mass-market 'event' films" by the late 1970s.[68] In terms of content, the majors were already there, with "J.D." movies such as Warner Bros.' *Untamed Youth* (1957) and MGM's *High School Confidential* (1958), both starring Mamie Van Doren.[69]

In 1954, a young filmmaker named Roger Corman received his first screen credits as writer and associate producer of Allied Artists' *Highway Dragnet*. Corman soon independently produced his first movie, *Monster from the Ocean Floor*, on a \$12,000 budget and a six-day shooting schedule.[70] Among the six films he worked on in 1955, Corman produced and directed the first official ARC release, *Apache Woman*, and *Day the World Ended*, half of Arkoff and Nicholson's first twin-bill package. Corman would go on to direct over fifty feature films through 1990. As of 2007, he remained active as a producer, with more than 350 movies to his credit. Often referred to as the "King of the Bs", Corman has said that "to my way of thinking, I never made a 'B' movie in my life", as the traditional B movie was dying out when he began making pictures. He prefers to describe his metier as "low-budget exploitation films".[71] In later years Corman, both with AIP and as head of his own companies, would help launch the careers of Francis Ford Coppola, Jonathan Demme, Robert Towne, and Robert De Niro, among many others.[72]

In the late 1950s, William Castle became known as the great innovator of the B movie publicity gimmick. Audiences of *Macabre* (1958), an \$86,000 production distributed by Allied Artists, were invited to take out insurance policies to cover potential death from fright. The 1959 creature feature *The Tingler* featured Castle's most famous gimmick, *Percepto*: at the film's climax, buzzers attached to select theater seats would unexpectedly rattle a few audience members, prompting either appropriate screams or even more appropriate laughter.[73] With such films, Castle "combine[d] the saturation advertising campaign perfected by Columbia and Universal in their Sam Katzman and William Alland packages with centralized and standardized publicity stunts and gimmicks that had previously been the purview of the local exhibitor." [74]

The postwar drive-in theater boom was vital to the expanding independent B movie industry. In January 1945, there were 96 drive-ins in the United States; a decade later, there were more than 3,700.[75] Unpretentious pictures with simple, familiar plots and reliable shock effects were ideally suited for auto-based film viewing, with all its attendant distractions. The phenomenon of the drive-in movie became one of the defining symbols of American popular culture in the 1950s. At the same time, many local television stations began showing B genre films in late-night slots, popularizing the notion of the midnight movie.[76]

Increasingly, American-made genre films were joined by foreign movies acquired at low cost and, where necessary, dubbed for the U.S. market. In 1956, distributor Joseph E. Levine financed the shooting of new footage with American actor Raymond Burr that was edited into the Japanese sci-fi horror film *Godzilla*. [77] The British Hammer Film Productions made the successful *The Curse of Frankenstein* (1957) and *Dracula* (1958), major influences on future horror film style. In 1959, Levine's Embassy Pictures bought the worldwide rights to *Hercules*, a cheaply made Italian movie starring American-born bodybuilder Steve Reeves. On top of a \$125,000 purchase price, Levine then spent \$1.5 million on advertising and publicity, a virtually unprecedented amount.[78] The *New York Times* was nonplussed, claiming that the movie would have drawn "little more

than yawns in the film marketÂ ... had it not been [launched] throughout the country with a deafening barrage of publicity." [79] Levine counted on first-weekend box office for his profits, booking the film "into as many cinemas as he could for a week's run, then withdrawing it before poor word-of-mouth withdrew it for him." [80] Hercules opened at a remarkable 600 theaters, and the strategy was a smashing success: the film earned \$4.7 million in domestic rentals. Just as valuable to the bottom line, it was even more successful overseas. [78] Within a few decades, Hollywood would be dominated by both movies and an exploitation philosophy very like Levine's.

[edit] Golden age of exploitation: 1960s

Despite all the transformations in the industry, by 1961 the average production cost of an American feature film was still only \$2 millionâ ~after adjusting for inflation, less than 10 percent more than it had been in 1950. [13] The traditional twin bill of B film preceding and balancing a subsequent-run A film had largely disappeared from American theaters. The AIP-style dual genre package was the new model. In July 1960, the latest Joseph E. Levine sword-and-sandals import, Hercules Unchained, opened at neighborhood theaters in New York. A suspense film, Terror Is a Man, ran as a "co-feature" with a now familiar sort of exploitation gimmick: "The dÃ©nouement helpfully includes a 'warning bell' so the sensitive can 'close their eyes.'" [81] That year, Roger Corman took AIP down a new road: "When they asked me to make two ten-day black-and-white horror films to play as a double feature, I convinced them instead to finance one horror film in color." [82] The resulting House of Usher typifies the continuing ambiguities of B picture classification. It was clearly an A film by the standards of both director and studio, with the longest shooting schedule and biggest budget Corman had ever enjoyed. But it is generally seen as a B movie: the schedule was still a mere fifteen days, the budget just \$200,000 (one-tenth the industry average), [83] and its 85-minute running time close to an old thumbnail definition of the B: "Any movie that runs less than 80 minutes." [84]

With the loosening of industry censorship constraints, the 1960s saw a major expansion in the commercial viability of a variety of B movie subgenres that became known collectively as exploitation films. The combination of intensive and gimmick-laden publicity with movies featuring vulgar subject matter and often outrageous imagery dated back decadesâ ~the term had originally defined truly fringe productions, made at the lowest depths of Poverty Row or entirely outside the Hollywood system. Many graphically depicted the wages of sin in the context of promoting prudent lifestyle choices, particularly "sexual hygiene". Audiences might see explicit footage of anything from a live birth to a ritual circumcision. [85] Such films were not generally booked as part of movie theaters' regular schedules but rather presented as special events by traveling roadshow promoters (they might also appear as fodder for "grindhouses", which typically had no regular schedule at all). The most famous of those promoters, Kroger Babb, was in the vanguard of marketing low-budget, sensationalistic films with a "100% saturation campaign", inundating the target audience with ads in almost any imaginable medium. [86] In the era of the traditional double feature, no one would have characterized these graphic exploitation films as "B movies". With the majors having exited traditional B production and exploitation-style promotion becoming standard practice at the lower end of the industry, "exploitation" became a way to refer to the entire field of low-budget genre films. [87] The 1960s would see exploitation-style themes and imagery become increasingly central to the realm of the B.

Exploitation movies in the original sense continued to appear: 1961's Damaged Goods, a cautionary tale about a young lady whose boyfriend's promiscuity leads to venereal disease, comes complete with enormous, grotesque closeups of VD's physical effects. [88] At the same time, the concept of fringe exploitation was merging with a related, similarly venerable tradition: "nudie" films featuring nudist-camp footage or striptease artists like Bettie Page had simply been the softcore pornography of previous decades. As far back as 1933, This Nude World was "Guaranteed the Most Educational Film Ever Produced!" [89] In the late

1950s, as more of the old grindhouse theaters devoted themselves specifically to "adult" product, a few filmmakers began making nudies with greater attention to plot. Best known was Russ Meyer, who released his first successful narrative nudie, the comic Immoral Mr. Teas, in 1959. Five years later, Meyer came out with his breakthrough film, Lorna, which combined sex, violence, and a dramatic storyline.[90]Faster, Pussycat! Kill! Kill! (1965), made for about \$45,000, would ultimately become the most famous of Meyer's so-called sexploitation pictures. Crafted for constant titillation but containing no nudity, it was aimed at the same "passion pit" drive-in circuit that screened AIP teen movies with wink-wink titles like Beach Blanket Bingo (1965) and How to Stuff a Wild Bikini (1966), starring Annette Funicello and Frankie Avalon.[91] Roger Corman's The Trip (1967) for American International, written by veteran AIP/Corman actor Jack Nicholson, never shows a fully bared, unpainted breast, but flirts with nudity throughout.[92] The Meyer and Corman lines were drawing closer.

One of the most influential films of the era, on Bs and beyond, was Paramount's Psycho. Its \$8.5 million in earnings against a production cost of \$800,000 made it the most profitable movie of 1960.[93] Its mainstream distribution without the Production Code seal of approval helped weaken U.S. film censorship. And, as William Paul notes, this move into the horror genre by respected director Alfred Hitchcock was made, "significantly, with the lowest-budgeted film of his American career and the least glamorous stars. [Its] greatest initial impact... was on schlock horror movies (notably those from second-tier director William Castle), each of which tried to bill itself as scarier than Psycho." [94] Castle's first film in the Psycho vein was Homicidal (1961), an early step in the development of the slasher subgenre that would take off in the late 1970s.[93]Blood Feast (1963), a movie about human dismemberment and culinary preparation made for approximately \$24,000 by experienced nudie-maker Herschell Gordon Lewis, established a new, more immediately successful subgenre, the gore or splatter film. Lewis's business partner David F. Friedman drummed up publicity by distributing vomit bags to theatergoers~the sort of gimmick Castle had mastered~and arranging for an injunction against the film in Sarasota, Florida~the sort of problem exploitation films had long run up against, except Friedman had planned it.[95] This new breed of gross-out movie typified the emerging sense of "exploitation"~the progressive adoption of traditional exploitation and nudie elements into horror, into other classic B genres, and into the low-budget film industry as a whole. Imports of Hammer Film's increasingly explicit horror movies and Italian gialli, highly stylized pictures mixing sexploitation and ultraviolence, would fuel this trend.[96]

The Production Code was officially scrapped in 1968, to be replaced by the first version of the modern rating system.[97] That year, two horror films came out that heralded directions American cinema would take in the next decade, with major consequences for the B movie. One was a high-budget Paramount production, directed by the celebrated Roman Polanski. Produced by B horror veteran William Castle, Rosemary's Baby was the first upscale Hollywood picture in the genre in three decades.[98] It was a critical success and the year's seventh-biggest hit.[99] The other was George A. Romero's Night of the Living Dead, produced on weekends in and around Pittsburgh for \$114,000. Building on the achievement of B genre predecessors like Invasion of the Body Snatchers in its subtextual exploration of social and political issues, it doubled as a highly effective thriller and an incisive allegory for both the Vietnam War and domestic racial conflicts. Its greatest influence, though, derived from its clever subversion of genre clichés and the connection made between its exploitation-style imagery, low-cost, truly independent means of production, and high profitability.[100] With the Code gone and the X rating established, major studio A films like Midnight Cowboy could now show "adult" imagery, while the market for increasingly hardcore pornography exploded. In this transformed commercial context, work like Russ Meyer's gained a new legitimacy. In 1969, for the first time a Meyer film, Finders Keepers, Lovers Weepers!, was reviewed

in The New York Times.[101] Soon, Corman would be putting out nudity-filled sexploitation pictures such as *Private Duty Nurses* (1971) and *Women in Cages* (1971).[102]

In May 1969, the most important exploitation movie of the era premiered at the Cannes Film Festival.[103] Much of *Easy Rider*'s significance owes to the fact that it was produced for a respectable, if still modest, budget and released by a major studio. The project was first taken by one of its cocreators, Peter Fonda, to American International. Fonda had become AIP's top star in the Corman-directed *The Wild Angels* (1966), a biker movie, and *The Trip*, as in *LSD*. The idea Fonda pitched would combine those two proven themes. AIP was intrigued but balked at giving his collaborator, Dennis Hopper, also a studio alumnus, free directorial rein. Eventually they arranged a financing and distribution deal with Columbia, as two more graduates of the Corman/AIP exploitation mill joined the project: Jack Nicholson and cinematographer László Kovács.[104] The film (which incorporated another favorite exploitation theme, the redneck menace, as well as a fair amount of nudity) was brought in at a cost of \$501,000. It earned \$19.1 million in rentals.[105] In the words of historians Seth Cagin and Philip Dray, *Easy Rider* became "the seminal film that provided the bridge between all the repressed tendencies represented by schlock/kitsch/hack since the dawn of Hollywood and the mainstream cinema of the seventies." [106]

[edit] Golden age of exploitation: 1970s

In the late 1960s and early 1970s, a new generation of low-budget film companies emerged that drew from all the different lines of exploitation as well as the sci-fi and teen themes that had been a mainstay since the 1950s. Operations such as Roger Corman's New World Pictures, Cannon Films, and New Line Cinema brought exploitation films to mainstream theaters around the country. The major studios' top product was continuing to inflate in running time~in 1970, the ten biggest earners averaged 140.1 minutes.[107] The Bs were keeping pace. In 1955, Corman had a producerial hand in five movies averaging 74.8 minutes. He played a similar part in five films originally released in 1970, two for AIP and three for his own New World: the average length was 89.8 minutes.[108] These films could turn a tidy profit. The first New World release, the biker movie *Angels Die Hard*, cost \$117,000 to produce and took in more than \$2 million at the box office.[109]

The biggest studio in the low-budget field remained a leader in exploitation's growth. In 1973, American International gave a shot to young director Brian De Palma. Reviewing *Sisters*, Pauline Kael observed that its "limp technique doesn't seem to matter to the people who want their gratuitous gore.Â ... [H]e can't get two people talking in order to make a simple expository point without its sounding like the drabbest Republic picture of 1938." [110] Many examples of the so-called blaxploitation genre, featuring stereotype-filled stories revolving around drugs, violent crime, and prostitution, were the product of AIP. One of blaxploitation's biggest stars was Pam Grier, who began her film career with a bit part in Russ Meyer's *Beyond the Valley of the Dolls* (1970). Several New World pictures followed, including *The Big Doll House* (1971) and *The Big Bird Cage* (1972), both directed by Jack Hill. Hill also directed her best-known performances, in two AIP blaxploitation films: *Coffy* (1973) and *Foxy Brown* (1974).[111]

Blaxploitation was the first exploitation genre in which the major studios were central. Indeed, the United Artists release *Cotton Comes to Harlem* (1970), directed by Ossie Davis, is seen as the first significant film of the type.[112] But the movie that truly ignited the blaxploitation phenomenon was completely independent: *Sweet Sweetback's Baadasssss Song* (1971) is also perhaps the most outrageous example of the form: wildly experimental, borderline pornographic, and essentially a manifesto for a black American revolution.[113] Melvin Van Peebles wrote, co-produced, directed, starred in, edited, and composed the music for the film, which was completed with a loan from Bill Cosby.[114] Its distributor was small Cinemation Industries, then best known for releasing dubbed versions of the Italian *Mondo Cane*

"shockumentaries" and the Swedish skin flick *Fanny Hill*, as well as for its one in-house production, *The Man from O.R.G.Y.* (1970).[115] These sorts of films played in the "grindhouses" of the day—many of them not outright porno theaters, but rather venues for all manner of exploitation cinema. The days of six quickies for a nickel were gone, but a continuity of spirit was evident.[116]

In 1970, a low-budget crime drama shot in 16mm by first-time American director Barbara Loden won the international critics' prize at the Venice Film Festival.[118] *Wanda* is both a seminal event in the independent film movement and a classic B picture. The crime-based plot and often seedy settings would have suited a straightforward exploitation film or an old-school B noir. The \$115,000 production,[118] for which Loden spent six years raising money, was praised by Vincent Canby for "the absolute accuracy of its effects, the decency of its point of view and... purity of technique." [119] Like Romero and Van Peebles, other filmmakers of the era made pictures that combined the gut-level entertainment of exploitation with biting social commentary. The first three features directed by Larry Cohen, *Bone* (1972), *Black Caesar* (1973), and *Hell Up in Harlem* (1973), were all nominally blaxploitation movies, but Cohen used them as vehicles for a satirical examination of race relations and the wages of dog-eat-dog capitalism.[120] The gory horror film *Deathdream* (1974), directed by Bob Clark, is also an agonized protest of the war in Vietnam.[121] Canadian filmmaker David Cronenberg made serious-minded low-budget horror films whose implications are not so much ideological as psychological and existential: *Shivers* (1975), *Rabid* (1977), *The Brood* (1979).[122] *An Easy Rider* with conceptual rigor, the movie that most clearly presaged the way in which exploitation content and artistic treatment would be combined in modestly budgeted films of later years was United Artists' biker-themed *Electra Glide in Blue* (1973), directed by James William Guercio.[123] The New York Times reviewer thought little of it: "Under different intentions, it might have made a decent grade-C Roger Corman bike movie—though Corman has generally used more interesting directors than Guercio." [124]

In the early 1970s, the growing practice of screening nonmainstream motion pictures as late shows, with the goal of building a cult film audience, brought the midnight movie concept home to the cinema, now in a countercultural setting—something like a drive-in movie for the hip.[125] One of the first films adopted by the new circuit in 1971 was the three-year-old *Night of the Living Dead*. The midnight movie success of low-budget pictures made entirely outside of the studio system, like John Waters's *Pink Flamingos* (1972), with its campy spin on exploitation, spurred the development of the independent film movement.[126] *The Rocky Horror Picture Show* (1975), an inexpensive film from 20th Century-Fox that spoofed all manner of classic B picture clichés, became an unparalleled hit when it was relaunched as a late show feature the year after its initial, unprofitable release. Even as *Rocky Horror* generated its own subcultural phenomenon, it contributed to the mainstreaming of the theatrical midnight movie.[127]

Asian martial arts films began appearing as imports regularly during the 1970s. These "kung fu" films as they were often called, whatever martial art they featured, were popularized in the United States by the Hong Kong—produced movies of Bruce Lee and marketed to the same audience targeted by AIP and New World.[128] Horror continued to attract young, independent American directors. As Roger Ebert explained in one 1974 review, "Horror and exploitation films almost always turn a profit if they're brought in at the right price. So they provide a good starting place for ambitious would-be filmmakers who can't get more conventional projects off the ground." [129] The movie under consideration was *The Texas Chain Saw Massacre*. Made by Tobe Hooper for less than \$300,000, it became one of the most influential horror films of the 1970s.[130] John Carpenter's *Halloween* (1978), produced on a \$320,000 budget, grossed over \$80 million worldwide and effectively established the slasher flick as horror's primary mode for the next decade. Just as Hooper had learned from Romero's work, *Halloween*, in turn, largely followed the model of *Black Christmas* (1974),

directed by Deathdream's Bob Clark.[131]

On television, the parallels between the weekly series that became the mainstay of prime-time programming and the Hollywood series films of an earlier day had long been clear.[132] In the 1970s, original feature-length programming increasingly began to echo the B movie as well. As production of TV movies expanded with the introduction of the ABC Movie of the Week in 1969, soon followed by the dedication of other network slots to original features, time and financial factors shifted the medium progressively into B picture territory. Television films inspired by recent scandals—such as *The Ordeal of Patty Hearst*, which premiered a month after her release from prison in 1979—harkened all the way back to the 1920s and such movies as *Human Wreckage* and *When Love Grows Cold*, FBO pictures made swiftly in the wake of celebrity misfortunes.[133] Many 1970s TV films—such as *The California Kid* (1974), starring Martin Sheen—were action-oriented genre pictures of a type familiar from contemporary cinematic B production. *Nightmare in Badham County* (1976) headed straight into the realm of road-tripping-girls-in-redneck-bondage exploitation.[134]

The reverberations of *Easy Rider* could be felt in such pictures, as well as in a host of theatrical exploitation films. But its greatest influence on the fate of the B movie was less direct—by 1973, the major studios were catching on to the commercial potential of genres once largely consigned to the bargain basement. Rosemary's Baby had been a big hit, but it had little in common with the exploitation style. Warner Bros.' *The Exorcist* demonstrated that a heavily promoted horror film could be an absolute blockbuster: it was the biggest movie of the year and by far the highest-earning horror movie yet made. In William Paul's description, it is also "the film that really established gross-out as a mode of expression for mainstream cinema. . . . [P]ast exploitation films managed to exploit their cruelties by virtue of their marginality. *The Exorcist* made cruelty respectable. By the end of the decade, the exploitation booking strategy of opening films simultaneously in hundreds to thousands of theaters became standard industry practice." [135] Writer-director George Lucas's *American Graffiti*, a Universal production, did something similar. Described by Paul as "essentially an American-International teenybopper pic with a lot more spit and polish", it was 1973's third biggest film and, likewise, by far the highest-earning teen-themed movie yet made.[136] Even more historically significant movies with B themes and A-level financial backing would follow in their wake.

[edit] Decline of the B: 1980s

Most of the B movie production houses founded during the exploitation era collapsed or were subsumed by larger companies as the field's financial situation changed in the early 1980s. Even a comparatively cheap, efficiently made genre picture intended for theatrical release began to cost millions of dollars, as the major movie studios steadily moved into the production of expensive genre movies, raising audience expectations for spectacular action sequences and realistic special effects.[137] Intimations of the trend were evident as early as *Airport* (1970) and especially in the mega-schlock of *The Poseidon Adventure* (1972), *Earthquake* (1973), and *The Towering Inferno* (1974). Their disaster plots and dialogue were B-grade at best; from an industry perspective, however, these were pictures firmly rooted in a tradition of star-stuffed extravaganzas. *The Exorcist* had demonstrated the drawing power of big-budget, effects-laden horror. But the tidal shift in the majors' focus owed largely to the enormous success of three films: Steven Spielberg's creature feature *Jaws* (1975) and George Lucas's space opera *Star Wars* (1977) had each, in turn, become the highest-grossing film in motion picture history. *Superman*, released in December 1978, had proved that a studio could spend \$55 million on a movie about a children's comic book character and turn a big profit—it was the top box-office hit of 1979.[138] Blockbuster fantasy spectacles like the original 1933 *King Kong* had once been exceptional; in the new Hollywood, increasingly under the sway of multi-industrial conglomerates, they would rule.[139]

It had taken a decade and half, from 1961 to 1976, for the production cost of the average Hollywood feature to double from \$2 million to \$4 millionâ ~a decline if adjusted for inflation. In just four years it more than doubled again, hitting \$8.5 million in 1980 (a constant-dollar increase of about 25 percent). Even as the U.S. inflation rate eased, the average expense of moviemaking would continue to soar.[142] With the majors now routinely saturation booking in over a thousand theaters, it was becoming increasingly difficult for smaller outfits to secure the exhibition commitments needed to turn a profit. Double features were now literally historyâ ~almost impossible to find except at revival houses. One of the first leading casualties of the new economic regime was venerable B studio Allied Artists, which declared bankruptcy in April 1979.[143] In the late 1970s, AIP had turned to producing relatively expensive films like the very successful Amityville Horror and the disastrous Meteor in 1979. The studio was sold off and dissolved as a moviemaking concern by the end of 1980.[144]

Despite the mounting financial pressures, distribution obstacles, and overall risk, many genre movies from small studios and independent filmmakers were still reaching theaters. Horror was the strongest low-budget genre of the time, particularly in the slasher mode as with *The Slumber Party Massacre* (1982), written by feminist author Rita Mae Brown. The film was produced for New World on a budget of \$250,000.[145] At the beginning of 1983, Corman sold New World; New Horizons, later Concordeâ ~New Horizons, became his primary company. In 1984, New Horizons released a critically applauded movie set amid the punk scene written and directed by Penelope Spheeris. The *New York Times* review concluded: "Suburbia is a good genre film." [146]

Larry Cohen continued to twist genre conventions in pictures such as *Q* (aka *Q: The Winged Serpent*; 1982), described by critic Chris Petit as "the kind of movie that used to be indispensable to the market: an imaginative, popular, low-budget picture that makes the most of its limited resources, and in which people get on with the job instead of standing around talking about it." [147] In 1981, New Line put out *Polyester*, a John Waters movie with a small budget and an old-school exploitation gimmick: *Odorama*. That October *The Book of the Dead*, a gore-filled yet stylish horror movie made for less than \$400,000, debuted in Detroit.[148] Its writer, director, and co-executive producer, Sam Raimi, was a week shy of his twenty-second birthday; star and co-executive producer Bruce Campbell was twenty-three. It was picked up for distribution by New Line, retitled *The Evil Dead*, and became a hit. In the words of one newspaper critic, it was a "shoestring tour de force." [149]

One of the most successful 1980s B studios was a survivor from the heyday of the exploitation era, Troma Pictures, founded in 1974. Troma's most characteristic productions, including *Class of Nuke 'Em High* (1986), *Redneck Zombies* (1986), and *Surf Nazis Must Die* (1987), take exploitation for an absurdist spin. Troma's best-known production is *The Toxic Avenger* (1985); its hideous hero, affectionately known as Toxie, was featured in several sequels and a TV cartoon series.[150] One of the few successful B studio startups of the decade was Rome-based Empire Pictures, whose first production, *Ghoulies*, reached theaters in 1985. The video rental market was becoming central to B film economics: Empire's financial model relied on seeing a profit not from theatrical rentals, but only later, at the video store.[151] A number of Concordeâ ~New Horizon releases went this route as well, appearing only briefly in theaters, if at all. The growth of the cable television industry also helped support the low-budget film industry, as many B movies quickly wound up as "filler" material for 24-hour cable channels or were made expressly for that purpose.[152]

[edit] Decline of the B: 1990s

By 1990, the cost of the average U.S. film had passed \$25 million.[153] Of the nine films released that year to gross more than \$100 million at the U.S. box office, two would have been strictly B movie material before the late 1970s: *Teenage Mutant Ninja Turtles* and *Dick Tracy*. Three moreâ ~the science-fiction thriller *Total Recall*, the action-filled detective thriller *Die Hard 2*, and the year's biggest hit, the slapstick kiddie comedy *Home Alone*â ~were also far closer

to the traditional arena of the Bs than to classic A-list subject matter.[154] The growing popularity of home video and access to unedited movies on cable and satellite television along with real estate pressures were making survival more difficult for the sort of small or non-chain theaters that were the primary home of independently produced genre films.[155] Drive-in screens were rapidly disappearing from the American landscape.[156]

Surviving B movie operations adapted in different ways. Releases from Troma now frequently went straight to video. New Line, in its first decade, had been almost exclusively a distributor of low-budget independent and foreign genre pictures. With the smash success of exploitation veteran Wes Craven's original *Nightmare on Elm Street* (1984), whose nearly \$2 million cost it had directly backed, the company began moving steadily into higher-budget genre productions. In 1994, New Line was sold to the Turner Broadcasting System; it was soon being run as a mid-sized studio with a broad range of product alongside Warner Bros. within the Time Warner conglomerate.[157] The following year, Showtime launched *Roger Corman Presents*, a series of thirteen straight-to-cable movies produced by Concorde's New Horizons. A *New York Times* reviewer found that the initial installment qualified as "vintage Corman... spiked with everything from bared female breasts to a mind-blowing quote from Thomas Mann's *Death in Venice*." [158]

At the same time as exhibition venues for B films vanished, the independent film movement was burgeoning; among the results were various crossovers between the low-budget genre movie and the "sophisticated" arthouse picture. Director Abel Ferrara, who built a reputation with violent B movies such as *The Driller Killer* (1979) and *Ms. 45* (1981), made two works in the early nineties that marry exploitation-worthy depictions of sex, drugs, and general sleaze to complex examinations of honor and redemption: *King of New York* (1990) was backed by a group of mostly small production companies and the cost of *Bad Lieutenant* (1992), \$1.8 million, was financed totally independently.[159] Larry Fessenden's micro-budget monster movies, such as *No Telling* (1991) and *Habit* (1997), reframe classic genre subjects to explore issues of contemporary relevance.[160] The budget of David Cronenberg's *Crash* (1996), \$10 million, was not comfortably A-grade, but it was hardly B-level either. The film's imagery was another matter: "On its scandalizing surface, David Cronenberg's *Crash* suggests exploitation at its most disturbingly sick", wrote critic Janet Maslin.[161] Financed, like *King of New York*, by a consortium of production companies, it was picked up for U.S. distribution by Fine Line Features. This result mirrored the film's scrambling of definitions: Fine Line was a subsidiary of New Line, recently merged into the Time Warner empire—specifically, it was the old exploitation distributor's arthouse division.[162] *Pulp Fiction* (1994), directed by Quentin Tarantino on a \$8.5 million budget, became a hugely influential hit by crossing multiple lines, as James Mottram describes: "With its art house narrative structure, B-movie subject matter and Hollywood cast, the film is the axis for three distinct cinematic traditions to intersect." [163]

[edit] Transition II/The B movie in the digital age: 2000s

By the turn of the millennium, the average production cost of an American feature had already spent three years above the \$50 million mark.[153] In 2005, the top ten movies at the U.S. box office included three adaptations of children's fantasy novels (including one extending and another initiating a series), a child-targeted cartoon, a comic book adaptation, a sci-fi series installment, a sci-fi remake, and a *King Kong* remake.[164] It was a slow year for Corman: he produced just one movie, which had no American theatrical release, true of most of the pictures he had been involved in over the preceding decade.[165] As big-budget Hollywood movies further usurped traditional low-rent genres, the ongoing viability of the familiar brand of B movie was in grave doubt. *New York Times* critic A. O. Scott warned of the impending "extinction" of "the cheesy, campy, guilty pleasures" of the B picture, as "the schlock of the past has evolved into star-driven, heavily publicized, expensive mediocrities".[166]

On the other hand, recent industry trends suggest the reemergence of something like the traditional A-B split in major studio production, though with fewer "programmers" bridging the gap. According to a 2006 report by industry analyst Alfonso Marone, "The average budget for a Hollywood movie is currently around \$60 m, rising to \$100 m when the cost of marketing for domestic launch (USA only) is factored into the equation. However, we are now witnessing a polarisation of film budgets into two tiers: large productions (\$120â ~150 m) and niche features (\$5â ~20m). ... Fewer \$30â ~70 m releases are expected." [168] Fox launched a new subsidiary in 2006, Fox Atomic, to concentrate on teen-oriented genre films. The economic model was deliberately low-rent, at least by major studio standards. According to a Variety report, "Fox Atomic is staying at or below the \$10 million mark for many of its movies. It's also encouraging filmmakers to shoot digitallyâ ~a cheaper process that results in a grittier, teen-friendly look. And forget about stars. Of Atomic's nine announced films, not one has a big name". [169] The newfangled B movie division was shut down in 2009. [170]

As the Variety report suggests, recent technological advances greatly facilitate the production of truly low-budget motion pictures. Although there have always been economical means with which to shoot movies, including Super 8 and 16Â mm film, as well as video cameras recording onto analog videotape, these mediums could not rival the image quality of 35Â mm film. The development of digital cameras and postproduction methods now allow even low-budget filmmakers to produce films with excellent, and not necessarily "grittier", image quality and editing effects. As Marone observes, "the equipment budget (camera, support) required for shooting digital is approximately 1/10 that for film, significantly lowering the production budget for independent features. At the same time, [since the early 2000s], the quality of digital filmmaking has improved dramatically." [168] Independent filmmakers, whether working in a genre or arthouse mode, continue to find it difficult to gain access to distribution channels, though so-called digital end-to-end methods of distribution offer new opportunities. In a similar way, Internet sites such as YouTube have opened up entirely new avenues for the presentation of low-budget motion pictures. [171]

[edit] Associated terms

The terms C movie and the more common Z movie describe progressively lower grades of the B movie category. The terms drive-in movie and midnight movie, which emerged in association with specific historical phenomena, are now often used as synonyms for B movie. A more recently coined synonym is psychotronic movie.

[edit] C movie

The C movie is the grade of motion picture at the low end of the B movie, orâ ~in some taxonomiesâ ~simply below it. [172] In the 1980s, with the growth of cable television, the C grade began to be applied with increasing frequency to low-quality genre films used as filler programming for that market. The "C" in the term then does double duty, referring not only to quality that is lower than "B" but also to the initial c of cable. Helping to popularize the notion of the C movie was the TV series Mystery Science Theater 3000 (1988â ~99), which ran on national cable channels (first Comedy Central, then the Sci Fi Channel) after its first year. Updating a concept introduced by TV hostess Vampira over three decades before, MST3K presented cheap, low-grade movies, primarily science fiction of the 1950s and 1960s, along with running voiceover commentary highlighting the films' shortcomings. Director Ed Wood has been called "the master of the 'C-movie'" in this sense, although Z movie (see below) is perhaps even more applicable to his work. [173] The rapid expansion of niche cable and satellite outlets such as Sci Fi (with its Sci Fi Pictures) and HBO's genre channels in the 1990s and 2000s has meant an ongoing market for contemporary C pictures, many of them "direct to cable" moviesâ ~modestly budgeted genre films never released in theaters. [174]

[edit] Z movie

The term Z movie (or grade-Z movie) is used by some to characterize low-budget pictures with quality standards well below those of most B and even so-called C

movies. Most films referred to as Z movies are made on very small budgets by operations on the fringes of the commercial film industry. The micro-budget "quickies" of 1930s fly-by-night Poverty Row production houses may be thought of as Z movies *avant la lettre*.^[175] The films of director Ed Wood, such as *Glen or Glenda* (1953) and *Plan 9 from Outer Space* (1959)[^] frequently cited as one of the worst pictures ever made[^] exemplify the classic grade-Z movie. Latter-day Zs are often characterized by violent, gory, and/or sexual content and a minimum of artistic interest; much of this product is destined for the subscription TV equivalent of the grindhouse.^[176]

[edit] Psychotronic movie

Psychotronic movie is a term coined by film critic Michael J. Weldon[^] referred to by a fellow critic as "the historian of marginal movies"[^] to denote the sort of low-budget genre pictures that are generally disdained or ignored entirely by the critical establishment.^[177] Weldon's immediate source for the term was the Chicago cult film *The Psychotronic Man* (1980), whose titular character is a barber who develops the ability to kill using psychic energy. According to Weldon, "My original idea with that word is that it's a two-part word. 'Psycho' stands for the horror movies, and 'tronic' stands for the science fiction movies. I very quickly expanded the meaning of the word to include any kind of exploitation or B-movie."^[178] The term, popularized beginning in the 1980s with publications of Weldon's such as *The Psychotronic Encyclopedia of Film and Psychotronic Video* magazine, has subsequently been adopted by other critics and fans. Use of the term tends to emphasize a focus on and affection for those B movies that lend themselves to appreciation as camp.^[179]

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- [^] Hirschhorn (1999), pp. 9[^]10, 17.
- [^] Finler (2003), pp. 41[^]42; Balio (2003), p. 29.
- [^] See, e.g., Taves (1995), p. 320.
- [^] Balio (1995), p. 29. See also Schatz (1999), pp. 16, 324.
- [^] See Finler (2003), pp. 26, 41[^]43, 47[^]49.
- [^] Finler (2003), pp. 18[^]19.
- [^] Taves (1995), pp. 326[^]27.
- [^] See, e.g., Balio (1995), pp. 103[^]4.
- [^] Epstein (2005), p. 6. See also Schatz (1999), pp. 16[^]17.
- [^] a b Taves (1995), p. 325.
- [^] Taves (1995), p. 326.
- [^] Epstein (2005), p. 4.
- [^] a b c d Finler (2003), p. 42.
- [^] Taves (1995), p. 317. Taves (like this article) adopts the usage of "programmer" argued for by author Don Miller in his 1973 study *B Movies* (New York: Ballantine). As Taves notes, "the term programmer was used in a variety of different ways by reviewers" of the 1930s (p. 431, n. 8). Some present-day critics employ the Miller[^]Taves usage; others refer to any B movie from the Golden Age as a "programmer" or "program picture."
- [^] Balio (1995), p. 102.
- [^] Finler (2003), pp. 26, 111, 116.
- [^] Tuska (1999), pp. 183[^]84.
- [^] See Taves (1995), pp. 321[^]29.
- [^] Adapted from Finler (2003), p. 26.
- [^] See Taves (1995), p. 323; McCarthy and Flynn (1975), p. 20. In its peak year, 1937, Grand National did produce around twenty pictures of its own.
- [^] Taves (1995), p. 313.
- [^] Nachbar (1974), p. 2.
- [^] Tuska (1974), p. 37.
- [^] Taves (1995), pp. 327[^]28.
- [^] Taves (1995), p. 316.
- [^] See, e.g., Taves (1995), p. 318.
- [^] Quoted in Schatz (1999), p. 75.
- [^] Naremore (1998), p. 141.

^ Taves (1995), p. 328.
 ^ Schatz (1999), p. 73.
 ^ Schatz (1999), pp. 19â ^21, 45, 72, 160â ^63.
 ^ Schatz (1999), p. 16.
 ^ Schatz (1993), p. 11.
 ^ See, e.g., Finler (2003), pp. 4, 6.
 ^ Jewell (1982), 181; Lasky (1989), 184â ^85.
 ^ Schatz (1999), p. 78.
 ^ Schatz (1999), pp. 340â ^41.
 ^ Schatz (1999), p. 295; Naremore (1998), p. 142.
 ^ Robert Smith ("Mann in the Dark," *Bright Lights* 2, no. 1 [fall 1976]), quoted in Ottoson (1981), p. 145.
 ^ Schatz (1999), p. 173, table 6.3.
 ^ Schatz (1999), p. 232; Finler (2003), pp. 219â ^20.
 ^ Finler (2003), p. 216.
 ^ See, e.g., Dave Kehr, "Critic's Choice: New DVD's," *The New York Times*, August 22, 2006; Dave Kehr, "Critic's Choice: New DVD's," *The New York Times*, June 7, 2005; Robert Sklar, "Film Noir Lite: When Actions Have No Consequences," *The New York Times*, "Week in Review," June 2, 2002.
 ^ Jewell (1982), pp. 218, 219.
 ^ For a detailed consideration of classic B noir, see Lyons (2000).
 ^ Finler (2003), pp. 214â ^15.
 ^ Jewell (1982), p. 147.
 ^ Schatz (1999), p. 175.
 ^ Naremore (1998), p. 144.
 ^ See Mank (2001), p. 274.
 ^ Strawn (1974), p. 257.
 ^ Lev (2003), p. 205.
 ^ Lasky (1989), p. 229.
 ^ See Finler (2003), pp. 357â ^58, for top films. Finler lists *The Country Girl* as 1955, when it made most of its money, but it premiered in December 1954. *The Seven Year Itch* replaces it in this analysis (the two films happen to be virtually identical in length).
 ^ See, e.g., Matthews (2007), p. 92; Lyons (2000), p. 53.
 ^ Lev (2003), pp. 60â ^61.
 ^ Hurd (2007), pp. 10â ^13.
 ^ Muller (1998), p. 176; Cousins (2004), p. 198.
 ^ Jewell (1982), p. 272.
 ^ Maltby (2000).
 ^ Schrader (1972), p. 61; Silver (1995).
 ^ Shapiro (2002), p. 96. See also *Atomic Films: The CONELRAD* 100.
 ^ Kinnard (1988), pp. 67â ^73.
 ^ Lev (2003), pp. 186, 184; Braucourt (1970), p. 75.
 ^ Auty (2005), p. 34. See also Shapiro (2002), pp. 120â ^24.
 ^ Strawn (1974), p. 259; Lev (2003), p. 206.
 ^ Lentz (2002), p. 17.
 ^ Cook (2000), p. 324. See also p. 171.
 ^ Denisoff and Romanowski (1991), pp. 64â ^65, 95â ^100, 105.
 ^ Di Franco (1979), p. 3.
 ^ Corman (1998), p. 36. It appears Corman made at least one true B pictureâ ~according to Arkoff, *Apache Woman*, to Corman's displeasure, was handled as a second feature (Strawn [1974], p. 258).
 ^ Rausch and Dequina (2008), p. 56.
 ^ Heffernan (2004), pp. 102â ^4.
 ^ Heffernan (2004), pp. 95â ^98.
 ^ Segrave (1992), p. 33.
 ^ Heffernan (2004), p. 161.
 ^ Matthews (2007), p. 91.
 ^ a b Cook (2000), p. 324.
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^ Hirschhorn (1979), p. 343.
 ^ Thompson (1960).
 ^ Quoted in Di Franco (1979), p. 97.
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 ^ Frasier (1997), pp. 7â ^8, 13.
 ^ Frasier (1997), pp. 9â ^11, 90; Denisoff and Romanowski (1991), pp. 116â ^18.
 ^ Frank (1998), p. 186; McGilligan (1996), p. 183.
 ^ a b Cook (2000), p. 222.
 ^ Paul (1994), p. 33.
 ^ Rockoff (2002), pp. 32â ^33.
 ^ Langford (2005), p. 175.
 ^ Heffernan (2004), p. 221; Cook (2002), pp. 70â ^71.
 ^ Cook (2000), pp. 222â ^23.
 ^ Heffernan (2004), pp. 190, 200â ^1.
 ^ Cook (2000), p. 223.
 ^ Canby (1969).
 ^ Di Franco (1979), pp. 162, 165.
 ^ See, e.g., Mathijs and Mendik (2008), p. 167; James (2005), pp. 282, 398;
 Cagin and Dray (1984), pp. 66â ^67.
 ^ Cagin and Dray (1984), pp. 61â ^66.
 ^ Financial figures per associate producer William L. Hayward, cited in Biskind (1998), p. 74.
 ^ Cagin and Dray (1984), p. 53.
 ^ See Finler (2003), p. 359, for top films. Finler lists *Hello, Dolly!* as 1970, when it made most of its money, but it premiered in December 1969. The *Owl and the Pussycat*, 51 minutes shorter, replaces it in this analysis.
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 ^ Denby (1985), p. 52.
 ^ Finler (2003), p. 42. Prince (2002) gives \$9 million as the average production cost in 1980, and a total of \$13 million after adding on costs for manufacturing exhibition prints and marketing (p. 20). See also p. 21, chart 1.2. The Box Office Mojo website gives \$9.4 million as the 1980 production figure; see "Movie Box Office Results by Year, 1980â ^Present". Box Office Mojo. Archived from the original on 30 December 2006.
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[edit] External links
Interviews of B movie professionals

Saint Gregory of Nazianzus

Icon of St. Gregory the Theologian
Fresco from Kariye Camii, Istanbul, Turkey
Theologian, Doctor of the Church, Great Hierarch, Cappadocian Father, Ecumenical Teacher

Born

AD 329Arianzum, Cappadocia

Died

25 January 389 / 390

Arianzum, Cappadocia

Honored in

Eastern Christianity, Western Christianity and Oriental Orthodoxy

Canonized

pre-congregation

Major shrine

Patriarchal Cathedral of St. George in the Fanar

Feast

Eastern Orthodox Church: January 25 (primary feast day)

January 30 (Three Great Hierarchs)Roman Catholic Church: January 2 (c.

1500–1969 May 9)Anglican Communion: January 2Lutheran Church: January 10

Attributes

Vested as a bishop, wearing an omophorion; holding a Gospel Book or scroll.

Iconographically, he is depicted as balding with a bushy white beard.

Gregory of Nazianzus (Greek: Γρηγόριος ὁ Θεολόγος Grēgorios ho Nazianzōnos; c. 329[1] – January 25 389 or 390[1]), also known as Gregory the Theologian or Gregory Nazianzen, was a 4th-century Archbishop of Constantinople. He is widely considered the most accomplished rhetorical stylist of the patristic age.[2]:xxi As a classically trained orator and philosopher he infused Hellenism into the early church, establishing the paradigm of Byzantine theologians and church officials.[2]:xxiv

Gregory made a significant impact on the shape of Trinitarian theology among both Greek- and Latin-speaking theologians, and he is remembered as the "Trinitarian Theologian". Much of his theological work continues to influence modern theologians, especially in regard to the relationship among the three Persons of the Trinity. Along with the brothers Basil the Great and Gregory of Nyssa, he is known as one of the Cappadocian Fathers.

Gregory is a saint in both Eastern and Western Christianity. In the Roman Catholic Church he is numbered among the Doctors of the Church; in Eastern Orthodoxy and the Eastern Catholic Churches he is revered as one of the Three Holy Hierarchs, along with Basil the Great and John Chrysostom.

[edit] Biography

[edit] Early life and education

Gregory was born in the family estate of Karbala outside the village of Arianzus, near Nazianzus, in southwest Cappadocia.[3]:18 His parents, Gregory and Nonna, were wealthy land-owners. In AD 325 Nonna converted her husband (an hyspistarian) to Christianity; he was subsequently ordained as bishop of Nazianzus in 328 or 329.[2]:vii The young Gregory and his brother, Caesarius, first studied at home with their uncle Amphylokhios. Gregory went on to study advanced rhetoric and philosophy in Nazianzus, Caesarea, Alexandria and Athens. On the way to Athens his ship encountered a violent storm, and the terrified

Gregory prayed to Christ that if he would deliver him, he would dedicate his life to His service.[2]:28 While at Athens, he developed a close friendship with his fellow student Basil of Caesarea and also made the acquaintance of Flavius Claudius Julianus, who would later become the emperor known as Julian the Apostate.[3]:19,25 In Athens, Gregory studied under the famous rhetoricians Himerius and Proaeresius.[4] Upon finishing his education, he taught rhetoric in Athens for a short time.

[edit] Priesthood

In 361 Gregory returned to Nazianzus and was ordained a presbyter by his father, who wanted him to assist with caring for local Christians.[2]:99â ^102 The younger Gregory, who had been considering a monastic existence, resented his father's decision to force him to choose between priestly services and a solitary existence, calling it an "act of tyranny".[3]:32[5] Leaving home after a few days, he met his friend Basil at Annesoi, where the two lived as ascetics.[2]:102 However, Basil urged him to return home to assist his father, which he did for the next year. Arriving at Nazianzus, Gregory found the local Christian community split by theological differences and his father accused of heresy by local monks.[2]:107 Gregory helped to heal the division through a combination of personal diplomacy and oratory.

By this time Emperor Julian had publicly declared himself in opposition to Christianity.[2]:115 In response to the emperor's rejection of the Christian faith, Gregory composed his *Invectives Against Julian* between 362 and 363. *Invectives* asserts that Christianity will overcome imperfect rulers such as Julian through love and patience. This process as described by Gregory is the public manifestation of the process of deification (theosis), which leads to a spiritual elevation and mystical union with God.[2]:121 Julian resolved, in late 362, to vigorously prosecute Gregory and his other Christian critics; however, the emperor perished the following year during a campaign against the Persians.[2]:125â ^6 With the death of the emperor, Gregory and the Eastern churches were no longer under the threat of persecution, as the new emperor Jovian was an avowed Christian and supporter of the church.[2]:130

Gregory spent the next few years combating Arianism, which threatened to divide the region of Cappadocia. In this tense environment, Gregory interceded on behalf of his friend Basil with Bishop Eusebius of Caesarea (Maritima).[2]:138â ^42 The two friends then entered a period of close fraternal cooperation as they participated in a great rhetorical contest of the Caesarean church precipitated by the arrival of accomplished Arian theologians and rhetors.[2]:143 In the subsequent public debates, presided over by agents of the Emperor Valens, Gregory and Basil emerged triumphant. This success confirmed for both Gregory and Basil that their futures lay in administration of the Church.[2]:143 Basil, who had long displayed inclinations to the episcopacy, was elected bishop of the see of Caesarea in Cappadocia in 370.

[edit] Episcopate in Sasima and Nazianzus

Gregory was ordained Bishop of Sasima in 372 by Basil.[2]:190â ^5 Basil created this see in order to strengthen his position in his dispute with Anthimus, bishop of Tyana.[4] The ambitions of Gregory's father to have his son rise in the Church hierarchy and the insistence of his friend Basil convinced Gregory to accept this position despite his reservations. Gregory would later refer to his episcopal ordination as forced upon him by his strong-willed father and Basil.[2]:187â ^92 Describing his new bishopric, Gregory lamented how it was nothing more than an "utterly dreadful, pokey little hole; a paltry horse-stop on the main roadÂ ... devoid of water, vegetation, or the company of gentlemenÂ ... this was my Church of Sasima!"[6] He made little effort to administer his new diocese, complaining to Basil that he preferred instead to pursue a contemplative life.[3]:38â ^9

By late 372 Gregory returned to Nazianzus to assist his dying father with the administration of his diocese.[2]:199 This strained his relationship with Basil, who insisted that Gregory resume his post at Sasima. Gregory retorted that he had no intention to continue to play the role of pawn to advance Basil's interests.[7] He instead focused his attention on his new duties as

co-adjutor of Nazianzus. It was here that Gregory preached the first of his great episcopal orations.

Following the deaths of his mother and father in 374, Gregory continued to administer the Diocese of Nazianzus but refused to be named bishop. Donating most of his inheritance to the needy, he lived an austere existence.[4] At the end of 375 he withdrew to a monastery at Seleukia, living there for three years. Near the end of this period his friend Basil died. Although Gregory's health did not permit him to attend the funeral, he wrote a heartfelt letter of condolence to Basil's brother, Gregory of Nyssa and composed twelve memorial poems dedicated to the memory of his departed friend.

[edit] Gregory at Constantinople

Emperor Valens died in 378. The accession of Theodosius I, a steadfast supporter of Nicene orthodoxy, was good news to those who wished to purge Constantinople of Arian and Apollinarian domination.[2]:235 The exiled Nicene party gradually returned to the city. From his deathbed, Basil reminded them of Gregory's capabilities and likely recommended his friend to champion the trinitarian cause in Constantinople.[2]:235â ^6[8]

In 379, the Antioch synod and its archbishop, Meletios, asked Gregory to go to Constantinople to lead a theological campaign to win over that city to Nicene orthodoxy.[3]:42 After much hesitation, Gregory agreed. His cousin Theodosia offered him a villa for his residence; Gregory immediately transformed much of it into a church, naming it Anastasia, "a scene for the resurrection of the faith".[2]:241[9] From this little chapel he delivered five powerful discourses on Nicene doctrine, explaining the nature of the Trinity and the unity of the Godhead.[4] Refuting the Eunomion denial of the Holy Spirit's divinity, Gregory offered this argument:

Look at these facts: Christ is born, the Holy Spirit is His Forerunner. Christ is baptized, the Spirit bears witness to this... Christ works miracles, the Spirit accompanies them. Christ ascends, the Spirit takes His place. What great things are there in the idea of God which are not in His power? What titles appertaining to God do not apply also to Him, except for Unbegotten and Begotten? I tremble when I think of such an abundance of titles, and how many Names they blaspheme, those who revolt against the Spirit![10]

Gregory's homilies were well received and attracted ever-growing crowds to Anastasia. Fearing his popularity, his opponents decided to strike. On the vigil of Easter in 379, an Arian mob burst into his church during worship services, wounding Gregory and killing another bishop. Escaping the mob, Gregory next found himself betrayed by his erstwhile friend, the philosopher Maximus the Cynic. Maximus, who was in secret alliance with Peter, bishop of Alexandria, attempted to seize Gregory's position and have himself ordained bishop of Constantinople.[3]:43 Shocked, Gregory decided to resign his office, but the faction faithful to him induced him to stay and ejected Maximus.

However, the episode left him embarrassed and exposed him to criticism as a provincial simpleton unable to cope with intrigues of the imperial city.[3]:43

Affairs in Constantinople remained confused as Gregory's position was still unofficial and Arian priests occupied many important churches. The arrival of the emperor Theodosius in 380 settled matters in Gregory's favor. The emperor, determined to eliminate Arianism, expelled Bishop Demophilus. Gregory was subsequently enthroned as bishop of Constantinople at the Basilica of the Apostles, replacing Demophilus.[3]:45

[edit] Second Ecumenical Council and retirement to Arianzum

Theodosius wanted to further unify the entire empire behind the orthodox position and decided to convene a church council to resolve matters of faith and discipline.[3]:45 Gregory was of similar mind, wishing to unify Christianity. In the spring of 381 they convened the Second Ecumenical Council in Constantinople, which was attended by 150 Eastern bishops. After the death of the presiding bishop, Meletius of Antioch, Gregory was selected to lead the Council. Hoping to reconcile the West with the East, he offered to recognize

Paulinus as Patriarch of Antioch. The Egyptian and Macedonian bishops who had supported Maximus's ordination arrived late for the Council. Once there, they refused to recognise Gregory's position as head of the church of Constantinople, arguing that his transfer from the See of Sasima was canonically illegitimate.[2]:358â ^9

Gregory was physically exhausted and worried that he was losing the confidence of the bishops and the emperor.[2]:359 Rather than press his case and risk further division, he decided to resign his office: "Let me be as the Prophet Jonah! I was responsible for the storm, but I would sacrifice myself for the salvation of the ship. Seize me and throw meâ ... I was not happy when I ascended the throne, and gladly would I descend it." [11] He shocked the Council with his surprise resignation and then delivered a dramatic speech to Theodosius asking to be released from his offices. The emperor, moved by his words, applauded, commended his labor and granted his resignation. The Council asked him to appear once more for a farewell ritual and celebratory orations. Gregory used this occasion to deliver a final address (Or. 42) and then departed.[2]:361

Returning to his homeland of Cappadocia, Gregory once again resumed his position as bishop of Nazianzus. He spent the next year combating the local Appollinarian heretics and struggling with periodic illness. He also began composing *De Vita Sua*, his autobiographical poem.[3]:50 By the end of 383 he found his health too feeble to cope with episcopal duties. Gregory established Eulalius as bishop of Nazianzus and then withdrew into the solitude of Arianzum. After enjoying five peaceful years in retirement at his family estate, he died on January 25 in 389.

Throughout his life Gregory faced stark choices. Should he pursue studies as a rhetor or philosopher? Would a monastic life be more appropriate than public ministry? Was it better to blaze his own path or follow the course mapped for him by his father and Basil? Gregory's writings illuminate the conflicts which both tormented and motivated him. Biographers suggest that it was this dialectic which defined him, forged his character and inspired his search for meaning and truth.[3]:54

[edit] Legacy

[edit] Theological and other works

Gregory's most significant theological contributions arose from his defense of the doctrine of the Trinity. He is especially noted for his contributions to the field of pneumatologyâ ~that is, theology concerning the nature of the Holy Spirit.[12] In this regard, Gregory is the first to use the idea of procession to describe the relationship between the Spirit and the Godhead: "The Holy Spirit is truly Spirit, coming forth from the Father indeed but not after the manner of the Son, for it is not by generation but by procession, since I must coin a word for the sake of clearness." [13] Although Gregory does not fully develop the concept, the idea of procession would shape most later thought about the Holy Spirit.[14]

He emphasized that Jesus did not cease to be God when he became a man, nor did he lose any of his divine attributes when he took on human nature. Furthermore, Gregory asserted that Christ was fully human, including a full human soul. He also proclaimed the eternality of the Holy Spirit, saying that the Holy Spirit's actions were somewhat hidden in the Old Testament but much clearer since the ascension of Jesus into Heaven and the descent of the Holy Spirit at the feast of Pentecost.

In contrast to the Neo-Arian belief that the Son is *ahomoios*, or "unlike" the Father, and with the Semi-Arian assertion that the Son is *homoiousios*, or "like" the Father, Gregory and his fellow Cappadocians maintained the Nicæan doctrine of *homoousia*, or consubstantiality of the Son with the Father.[15]:9,10 The Cappadocian Fathers asserted that God's nature is unknowable to man; helped to develop the framework of hypostases, or three persons united in a single Godhead; illustrated how Jesus is the *eikon* of the Father; and explained the concept of *theosis*, the belief that all Christians can be assimilated with God in "imitation of the incarnate Son as the divine

model."[15]:10

Some of Gregory's theological writings suggest that, like his friend Gregory of Nyssa, he may have supported some form of the doctrine of apocatastasis, the belief that God will bring all of creation into harmony with the Kingdom of Heaven.[16] This led some late-nineteenth century Christian universalists, notably J. W. Hanson and Philip Schaff, to describe Gregory's theology as universalist.[17] This view of Gregory is also held by some modern theologians, such as John Sachs who said that Gregory had "leanings" toward apocatastasis, but in a "cautious, undogmatic" way.[18] However, it is not clear or universally accepted that Gregory held to the doctrine of apocatastasis.[19]

Apart from the several theological discourses, Gregory was also one of the most important early Christian men of letters, a very accomplished orator, perhaps one of the greatest of his time,[15]:21 and also a very prolific poet, writing several poems with theological and moral matter and some with biographical content, about himself and about his friends (one short poem, "Eis ta Emmetra", actually lays down some rules for the composition of poetry).

[edit] Influence

Gregory's great nephew Nichobulos served as his literary executor, preserving and editing many of his writings. A cousin, Eulalios, published several of Gregory's more noteworthy works in 391.[2]:xi By 400, Rufinius began translating his orations into Latin. As Gregory's works circulated throughout the empire they influenced theological thought. His orations were cited as authoritative by the First Council of Ephesus in 431. By 451 he was designated Theologus, or Theologian by the Council of Chalcedon[2]:xi ~ a title held by no others save John the Apostle[4] and Symeon the New Theologian. He is widely quoted by Eastern Orthodox theologians and highly regarded as a defender of the Christian faith. His contributions to Trinitarian theology are also influential and often cited in the Western churches.[20]Paul Tillich credits Gregory of Nazianzus for having "created the definitive formulae for the doctrine of the trinity".[21] Additionally, the Liturgy of St Gregory the Theologian in use by the Coptic Church is named after him.[22]

[edit] Relics

Following his death, Saint Gregory was buried at Nazianzus. His relics were transferred to Constantinople in 950, into the Church of the Holy Apostles. Part of the relics were taken from Constantinople by Crusaders during the Fourth Crusade, in 1204, and ended up in Rome. On November 27, 2004, those relics, along with those of John Chrysostom, were returned to Istanbul (Constantinople) by Pope John Paul II, with the Vatican retaining a small portion of both. The relics are now enshrined in the Patriarchal Cathedral of St. George in the Fanar.[23]

[edit] Feast day

In the Western churches Gregory's feast day is on January 2.[24] The Eastern Orthodox Church and the Eastern Catholic Churches celebrate two feast days in honor of Gregory: January 25 as his primary feast and January 30, known as the feast of the Three Great Hierarchs, which commemorates him along with John Chrysostom and Basil of Caesarea.[25][26]

[edit] See also

^ a b Liturgy of the Hours Volume I, Proper of Saints, January 2.

^ a b c d e f g h i j k l m n o p q r s t u v w x y McGuckin, John (2001) Saint Gregory of Nazianzus: An Intellectual Biography, Crestwood, NY.

^ a b c d e f g h i j k Ruether, Rosemary Radford (1969), Gregory of Nazianzus: Rhetor and Philosopher, Oxford University Press

^ a b c d e Hunter-Blair, DO (1910), "Gregory of Nazianzus", The Catholic Encyclopedia, Robert Appleton

^ Migne, J.P. (ed), Patrologiae Graecae (PG), (1857â ^66), 37.1053, Carm. de vita sua, 1.345

^ Gregory, as quoted in PG 37.1059â ^60, De Vita Sua, vv. 439â ^46.

^ Gallay, P (1964) (in French), Grigoie de Nazianze, Paris, p.Â 61; quoting from Ep. 48, PG 37.97.

^ Orat. 43.2, PG 36.497.
 ^ 2 Kings 4:8 and Orat. 26.17, PG 35.1249.
 ^ of Nazianzus, Gregory, Or, The Orthodox Church of America, p. 31:29
 ^ PG, 37.1157â ^9, Carm. de vita sua, ll 1828â ^55.
 ^ Michael O'Carroll, "Gregory of Nazianzus" in Trinitas (Wilmington, DE: Michael Glazier, 1987).
 ^ Gregory of Nazianzus, Five Theological Orations, oration five. This fifth oration deals entirely with the Holy Spirit.
 ^ HEW Turner and Francis Young, "Procession(s)" in The Westminster Dictionary of Christian Theology, ed. A. Richardson & J. Bowden (Philadelphia: Westminster Press, 1983). Through Augustine, the idea would develop in the West into "double-procession," resulting in the Filioque clause and the split between Eastern and Western Christianity.
 ^ a b c B rtnes (2006).
 ^ "Apocatastasis". New Schaff-Herzog Encyclopedia of Religious Knowledge, Vol. I.
 ^ Hanson, JW Universalism: The Prevailing Doctrine Of The Christian Church During Its First Five Hundred Years. Chapter XV: Gregory Nazianzen. Boston and Chicago Universalist Publishing House, 1899.
 ^ Sachs, John R. "Apocatastasis in Patristic Theology." Theological Studies. 54 (December 1993), p. 632.
 ^ David L. Balas, "Apokatastasis" in The Encyclopedia of Early Christianity, second edition, ed. Everett Ferguson (New York: Garland Publishing, 1997), details Gregory of Nyssa's adherence to the doctrine, while making no mention of Nazianzen.
 ^ See how the 1992 edition of the Catechism of the Catholic Church cites a variety of Gregory's orations
 ^ Tillich, Paul. A History of Christian Thought (Simon and Schuster, 1968), p. 76.
 ^ Chaillot, Christine (2006). "The Ancient Oriental Churches". In Wainwright, Geoffrey. The Oxford history of Christian worship. Oxford New York: Oxford University Press. p. 139. ISBN 978-0-19-513886-3.
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http://books.google.com/books?id=rySr84jox_AC&pg=PA643&lpg=PA643&dq=gregory+the+theologian+feast+day&source=bl&ots=-0Xm4q72nF&sig=5S6DBQsa5i9tRw9QDhX-LUeaXUQ&hl=en&sa=X&ei=Fkd_ULf3E4iJqQH6oYDYDQ&ved=0CD4Q6AEwAzgK#v=onepage&q=gregory%20the%20theologian%20feast%20day&f=false. Retrieved 18 October 2012.
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[edit] External links

Persondata

Name

Gregory of Nazianzus

Alternative names

Gregory the Theologian, Gregory Nazianzen

Short description

Christian saint, bishop, and theologian

Date of birth

329

Place of birth

Arianzum, Cappadocia

Date of death

January 25, 389(389-01-25)

Place of death

Arianzum, Cappadocia

Matthew Boulton FRS (/Ë boÊ ltÉ n/; 3 September 1728Â â ^ 17 August 1809) was an English manufacturer and business partner of Scottish engineer James Watt. In the final quarter of the 18th century the partnership installed hundreds of Boulton & Watt steam engines, which were a great advance on the state of the art, making possible the mechanisation of factories and mills. Boulton applied modern techniques to the minting of coins, striking millions of pieces for Britain and other countries, and supplying the Royal Mint with up-to-date equipment.

Born in Birmingham, England in 1728, Boulton was the son of a Birmingham manufacturer of small metal products who died when Boulton was 31. By then Boulton had managed the business for several years, and thereafter expanded it considerably, consolidating operations at the Soho Manufactory, built by him near Birmingham. At Soho, he adopted the latest techniques, branching into silver plate, ormolu and other decorative arts. He became associated with James Watt when Watt's business partner, John Roebuck, was unable to pay a debt to Boulton, who accepted Roebuck's share of Watt's patent as settlement. He then successfully lobbied Parliament to extend Watt's patent for an additional 17 years, enabling the firm to market Watt's steam engine. The firm installed hundreds of Boulton & Watt steam engines in Britain and abroad, initially in mines and then in factories.

Boulton was a key member of the Lunar Society, a group of Birmingham-area men prominent in the arts, sciences, and theology. Members included Watt, Erasmus Darwin, Josiah Wedgwood and Joseph Priestley. The Society met each month near the full moon. Members of the Society have been given credit for developing concepts and techniques in science, agriculture, manufacturing, mining, and transport that laid the groundwork for the Industrial Revolution.

Boulton founded the Soho Mint, to which he soon adapted steam power. He sought to improve the poor state of Britain's coinage, and after several years of effort obtained a contract in 1797 to produce the first British copper coinage in a quarter century. His "cartwheel" pieces were well-designed and difficult to counterfeit, and included the first striking of the large copper British penny, which continued to be coined until decimalisation in 1971. He retired in 1800, though continuing to run his mint, and died in 1809. His image appears alongside James Watt on the Bank of England £50 note.

[edit] Background

Birmingham had long been a centre of the ironworking industry. In the early 18th century the town entered a period of expansion as iron working became easier and cheaper with the transition (beginning in 1709) from charcoal to coke as a means of smelting iron. Scarcity of wood in increasingly deforested England and discoveries of large quantities of coal in Birmingham's county of Warwickshire and the adjacent county of Staffordshire speeded the transition. Much of the iron was forged in small foundries near Birmingham, especially in the Black Country, including nearby towns such as Smethwick and West Bromwich. The resultant thin iron sheets were transported to factories in and around Birmingham. With the town far from the sea and great rivers and with canals not yet built, metalworkers concentrated on producing small, relatively valuable pieces, especially buttons and buckles. Frenchman Alexander Missen wrote that while he had seen excellent cane heads, snuff boxes and other metal objects in Milan, "the same can be had cheaper and better in Birmingham". These small objects came to be known as "toys", and their manufacturers as "toymakers".

Boulton was a descendant of families from around Lichfield, his great-great-great-great grandfather, Rev. Zachary Babington, having been Chancellor of Lichfield. Boulton's father, also named Matthew and born in 1700, moved to Birmingham from Lichfield to serve an apprenticeship, and in 1723 he married Christiana Piers. The elder Boulton was a toymaker with a small workshop specialising in buckles. Matthew Boulton was born in 1728, their third child and the second of that name, the first Matthew having died at the age of two in 1726.

[edit] Early and family life

The elder Boulton's business prospered after young Matthew's birth, and the family moved to the Snow Hill area of Birmingham, then a well-to-do neighbourhood of new houses. As the local grammar school was in disrepair Boulton was sent to an academy in Deritend, on the other side of Birmingham. At the age of 15 he left school, and by 17 he had invented a technique for inlaying enamels in buckles that proved so popular that the buckles were exported to France, then reimported to Britain and billed as the latest French developments.

On 3 March 1749 Boulton married Mary Robinson, a distant cousin and the daughter of a successful mercer, and wealthy in her own right. They lived briefly with the bride's mother in Lichfield, and then moved to Birmingham where the elder Matthew Boulton made his son a partner at the age of 21. Though the son signed business letters "from father and self", by the mid-1750s he was effectively running the business. The elder Boulton retired in 1757 and died in 1759.

The Bouldons had three daughters in the early 1750s, but all died in infancy. Mary Boulton's health deteriorated, and she died in August 1759. Not long after her death Boulton began to woo her sister Anne. Marriage with a deceased wife's sister was forbidden by ecclesiastical law, though permitted by common law. The union was opposed by Anne's brother Luke, who feared Boulton would control (and possibly dissipate) much of the Robinson family fortune. Nonetheless, they

married on 25 June 1760 at St. Mary's Church, Rotherhithe. Eric Delieb, who wrote a book on Boulton's silver, with a biographical sketch, suggests that the marriage celebrant, Rev. James Penfold, an impoverished curate, was probably bribed. Boulton later advised another man who was seeking to wed his late wife's sister: "I advise you to say nothing of your intentions but to go quickly and snugly to Scotland or some obscure corner of London, suppose Wapping, and there take lodgings to make yourself a parishioner. When the month is expired and the Law fulfilled, live and be happyÂ ... I recommend silence, secrecy, and Scotland."

The Boultons had two children, Matthew Robinson Boulton and Anne Boulton. In 1764 Luke Robinson died, and his estate passed to his sister Anne and thus into Matthew Boulton's control.

[edit] Innovator

[edit] Expansion of the business

After the death of his father in 1759, Boulton took full control of the family toymaking business. He spent much of his time in London and elsewhere, promoting his wares. He arranged for a friend to present a sword to Prince Edward, and the gift so interested the Prince's older brother, George, Prince of Wales, the future King George III, that he ordered one for himself.

With capital accumulated from his two marriages and his inheritance from his father, Boulton sought a larger site to expand his business. In 1761 he leased 13 acres (5.3Â ha) at Soho, then just in Staffordshire, with a residence, Soho House, and a rolling mill. Soho House was at first occupied by Boulton relatives, and then by his first partner, John Fothergill. In 1766 Boulton required Fothergill to vacate Soho House, and lived there himself with his family. Both husband and wife died there, Anne Boulton of an apparent stroke in 1783 and her husband after a long illness in 1809.

The 13 acres (5Â ha) at Soho included common land that Boulton enclosed, later decrying what he saw as the "idle beggarly" condition of the people who had used it. By 1765 his Soho Manufactory had been erected. The warehouse, or "principal building", had a Palladian front and 19 bays for loading and unloading, and had quarters for clerks and managers on the upper storeys. The structure was designed by local architect William Wyatt at a time when industrial buildings were commonly designed by engineers. Other buildings contained workshops. Boulton and Fothergill invested in the most advanced metalworking equipment, and the complex was admired as a modern industrial marvel. Although the cost of the principal building alone had been estimated at Â£2,000 (about Â£276,000 today);[22] the final cost was five times that amount. The partnership spent over Â£20,000 in building and equipping the premises. The partners' means were not equal to the total costs, which were met only by heavy borrowing and by artful management of creditors.

Among the products Boulton sought to make in his new facility were sterling silver plate for those able to afford it, and Sheffield plate, silver-plated copper, for those less well off. Boulton and his father had long made small silver items, but there is no record of large items in either silver or Sheffield plate being made in Birmingham before Boulton did so. To make items such as candlesticks more cheaply than the London competition, the firm made many items out of thin, die-stamped sections, which were shaped and joined together. One impediment to Boulton's work was the lack of an assay office in Birmingham. The silver toys long made by the family firm were generally too light to require assaying, but silver plate had to be sent over 70 miles (110Â km) to the nearest assay office, at Chester, to be assayed and hallmarked, with the attendant risks of damage and loss. Alternatively they could be sent to London, but this exposed them to the risk of being copied by competitors. Boulton wrote in 1771, "I am very desirous of becoming a great silversmith, yet I am determined not to take up that branch in the large way I intended, unless powers can be obtained to have a marking hall [assay office] at Birmingham." Boulton petitioned Parliament for the establishment of an assay office in Birmingham. Though the petition was bitterly opposed by London goldsmiths, he was successful in getting Parliament to pass an act establishing assay offices

in Birmingham and Sheffield, whose silversmiths had faced similar difficulties in transporting their wares. The silver business proved not to be profitable due to the opportunity cost of keeping a large amount of capital tied up in the inventory of silver. The firm continued to make large quantities of Sheffield plate, but Boulton delegated responsibility for this enterprise to trusted subordinates, involving himself little in it.

As part of Boulton's efforts to market to the wealthy, he started to sell vases decorated with ormolu, previously a French specialty. Ormolu was milled gold (from the French *or moulu*) amalgamated with mercury, and applied to the item, which was then heated to drive off the mercury, leaving the gold decoration. In the late 1760s and early 1770s there was a fashion among the wealthy for decorated vases, and he sought to cater to this craze. He initially ordered ceramic vases from his friend and fellow Lunar Society member Josiah Wedgwood, but ceramic proved unable to bear the weight of the decorations and Boulton chose marble and other decorative stone as the material for his vases. Boulton copied vase designs from classical Greek works and borrowed works of art from collectors, merchants, and sculptors. Fothergill and others searched Europe for designs for these creations. In March 1770 Boulton visited the Royal Family and sold several vases to Queen Charlotte, George III's wife. He ran annual sales at Christie's in 1771 and 1772. The Christie's exhibition succeeded in publicising Boulton and his products, which were highly praised, but the sales were not financially successful with many works left unsold or sold below cost. When the craze for vases ended in the early 1770s, the partnership was left with a large stock on its hands, and disposed of much of it in a single massive sale to Catherine the Great of Russia—the Empress described the vases as superior to French ormolu, and cheaper as well. Boulton continued to solicit orders, though "ormolu" was dropped from the firm's business description from 1779, and when the Boulton-Fothergill partnership was dissolved by the latter's 1782 death there were only 14 items of ormolu in the "toy room".

Among Boulton's most successful products were mounts for small Wedgwood products such as plaques, cameo brooches and buttons in the distinctive ceramics, notably jasper ware, for which Wedgwood's firm remains well known. The mounts of these articles, many of which have survived, were made of ormolu or cut steel, which had a jewel-like gleam.[38] Boulton and Wedgwood were friends, alternately cooperating and competing, and Wedgwood wrote of Boulton, "It doubles my courage to have the first Manufacturer in England to encounter with—The match likes me well—I like the Man, I like his spirit." [38]

In the 1770s Boulton introduced an insurance system for his workers that served as the model for later schemes, allowing his workers compensation in the event of injury or illness.[39] The first of its kind in any large establishment, employees paid one-sixtieth of their wages into the Soho Friendly Society, membership in which was mandatory. The firm's apprentices were poor or orphaned boys, trainable into skilled workmen; he declined to hire the sons of gentlemen as apprentices, stating that they would be "out of place" among the poorer boys.

Not all of Boulton's innovations proved successful. Together with painter Francis Eginton,[a] he created a process for the mechanical reproduction of paintings for middle-class homes, but eventually abandoned the procedure. Boulton and James Keir produced an alloy called "Eldorado metal" that they claimed would not corrode in water and could be used for sheathing wooden ships. After sea trials the Admiralty rejected their claims, and the metal was used for sashes at Soho House. Boulton feared that construction of a nearby canal would damage his water supply, but this did not prove to be the case, and in 1779 he wrote, "Our navigation goes on prosperously; the junction with the Wolverhampton Canal is complete, and we already sail to Bristol and to Hull."

[edit] Partnership with Watt

Boulton's Soho site proved to have insufficient hydropower for his needs, especially in the summer when the millstream's flow was greatly reduced. He realised that using a steam engine either to pump water back up to the millpond

or to drive equipment directly would help to provide the necessary power.[45] He began to correspond with Watt in 1766, and first met him two years later. In 1769 Watt patented an engine with the innovation of a separate condenser, making it far more efficient than earlier engines. Boulton realised not only that this engine could power his manufactory, but also that its production might be a profitable business venture.[46]

After receiving the patent, Watt did little to develop the engine into a marketable invention, turning to other work. In 1772, Watt's partner, Dr. John Roebuck, ran into financial difficulties, and Boulton, to whom he owed £1,200, accepted his two-thirds share in Watt's patent as satisfaction of the debt. Boulton's partner Fothergill refused to have any part in the speculation, and accepted cash for his share.[46] Boulton's share was worth little without Watt's efforts to improve his invention. At the time, the principal use of steam engines was to pump water out of mines. The engine commonly in use was the Newcomen steam engine, which consumed large amounts of coal and, as mines became deeper, proved incapable of keeping them clear of water. Watt's work was well known, and a number of mines that needed engines put off purchasing them in the hope that Watt would soon market his invention.

Boulton boasted about Watt's talents, leading to an employment offer from the Russian government, which Boulton had to persuade Watt to turn down. In 1774 he was able to convince Watt to move to Birmingham, and they entered into a partnership the following year. By 1775 six of the 14 years of Watt's original patent had elapsed, but thanks to Boulton's lobbying Parliament passed an act extending Watt's patent until 1800.[46] Boulton and Watt began work improving the engine. With the assistance of iron master John Wilkinson (brother-in-law of Lunar Society member Joseph Priestley), they succeeded in making the engine commercially viable.

In 1776 the partnership erected two engines, one for Wilkinson and one at a mine in Tipton in the Black Country. Both engines were successfully installed, leading to favourable publicity for the partnership. Boulton and Watt began to install engines elsewhere. The firm rarely produced the engine itself: it had the purchaser buy parts from a number of suppliers and then assembled the engine on-site under the supervision of a Soho engineer. The company made its profit by comparing the amount of coal used by the machine with that used by an earlier, less efficient Newcomen engine, and required payments of one-third of the savings annually for the next 25 years.[53] This pricing scheme led to disputes, as many mines fuelled the engines using coal of unmarketable quality that cost the mine owners only the expense of extraction.[53] Mine owners were also reluctant to make the annual payments, viewing the engines as theirs once erected, and threatened to petition Parliament to repeal Watt's patent.

The county of Cornwall was a major market for the firm's engines. It was mineral-rich and had many mines. However, the special problems for mining there, including local rivalries and high prices for coal, which had to be imported from Wales, forced Watt and later Boulton to spend several months a year in Cornwall overseeing installations and resolving problems with the mineowners. In 1779 the firm hired engineer William Murdoch,[b] who was able to take over the management of most of the on-site installation problems, allowing Watt and Boulton to remain in Birmingham.[53]

The pumping engine for use in mines was a great success. In 1782 the firm sought to modify Watt's invention so that the engine had a rotary motion, making it suitable for use in mills and factories. On a 1781 visit to Wales Boulton had seen a powerful copper-rolling mill driven by water, and when told it was often inoperable in the summer due to drought suggested that a steam engine would remedy that defect. Boulton wrote to Watt urging the modification of the engine, warning that they were reaching the limits of the pumping engine market: "There is no other Cornwall to be found, and the most likely line for increasing the consumption of our engines is the application of them to mills, which is certainly an extensive field." Watt spent much of 1782 on the modification project, and though he was concerned that few orders would result, completed it at the end of the year. One order was received in 1782, and

several others from mills and breweries soon after. George III toured the Whitbread brewery in London, and was impressed by the engine. As a demonstration, Boulton used two engines to grind wheat at the rate of 150Â bushels per hour in his new Albion Mill in London. While the mill was not financially successful, according to historian Jenny Uglow it served as a "publicity stunt par excellence" for the firm's latest innovation. Before its 1791 destruction by fire, the mill's fame, according to early historian Samuel Smiles, "spread far and wide", and orders for rotative engines poured in not only from Britain but from the United States and the West Indies.

Between 1775 and 1800 the firm produced approximately 450Â engines. It did not let other manufacturers produce engines with separate condensers, and approximately 1,000Â Newcomen engines, less efficient but cheaper and not subject to the restrictions of Watt's patent, were produced in Britain during that time.[63] Boulton boasted to James Boswell when the diarist toured Soho, "I sell here, sir, what all the world desires to haveâ ~POWER." The development of an efficient steam engine allowed large-scale industry to be developed,[65] and the industrial city, such as Manchester became, to exist.[66]

[edit] Involvement with coinage

By 1786, two-thirds of the coins in circulation in Britain were counterfeit, and the Royal Mint responded by shutting itself down, worsening the situation.[67] Few of the silver coins being passed were genuine. Even the copper coins were melted down and replaced with lightweight fakes. The Royal Mint struck no copper coins for 48Â years, from 1773 until 1821. The resultant gap was filled with copper tokens that approximated the size of the halfpenny, struck on behalf of merchants. Boulton struck millions of these merchant pieces.[70] On the rare occasions when the Royal Mint did strike coins, they were relatively crude, with quality control nonexistent.[67]

Boulton had turned his attention to coinage in the mid 1780s; they were just another small metal product like those he manufactured.[67] He also had shares in several Cornish copper mines, and had a large personal stock of copper, purchased when the mines were unable to dispose of it elsewhere. However, when orders for counterfeit money were sent to him, he refused them: "I will do anything, short of being a common informer against particular persons, to stop the malpractices of the Birmingham coiners." In 1788 he established the Soho Mint as part of his industrial plant. The mint included eight steam-driven presses, each striking between 70 and 84 coins per minute. The firm had little immediate success getting a license to strike British coins, but was soon engaged in striking coins for the British East India Company for use in India.[67]

The coin crisis in Britain continued. In a letter to the Master of the Mint, Lord Hawkesbury (whose son would become Prime Minister as Earl of Liverpool) on 14 April 1789, Boulton wrote:

In the course of my journeys, I observe that I receive upon an average two-thirds counterfeit halfpence for change at toll-gates, etc. and I believe the evil is daily increasing, as the spurious money is carried into circulation by the lowest class of manufacturers, who pay with it the principal part of the wages of the poor people they employ. They purchase from the subterraneous coiners 36 shillings'-worth of copper (in nominal value) for 20 shillings, so that the profit derived from the cheating is very large.

Boulton offered to strike new coins at a cost "not exceeding half the expense which the common copper coin hath always cost at his Majesty's Mint". He wrote to his friend, Sir Joseph Banks, describing the advantages of his coinage presses:

It will coin much faster, with greater ease, with fewer persons, for less expense, and more beautiful than any other machinery ever used for coiningÂ ... Can lay the pieces or blanks upon the die quite true and without care or practice and as fast as wanted. Can work night and day without fatigue by two

setts of boys. The machine keeps an account of the number of pieces struck which cannot be altered from the truth by any of the persons employed. The apparatus strikes an inscription upon the edge with the same blow that strikes the two faces. It strikes the [back]ground[c] of the pieces brighter than any other coining press can do. It strikes the pieces perfectly round, all of equal diameter, and exactly concentric with the edge, which cannot be done by any other machinery now in use.

Boulton spent much time in London lobbying for a contract to strike British coins, but in June 1790 the Pitt Government postponed a decision on recoinage indefinitely. Meanwhile, the Soho Mint struck coins for the East India Company, Sierra Leone and Russia, while producing high-quality planchets, or blank coins, to be struck by national mints elsewhere.[67] The firm sent over 20 million blanks to Philadelphia, to be struck into cents and half-cents by the United States Mint. Mint Director Elias Boudinot found them to be "perfect and beautifully polished".[67] The high-technology Soho Mint gained increasing and somewhat unwelcome attention: rivals attempted industrial espionage, while lobbying for Boulton's mint to be shut down.[67]

The national financial crisis reached its nadir in February 1797, when the Bank of England stopped redeeming its bills for gold. In an effort to get more money into circulation, the Government adopted a plan to issue large quantities of copper coins, and Lord Hawkesbury summoned Boulton to London on 3 March 1797, informing him of the Government's plan. Four days later, Boulton attended a meeting of the Privy Council, and was awarded a contract at the end of the month. According to a proclamation dated 26 July 1797, King George III was "graciously pleased to give directions that measures might be taken for an immediate supply of such copper coinage as might be best adapted to the payment of the laborious poor in the present exigency...which should go and pass for one penny and two pennies".[76] The proclamation required that the coins weigh one and two ounces respectively, bringing the intrinsic value of the coins close to their face value.[76] Boulton made efforts to frustrate counterfeiters. Designed by Heinrich Köhler, the coins featured a raised rim with incuse or sunken letters and numbers, features difficult for counterfeiters to match.[67] The twopenny coins measured exactly an inch and a half across; 16 pennies lined up would reach two feet.[67] The exact measurements and weights made it easy to detect lightweight counterfeits. Köhler also designed proportionate halfpennies and farthings; these were not authorised by the proclamation, and though pattern pieces were struck, they never officially entered circulation. The halfpenny measured ten to a foot, the farthing 12 to a foot.[67] The coins were nicknamed "cartwheels", both because of the size of the twopenny coin and in reference to the broad rims of both denominations. The penny was the first of its denomination to be struck in copper.

The cartwheel twopenny coin was not struck again; much of the mintage was melted down in 1800 when the price of copper increased and it had proved too heavy for commerce and was difficult to strike. Much to Boulton's chagrin, the new coins were being counterfeited in copper-covered lead within a month of issuance. Boulton was awarded additional contracts in 1799 and 1806, each for the lower three copper denominations. Though the cartwheel design was used again for the 1799 penny (struck with the date 1797), all other strikings used lighter planchets to reflect the rise in the price of copper, and featured more conventional designs. Boulton greatly reduced the counterfeiting problem by adding lines to the coin edges, and striking slightly concave planchets. Counterfeiters turned their sights to easier targets, the pre-Soho pieces, which were not withdrawn, due to the expense, until a gradual withdrawal took place between 1814 and 1817.

Watt, in his eulogy after Boulton's 1809 death, stated:

In short, had Mr. Boulton done nothing more in the world than he has accomplished in improving the coinage, his name would deserve to be

immortalised; and if it be considered that this was done in the midst of various other important avocations, and at enormous expense,â ~ for which, at the time, he could have had no certainty of an adequate return,â ~we shall be at a loss whether most to admire his ingenuity, his perseverance, or his munificence. He has conducted the whole more like a sovereign than a private manufacturer; and the love of fame has always been to him a greater stimulus than the love of gain. Yet it is to be hoped that, even in the latter point of view, the enterprise answered its purpose.

[edit] Activities and views

[edit] Scientific studies and the Lunar Society

Main article: Lunar Society

Boulton never had any formal schooling in science. His associate and fellow Lunar Society member James Keir eulogised him after his death:

Mr. [Boulton] is proof of how much scientific knowledge may be acquired without much regular study, by means of a quick & just apprehension, much practical application, and nice mechanical feelings. He had very correct notions of the several branches of natural philosophy, was master of every metallic art & possessed all the chemistry that had any relations to the object of his various manufactures. Electricity and astronomy were at one time among his favourite amusements.

From an early age, Boulton had interested himself in the scientific advances of his times. He discarded theories that electricity was a manifestation of the human soul, writing "we know tis matter & tis wrong to call it Spirit". He called such theories "Cymeras [chimeras] of each others Brain". His interest brought him into contact with other enthusiasts such as John Whitehurst, who also became a member of the Lunar Society. In 1758 the Pennsylvania printer Benjamin Franklin, the leading experimenter in electricity, journeyed to Birmingham during one of his lengthy stays in Britain; Boulton met him, and introduced him to his friends. Boulton worked with Franklin in efforts to contain electricity within a Leyden jar, and when the printer needed new glass for his "glassychord" (a mechanised version of musical glasses) he obtained it from Boulton.

Despite time constraints imposed on him by the expansion of his business, Boulton continued his "philosophical" work (as scientific experimentation was then called). He wrote in his notebooks observations on the freezing and boiling point of mercury, on people's pulse rates at different ages, on the movements of the planets, and on how to make sealing wax and disappearing ink. However, Erasmus Darwin, another fellow enthusiast who became a member of the Lunar Society, wrote to him in 1763, "As you are now become a sober plodding Man of Business, I scarcely dare trouble you to do me a favour in theâ ... philosophical way."

The Birmingham enthusiasts, including Boulton, Whitehurst, Keir, Darwin, Watt (after his move to Birmingham), potter Josiah Wedgwood and clergyman and chemist Joseph Priestley began to meet informally in the late 1750s. This evolved into a monthly meeting near the full moon, providing light to journey home afterwards, a pattern common for clubs in Britain at the time. The group eventually dubbed itself the "Lunar Society", and following the death of member Dr William Small in 1775, who had informally coordinated communication between the members, Boulton took steps to put the Society on a formal footing. They met on Sundays, beginning with dinner at 2 p.m., and continuing with discussions until at least 8.

While not a formal member of the Lunar Society, Sir Joseph Banks was active in it. In 1768 Banks sailed with Captain James Cook to the South Pacific, and took with him green glass earrings made at Soho to give to the natives. In 1776 Captain Cook ordered an instrument from Boulton, most likely for use in navigation. Boulton generally preferred not to take on lengthy projects, and he warned Cook that its completion might take years. In June 1776 Cook left on the

voyage on which he was killed almost three years later, and Boulton's records show no further mention of the instrument.

In addition to the scientific discussions and experiments conducted by the group, Boulton had a business relationship with some of the members. Watt and Boulton were partners for a quarter century. Boulton purchased vases from Wedgwood's pottery to be decorated with ormolu, and contemplated a partnership with him. Keir was a long-time supplier and associate of Boulton, though Keir never became his partner as he hoped.

In 1785 both Boulton and Watt were elected as Fellows of the Royal Society. According to Whitehurst, who wrote to congratulate Boulton, not a single vote was cast against him.

Though Boulton hoped his activities for the Lunar Society would "prevent the decline of a Society which I hope will be lasting", as members died or moved away they were not replaced. In 1813, four years after his death, the Society was dissolved and a lottery was held to dispose of its assets. Since there were no minutes of meetings, few details of the gatherings remain. Historian Jenny Uglow wrote of the lasting impact of the Society:

The Lunar Society[']s ... members have been called the fathers of the Industrial Revolution ... [T]he importance of this particular Society stems from its pioneering work in experimental chemistry, physics, engineering, and medicine, combined with leadership in manufacturing and commerce, and with political and social ideals. Its members were brilliant representatives of the informal scientific web which cut across class, blending the inherited skills of craftsmen with the theoretical advances of scholars, a key factor in Britain's leap ahead of the rest of Europe.

Boulton was widely involved in civic activities in Birmingham. His friend Dr John Ash had long sought to build a hospital in the town. A great fan of the music of Handel, Boulton conceived of the idea to hold a music festival in Birmingham to raise funds for the hospital. The festival took place in September 1768, the first of a series stretching well into the twentieth century. The hospital opened in 1779. Boulton also helped build the General Dispensary, where outpatient treatment could be obtained. A firm supporter of the Dispensary, he served as treasurer, and wrote, "If the funds of the institution are not sufficient for its support, I will make up the deficiency." The Dispensary soon outgrew its original quarters, and a new building in Temple Row was opened in 1808, shortly before Boulton's death.

Boulton helped found the New Street Theatre in 1774, and later wrote that having a theatre encouraged well-to-do visitors to come to Birmingham, and to spend more money than they would have otherwise. Boulton attempted to have the theatre recognised as a patent theatre with a Royal Patent, entitled to present serious drama; he failed in 1779 but succeeded in 1807. He also supported Birmingham's Oratorio Choral Society, and collaborated with button maker and amateur musical promoter Joseph Moore to put on a series of private concerts in 1799. He maintained a pew at St Paul's Church, Birmingham, a centre of musical excellence. When performances of the Messiah were organised at Westminster Abbey in 1784 in the (incorrect) belief it was the centennial of Handel's birth and the (correct) belief that it was the 25th anniversary of his death, Boulton attended and wrote, "I scarcely know which was grandest, the sounds or the scene. Both was transcendibly fine that it is not in my power of words to describe. In the grand Halleluja my soul almost ascended from my body."

Concerned about the level of crime in Birmingham, Boulton complained, "The streets are infested from Noon Day to midnight with prostitutes." In an era prior to the establishment of the police, Boulton served on a committee to organise volunteers to patrol the streets at night and reduce crime. He supported the local militia, providing money for weapons. In 1794 he was elected High Sheriff of Staffordshire, his county of residence.

Besides seeking to improve local life, Boulton took an interest in world affairs. Initially sympathetic to the cause of the rebellious American

colonists, Boulton changed his view once he realised that an independent America might be a threat to British trade, and in 1775 organised a petition urging the government to take a hard line with the Americansâ ~though when the revolution proved successful, he resumed trade with the former colonies. He was more sympathetic to the cause of the French Revolution, believing it justified, though he expressed his horror at the bloody excesses of the Revolutionary government. When war with France broke out, he paid for weapons for a company of volunteers, sworn to resist any French invasion.

[edit] Family and later life, death, and memorials

When Boulton was widowed in 1783 he was left with the care of his two teenage children. Neither his son Matthew Robinson Boulton nor his daughter Anne enjoyed robust health; the younger Matthew was often ill and was a poor student who was shuttled from school to school until he joined his father's business in 1790; Anne suffered from a diseased leg that prevented her from enjoying a full life. Despite his lengthy absences on business, Boulton cared deeply for his family. He wrote to his wife in January 1780,

Nothing could in the least palliate this long, this cold, this very distant separation from my dearest wife and children but the certain knowledge that I am preparing for their ease, happiness and prosperity, and when that is the prize, I know no hardships that I would not encounter with, to obtain it.

With the expiry of the patent in 1800 both Boulton and Watt retired from the partnership, each turning over his role to his namesake son. The two sons made changes, quickly ending public tours of the Soho Manufactory in which the elder Boulton had taken pride throughout his time in Soho. In retirement Boulton remained active, continuing to run the Soho Mint. When a new Royal Mint was built on Tower Hill in 1805, Boulton was awarded the contract to equip it with modern machinery. His continued activity distressed Watt, who had entirely retired from Soho, and who wrote to Boulton in 1804, "[Y]our friends fear much that your necessary attention to the operation of the coinage may injure your health".

Boulton helped deal with the shortage of silver, persuading the Government to let him overstrike the Bank of England's large stock of Spanish dollars with an English design. The Bank had attempted to circulate the dollars by countermarking the coins on the side showing the Spanish king with a small image of George III, but the public was reluctant to accept them, in part due to counterfeiting.[108] This attempt inspired the couplet, "The Bank to make their Spanish Dollars pass/Stamped the head of a fool on the neck of an ass." [108] Boulton obliterated the old design in his restriking.[108] Though Boulton was not as successful in defeating counterfeiters as he hoped (high quality fakes arrived at the Bank's offices within days of the issuance), these coins circulated until the Royal Mint again struck large quantities of silver coin in 1816, when Boulton's were withdrawn. He oversaw the final issue of his coppers for Britain in 1806, and a major issue of coppers to circulate only in Ireland. Even as his health failed, he had his servants carry him from Soho House to the Soho Mint, and he sat and watched the machinery, which was kept exceptionally busy in 1808 by the striking of almost 90,000,000 pieces for the East India Company. He wrote, "Of all the mechanical subjects I ever entered upon, there is none in which I ever engaged with so much ardour as that of bringing to perfection the art of coining."

By early 1809 he was seriously ill. He had long suffered from kidney stones, which also lodged in the bladder, causing him great pain. He died at Soho House on 17 August 1809. He was buried in the graveyard of St. Mary's Church, Handsworth, in BirminghamÂ â ^ the church was later extended over the site of his grave. Inside the church, on the north wall of the sanctuary, is a large marble monument to him, commissioned by his son, sculpted by the sculptor John Flaxman.[113] It includes a marble bust of Boulton, set in a circular opening above two putti, one holding an engraving of the Soho Manufactory.[113]

Boulton is recognised by several memorials and other commemorations in and

around Birmingham. Soho House, his home from 1766 until his death, is now a museum,[114] as is his first workshop, Sarehole Mill.[115] The Soho archives are at the Birmingham City Archives.[39] He is recognised by three blue plaques, at his Steelhouse Lane birthplace, at Soho House and at Sarehole Mill.[116] A gilded bronze statue of Boulton, Watt and Murdoch (1956) by William Bloye stands outside the old Register Office on Broad Street in central Birmingham.[117] Matthew Boulton College was named in his honour in 1957.[118] The two-hundredth anniversary of his death, in 2009, resulted in a number of tributes. Birmingham City Council promoted "a year long festival celebrating the life, work and legacy of Matthew Boulton".[119]

On 29 May 2009 the Bank of England announced that Boulton and Watt would appear on a new £50 note. The design is the first to feature a dual portrait on a Bank of England note, and presents the two industrialists side by side with images of a steam engine and Boulton's Soho Manufactory. Quotes attributed to each of the men are inscribed on the note: "I sell here, sir, what all the world desires to haveâ ~POWER" (Boulton) and "I can think of nothing else but this machine" (Watt).[120] In September 2011 it was announced that the notes would enter circulation on 2 November.[121]

In March 2009, Boulton was honoured with the issue of a Royal Mail postage stamp.[122]

Explanatory notes

- ^ Some sources spell the last name "Egginton".
- ^ Spelled "Murdock" in Andrew, but more commonly spelled Murdoch.
- ^ More accurately, the field.

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Persondata

Name

Boulton, Matthew

Alternative names

Short description

English manufacturer

Date of birth

1728-09-03

Place of birth

Birmingham, England

Date of death

1809-08-17

Place of death

Birmingham, England

This article is about the album by Slayer. For the book attributed to the fictional character from *Californication*, see Hank Moody.

God Hates Us All is the ninth studio album by American thrash metal band Slayer. Released on September 11, 2001, the album received positive critical reviews and entered the *Billboard* 200 at number 28. It was recorded in three months at The Warehouse Studio in Canada, and includes the Grammy Award-nominated "Disciple". The album is the band's last to feature drummer Paul Bostaph. Guitarist Kerry King wrote the majority of the lyrics, taking a different approach from earlier recordings by exploring topics such as religion, murder, revenge and self-control.

[edit] Recording

Slayer began writing lyrics for a new album prior to their appearance at the 1999 Ozzfest. However, every three to four months the band was distracted by commitments to Ozzfest, and worldwide "Tattoo the Earth" tour with Slipknot.[1] Guitarist Jeff Hanneman later admitted "that was the last break. Then we got our shit together." [2] The band's longtime producer, Rick Rubin, was too busy to work with Slayer, and felt "burned out" – unable to create intense music.[1] Araya and King had similar feelings about Rubin, and King remarked he "wanted to work with someone into the heavy-music scene, and Rubin's not anymore. I wanted somebody who knows what's hot, knows what's selling, knows the new techniques, and will keep me on my toes." [3] Rubin recommended two producers, although the first producer was not going to work out personality-wise according to Hanneman.[1] The band gave second candidate, Matt Hyde, a trial on the song "Bloodline", which appeared in the movie *Dracula 2000*. The band was pleased with Hyde's work on "Bloodline" and hired him to produce the entire album.[2] "Bloodline" was also briefly used in the 2009 film *Law Abiding*

Citizen. The song "Here Comes the Pain" had originally been recorded almost two years prior to the release of *God Hates Us All*, appearing on the compilation album *WCW Mayhem: The Music* in 1999, and then used as the opening theme for *WCW Thunder* from February 16, 2000 to the final episode on March 21, 2001.

God Hates Us All was to be recorded in a Hollywood studio; however, the band relocated to Vancouver, British Columbia due to the availability of cheaper studio time. Hyde recommended a studio to the bandâThe Warehouse Studio (owned by Bryan Adams) as he had previously worked there.[4] The studio was altered to make it "feel like home" for Slayer; as opposed to the setting for, in King's words, the "lightweight Canadian pop singer". This consisted of adding incense burners, candles, dimmed lights and pornography on the walls. Two banner flags of two middle fingers were also hung up. Vocalist Tom Araya says "that was basically the attitude of Slayer in the studio. We had a red devil head on one of the speakers. We had a skull on another. That's the kind of shit we put up. Spooky stuff that makes you feel at home." [2]

Hyde used the digital audio workstation Pro Tools during the engineering, production, and audio mixing stages of the album. Slayer members wanted to keep the use of computer effects to a minimum, only to include a small amount of delay and distortion.[1] As with previous recordings, the drum tracks were recorded first. Drummer Paul Bostaph follows a simple rule suggested by Rubin when in the studio: "The perfect take is the one that felt like it was going to fall apart but never did." Seven-string guitars were used on the tracks "Warzone" and "Here Comes the Pain," the first time Slayer had done so. King was at the B.C. Rich guitar company (manufacturer of his signature model, the KKV) and decided to borrow a seven string guitar. After writing one song, King ordered a seven string as he thought "there's no point having one tuning for just one song," so he wrote another, going on to comment "you don't have to be good to make up a seven-string riff." [2] So there are two 7-string tunings, 4 songs dropped to B and the rest in D#.[4]

[edit] Lyrical themes

God Hates Us All explores such themes as religion, murder, revenge, and self-control. King wrote a majority of the lyrics, which he based on "street" subjects which everyone could relate to, rather than "Satan this," "Satan that," and "the usual Dungeons & Dragons shit" from the band's previous records.[2] King told *Guitar World*:

I definitely wanted to put more realism in it, more depth. *God Hates Us All* isn't an anti-Christian line as much as it's an idea I think a lot of people can relate to on a daily basis. One day you're living your life, and then you're hit by a car or your dog dies, so you feel like, "God really hates me today." [3]

The song "Threshold" is about reaching one's limit with a person in a situation where one is about to breakâand are about to blow up as they get "under your skin", while "Cast Down" features a fallen Angel who falls into drugs.[2] "God Send Death" is based on a creature that killed in the past, while "Deviance" takes up the idea of killing people for pleasure. Both songs were written by Hanneman. Having read several books on serial killers, Hanneman came to the conclusion he could only kill someone if they really "pissed him off", and decided he was unable to kill someone he did not know just for power. He later admitted he was trying to get into that person's mind; "why do they get off on it? Without being angry, just killing for the sake of killing and getting off on it. I just wanted to get into that mindset." [5]

While other members went to local pubs, Araya spent his free hours reading factual books regarding serial killers, including Gordon Burn's *Happy Like Murderers: The Story of Fred and Rosemary West*. Araya was seeking inspiration, and aimed to sound convincing while singing the lyrics, avoiding himself to sound like a gimmick.[2] Araya sang the lyrics more "over-the-top" than done on previous albums, as King's writing style is more "aggro." [3] This resulted in *Kerrang!* reviewer Jason Arnopp describing the album's lyrics as "so packed with

foul and abusive language that it sounds as if D-12 and the Sopranos family were going head-to-head in a celebrity swearathon."[6]

[edit] Cover art and album title

God Hates Us All was originally intended to be named Soundtrack to the Apocalypse. However, Araya suggested that the title would be better used for a box set, which the band released in 2003.[7] The phrase God Hates Us All originates from the song "Disciple", during which the line is repeated over the chorus. The lyrics are in reference to God's allowance of acts such as suicide and terrorism, while seemingly doing nothing to prevent them[1][4] (see problem of evil). A member of the heavy metal band Pantera suggested using "God Hates Us All" for a shirt design after King played the song to the band. King agreed, although he thought the phrase would have more impact as the album title.[8]

The original album cover depicts a Bible spiked with nails placed in a pentagram star shape, covered in blood with the word "Slayer" burnt across it, while the liner notes feature Bible verses crossed out with a black marker. The idea was suggested by the band's record company, although King wanted more time to develop a better cover. He complained that the idea was typical of "a record company with absolutely no idea what the fuck they were going to do", and said that the cover "looked like a seventh grader defaced the Bible." King's concept for the cover was to show nails in the shape of a pentagram, and have them miss keywords in Bible verses so it appeared as if it had been created by a sociopath who knew where every word appears. A slip insert was placed in front of the covers in major retail outlets.[9]

[edit] Reception

God Hates Us All was set for release on July 10; however, concerns regarding audio mixing, the album cover, and the band's label's American Recordings's changing distributor, caused the release date to be delayed until September 11, 2001.[21] The release drew an unintended connection to the September 11 attacks, which was the second time Slayer caused controversy towards one of their releases's the video for "Seasons in the Abyss" was filmed in Egypt and released prior to the Gulf War.[4] In its week of release, God Hates Us All debuted at number 28 on the Billboard 200,[22] and sold 51,000 copies.[23] It entered the Canadian Albums Chart at number 9, and debuted at number 18 on the top Internet album chart.[24] As of August 16, 2006 the album has sold 304,000 copies in the United States.[23]

God Hates us All received generally positive reviews from music critics. On Metacritic, the album has a score of 80 out of 100 based on 12 reviews.[10] Kerrang!'s Jason Arnopp described the album as "easily Slayer's most convincing collection since Seasons in the Abyss," awarding the album five out of five.[6] Rolling Stone's Rob Kemp wrote the record was "Slayer's most brutal record since 1986's immortal (or undead) Reign in Blood," describing the music as "galloping double-bass-drum salvos" which "switch on a dime to furious double-time pummeling, as ominous power chords and jagged shred solos slice and dice with Formula One precision." Kemp awarded the album three and a half out of five.[18] AllMusic reviewer Jason Birchmeier commented that "nearly 20 years into their evolution, Slayer have abandoned the extravagancies and accessibility of their late-'80s/early-'90s work and returned to perfect the raw approach of their early years. A near flawless album," and that Araya's performance possibly makes "the most exhausting Slayer album yet." [11]

Not all critics were impressed with the album. Blabbermouth.net reviewer Borivoj Krgin dismissively labeled the album as "another failure on the band's part to take the initiative and reinvent themselves." Krgin described King as "the weaker and less inventive of the two main songwriters" (King and Hanneman), feeling the album followed "a familiar direction that almost always sounds tired and forced" as a result of King being the album's main songwriter. Krgin also singled out Araya for criticism, and called the vocalist a "hollow shell of his former self, boasting a singing style that is monotonous, devoid of creativity and at times virtually unlistenable." Krgin awarded the record 6 out of 10, and ended the review by observing that "Slayer's rapidly diminishing record sales (Diabolus In Musica has shifted less than 300,000 copies in the US

compared to 600â ^700,000+) as a sign that the band is in dire need of a new lease on life." [25] The Washington Post gave it a mixed review, stating, "Of course, what Slayer says isn't supposed to be nearly as important as how it says it: The riffs are all overdriven and suffocating, and that's a conscious decision. In its simplest form, a song like "Exile" could pass for Motorhead pushed through the blades of a lawn mower, but that's selling Slayer short; guitarist Kerry King actively fights the groove that naturally comes from playing heavy rock-and-roll." [26]

The song "Disciple" received a Grammy Award nomination for "Best Metal Performance" at the 44th Grammy Awards, the band's first nomination. The members cared neither about the nomination nor the award ceremony, and although they did not expect to win, thought it was "cool" to be nominated. [27] The ceremony took place on February 27, 2002, with Tool winning the award for their song "Schism". [28]

[edit] Bostaph's departure

Prior to Christmas 2001, Bostaph sustained a chronic elbow injury which hindered his ability to drum, resulting in his decision to leave the band. [29] His third-to-last performance with Slayer was recorded on War at the Warfield. To date, Bostaph has not viewed the footage; he has likened the experience to "breaking up with a girlfriend," and wants to move on with his life. [30] Bostaph does not regret his time spent with the band, and describes the period as a high point in his career. [31] Without a drummer the band were unable to finish their God Hates Us All tour. King contacted original drummer Dave Lombardo almost ten years after his departure, and asked him if he would be willing to play for the remainder of the tour. [32] Lombardo accepted the offer, and played for the remaining 21 shows; however, he did not take on a permanent position with the band. [31]

Following the tour, the band continued their search for a permanent drummer, and sought solicitation via demo tape and snail mail. Interested fans sent video recordings of renditions of the songs "Disciple," "God Send Death," "Stain of Mind," "Angel of Death", "Postmortem/Raining Blood," "South of Heaven," "War Ensemble," and "Seasons in the Abyss"; complete with rÃ©sumÃ©s. [33] The band listened to hundreds of demo tapes, and created a "good pile" and "ungood pile," though the "ungood" was much larger. Those whose performances the band were pleased with were offered an audition in Dallas, San Francisco or Peoria, Illinois; many applicants, however, were unable to attend due to flight costs. The band auditioned roughly two to three drummers a day, and their top choice was one of Lombardo's recommendations. [27] However, the band ultimately returned to Lombardo after deciding that they could not find a drummer who suited the job; Lombardo re-joined Slayer and attended music festivals worldwide to promote God Hates Us All and record drums on the 2006 album Christ Illusion. [32]

[edit] Track listing

1.
"Darkness of Christ" Â
Kerry King
Jeff Hanneman
1:30
2.
"Disciple" Â
King
Hanneman
3:35
3.
"God Send Death" Â
Tom Araya, Hanneman
Hanneman
3:45
4.
"New Faith" Â

King
King
3:05
5.
"Cast Down" Â
King
King
3:26
6.
"Threshold" Â
King
Hanneman
2:29
7.
"Exile" Â
King
King
3:55
8.
"Seven Faces" Â
King
King
3:41
9.
"Bloodline" Â
Araya, Hanneman
Hanneman, King
3:36
10.
"Deviance" Â
Araya, Hanneman
Hanneman
3:08
11.
"War Zone" Â
King
King
2:45
12.
"Here Comes the Pain" Â
King
King
4:32
13.
"Payback" Â
King
King
3:03

[edit] Bonus DVD materials
"Darkness of Christ" (DVD Intro video)
"Bloodline" (Video)
"Raining Blood" (Live Video) (2001-12-07 San Francisco, CA)
"Interview/B-Roll Footage
[edit] Personnel
[edit] References

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[edit] External links

Lake Burley Griffin

View across west basin from Acton Peninsula

Location

Canberra, Australian Capital Territory

Coordinates

35°17′23″S 149°06′25″E﻿ / ﻿35.29333°S 149.11389°E﻿ / -35.29333;

149.11389Coordinates: 35°17′23″S 149°06′25″E﻿ / ﻿35.29333°S 149.11389°E﻿ / -35.29333; 149.11389

Lake type

Artificial lake

Primary inflows

Molonglo River, Sullivans Creek, Jerrabomberra Creek

Primary outflows

Molonglo River

Catchment area

183.5 km² (70.8 sq mi) [1]

Basin countries

Australia

Max. length

11 km (6.8 mi)

Max. width

1.2 km (0.75 mi)

Surface area

6.64 km² (2.56 sq mi)

Average depth

4 m (13 ft)

Max. depth

18 m (59 ft)

Water volume

33,000,000 m³ (27,000 acre·ft)

Surface elevation

556 m (1,824 ft)

Islands

6 (Aspen, Springbank, Spinnaker, others unnamed)

Sections/sub-basins

East Basin, Central Basin, West Basin, West Lake and Tarcoola Reach, Yarramundi Reach

Settlements

Canberra

Lake Burley Griffin is an artificial lake in the centre of Canberra, the capital of Australia. It was completed in 1963 after the Molonglo River which ran between the city centre and Parliamentary Triangle was dammed. It is named after Walter Burley Griffin, the American architect who won the competition to design the city of Canberra.[2]

Griffin designed the lake with many geometric motifs, so that the axes of his design lined up with natural geographical landmarks in the area. However, government authorities changed his original plans and no substantial work was completed before he left Australia in 1920. His scheme remained unfulfilled as the Great Depression and World War II intervened, and it was not until the 1950s that planning resumed. After much political dispute over several proposed variations, excavation work began in 1960 with the energetic backing of Prime Minister Robert Menzies. After the completion of the bridges and dams, the dams were locked in September 1963. However, a drought meant that the target water level was not reached until April 1964. It was formally inaugurated on 17 October 1964.

The lake is located in the approximate geographic centre of the city, and is the centrepiece of the capital in accordance with Griffin's original designs. Numerous important institutions, such as the National Gallery, National Museum, National Library, Australian National University and the High Court were built on its shores, and Parliament House is a short distance away. Its surrounds, consisting mainly of parklands, are popular with recreational users, particularly in the warmer months. Though swimming in the lake is uncommon, it is used for a wide variety of other activities, such as rowing, fishing, and sailing.

The lake is an ornamental body with a length of 11 kilometres (6.8 mi); at its widest, it measures 1.2 kilometres (0.75 mi). It has an average depth of 4 metres (13 ft) and a maximum depth of about 18 metres (59 ft) near the Scrivener Dam. Its flow is regulated by the 33-metre (108 ft) tall Scrivener Dam, designed to handle floods that occur once in 5,000 years. In times of drought, water levels can be maintained through the release of water from Googong Dam, located on an upstream tributary of the Molonglo River.

[edit] Design history

Charles Robert Scrivener (1855–1923) recommended the site for Canberra in 1909, which was to be a planned capital city for the country. One of the reasons for the location's selection was its ability to store water "for ornamental purposes at reasonable cost";[3] Scrivener's work had demonstrated that the topography could be used to create a lake through flooding.[4]

In 1911, a competition for the design of Canberra was launched, and Scrivener's detailed survey of the area was supplied to the competing architects.[3] The Molonglo River flowed through the site, which was a flood plain[5] and Scrivener's survey showed in grey an area clearly representing an artificial lake similar to the lake later created and four possible locations for a dam to create it.[6][7] Most of the proposals took the hint and included artificial bodies of water.[3]

[edit] Walter Burley Griffin's design

The American architect Walter Burley Griffin won the contest and was invited to Australia to oversee the construction of the nation's new capital after the judges' decision was ratified by King O'Malley, the Minister for Home Affairs.[4][8] Griffin's proposal, which had an abundance of geometric patterns, incorporated concentric hexagonal and octagonal streets emanating from several radii.[9]

His lake design was at the heart of the city and consisted of a Central Basin in the shape of circular segment, a West and East Basin, which were both approximately circular, and a West and East Lake, which were much larger and irregularly shaped, at either side of the system.[10] The East Lake was supposed to be 6 metres (20 ft) higher than the remaining components.[11] Griffin's proposal was "the grandest scheme submitted, yet it had an appealing simplicity and clarity.[4]

The lakes were deliberately designed so that their orientation was related to various topographical landmarks in Canberra.[3][12] The lakes stretched from east to west and divided the city in two; a land axis perpendicular to the central basin stretched from Capital Hill to the future location of the new Parliament House on a mound on the southern side to the north northeast across the central basin to the northern banks along Anzac Parade to the Australian War Memorial (although a casino was originally planned in its place).[13] This was designed so that looking from Capital Hill, the War Memorial stood directly at the foot of Mount Ainslie. At the southwestern end of the land axis was Bimberi Peak.[12]

The straight edge of the circular segment that formed the central basin was designated the water axis, and it extended northwest towards Black Mountain,[12] the highest point in Canberra. A line parallel to the water axis, on the northern side of the city, was designated the municipal axis.[14] The municipal axis became the location of Constitution Avenue, which linked City Hill in Civic Centre and Market Centre. Commonwealth Avenue and Kings Avenue were to run from the southern side from Capital Hill to City Hill and Market Centre on the north respectively, and they formed the western and eastern edges of the central basin. The area enclosed by the three avenues was known as the Parliamentary Triangle, and was to form the centrepiece of Griffin's work.[14]

Later, Scrivener, as part of a government design committee, was responsible for modifying Griffin's winning design.[4][15][16] He recommended changing the shape of the lake from Griffin's very geometric shapes to a much more organic one using a single dam, unlike Griffin's series of weirs.[4][17] Griffin lobbied for the retention of the pure geometry, saying that they were "one of the reasons d'être of the ornamental waters", but he was overruled.[18] The new design included elements from several of the best design submissions and was widely criticised as being ugly. The new plan for the lake retained Griffin's three formal basins: east, central, and west, though in a more relaxed form.[2][17]

Griffin entered into correspondence with the government over the plan and its alternatives, and he was invited to Canberra to discuss the matter.[19] Griffin arrived in August 1913 and was appointed Federal Capital Director of Design and Construction for three years.[4][20]

The plans were varied again in the following years, but the design of Lake Burley Griffin remained based largely on the original committee's plan.[21] It was later gazetted and legally protected by the federal parliament in 1926,[22] based on a 1918 plan.[11] However, Griffin had a strained working relationship with the Australian authorities and a lack of federal government funding meant that by the time he left in 1920, little significant work had been done on the city.[8][21] A 1920s proposal to reduce West Lake into a ribbon of water was made on the basis of flood safety. However, the Owen and Peake report of 1929 ruled that the original design was hydrologically sound.[11]

[edit] Political disputes and modifications

With the onset of the Great Depression, followed by World War II, development of the new capital was slow,[23] and in the decade after the end of the war, Canberra was criticised for resembling a village,[13][23] and its disorganised

collection of buildings was deemed ugly.[24] Canberra was often derisively described as "several suburbs in search of a city".[25]

During this time, the Molonglo River flowed through the flood basin, with only a small fraction of the water envisaged in Griffin's plan.[26] The centre of his capital city consisted of mostly farmland, with small settlementsâ ~mostly wooden, temporary and ad hocâ ~on either side.[27] There was little evidence that Canberra was planned,[13] and the lake and Parliamentary Triangle at the heart of Griffin's plan was but a paddock.[13] Royal Canberra Golf Course, and Acton Racecourse and a sports ground were located on the pastoral land that was to become the West Lake, and people had to disperse the livestock before playing sport.[13] A rubbish dump stood on the northern banks of the location of central basin,[28] and no earth had been moved since Griffin's departure three decades earlier.[29]

In 1950, the East Lakeâ ~the largest componentâ ~was eliminated upon the advice of the National Capital Planning and Development Committee (NCPDC).[30] Today, what would have been the East Lake corresponds to the suburb of Fyshwick. The rationale given was that around 1,700 acres (690Â ha) of farmland would be submerged and that the Molonglo would have insufficient water to keep the lake filled.[30]

In 1953, the NCPDC excised the West Lake from its plans and replaced it with a winding stream,[31] which was 110 metres (360Â ft) wide and covered around a fifth of the original area.[32] As the NCPDC had only advisory powers, this change was attributed to the influence of senior officials in the Department of the Interior who felt that Griffin's plan was too grandiose.[33] Advocates of watered-down scheme thought it was more economical and saved 350 hectares (860Â acres) of land for development.[32] However, according to engineering reports that were ignored, the smaller plan would actually cost more money and require a more complicated structure of dams that would in any case be less able to prevent flooding.[34][35]

Initially, there was little opposition during the consultation period before the alterations were made.[32] However, opposition to the reduction of the water area grew.[31] The process that resulted in the alteration was criticised for being non-transparent and sneaky.[36] Some organisations complained that they were not given an opportunity to express their opinion before the change was gazetted,[37] and many politicians and the chief town planner were not informed.[38] Critics bitterly insinuated that politically influential members of the Royal Canberra Golf Club, whose course was situated on the location of the proposed West Lake, were responsible for the change in policy.[39]

The Parliamentary Public Works Committee advised the Parliament to restore the West Lake.[31] After an inquiry in late 1954, it concluded that:

The West Lake is desirable and practicable. It was eliminated from the Canberra plan by the Department of the Interior without adequate investigation by the National Capital Planning and Development Committee and replaced by a ribbon of water scheme involving a capitalised cost of nearly 3 million more. The lake should be restored to the plan, and the necessary Ministerial action is recommended as soon as possible.[40]

The Prime Minister, Robert Menzies,[41] regarded the state of the national capital as an embarrassment. Over time his attitude changed from one of contempt to that of championing its development. He fired two ministers charged with the development of the city, feeling that their performance lacked intensity.[42]

In 1958, the newly created National Capital Development Commission (NCDC), which had been created and given more power by Menzies following a 1955 Senate inquiry,[35] restored the West Lake to its plans,[43] and it was formally gazetted in October 1959.[40] The NCDC also blocked a plan by the Department of Works to build a bridge across the lake along the land axis between Parliament House and the War Memorial contrary to Griffin's plans.[44]

A powerful Senate Select Committee oversaw the NCDC and renowned British

architect Sir William Holford was brought in to fine-tune Griffin's original plans.[45] He changed the central basin's geometry so that it was no longer a segment of circle; he converted the southern straight edge into a polygonal shape with three edges and inserted a gulf on the northern shore.[46] The result was closer to Scrivener's modified design some decades earlier.[47]

[edit] Final layout

The lake contains 33,000,000 cubic metres (27,000Â acreÂ·ft) of water with a surface area of 6.64 square kilometres (2.56Â sqÂ mi). It is 11 kilometres (6.8Â mi) long, 1.2 kilometres (0.75Â mi) wide at its widest point, has a shoreline of 40.5 kilometres (25.2Â mi)[48][49] and a water level of 555.93 metres (1,823.9Â ft) above sea level.[50]

The lake is relatively shallow; the maximum depth is 17.6 metres (58Â ft) near the Scrivener Dam, and the average depth is 4.0 metres (13Â ft). The shallowest part of the complex is in the East Basin, which has an average depth of 1.9 metres (6.2Â ft). The minimum depth of the water at the walls is around 0.5 metres (1.6Â ft) and rock is placed at the toe of the wall to inhibit aquatic plant growth.[4][50]

Lake Burley Griffin contains six islands, three unnamed small islands and three larger named islands.[51] Of the larger islands, Aspen Island is located in Central Basin while Springbank and Spinnaker Island are located in the West Lake.[51] Aspen Island is connected to dry land by a footbridge,[52] and is the site of the Australian National Carillon.[53]

[edit] Construction

In 1958, engineers conducted studies into the hydrology and structural requirements needed for the building of the dam.[29] Further studies were done to model water quality, siltation, climate effects and change in land quality.[54] Modelling based on the data collection suggested that the water level could be kept within a metre of the intended level of 556 metres (1,824Â ft) above sea level in the case of a flood.[55][56]

In February 1959, formal authority for beginning construction was granted.[47] However, while Menzies was on holidays, some officials from the Department of Treasury convinced ministers to withhold money needed for the lake, so the start of the construction was delayed.[47] Once it started, progress was fast.[47] At its peak, the number of people physically working on the construction in the lakes was between 400 and 500.[55]John Overall, the Commissioner of the NCDC, promised Menzies that the work would be finished within four years, and he succeeded, despite the Prime Minister's scepticism. Equipment was quickly requisitioned.[57]

After the lengthy political wrangling over the design had passed, the criticism of the scheme died down. Menzies strongly denounced the "moaning" by opponents of the lake.[57] Most critics decried the project as a waste of money that should have been spent on essential services across Australia.[57] Less strident concerns centred on the potentially negative effects of the lake, such as mosquitoes, ecological degeneration,[57] siltation and the possibility that the lake would create fog.[56] The latter of these concerns has proven to be unfounded.[58]

[edit] Lakes, islands and foreshore

The excavation of Lake Burley Griffin began in 1960 with the clearing of vegetation from the floodplain of the Molonglo River. The trees on the golf course and along the river were pulled up, along with the various sports grounds and houses.[59]

During major earthworks, at least 382,000 cubic metres (500,000Â cuÂ yd) of topsoil was excavated.[60] It was collected for use at several public parks and gardens,[60] including the future Commonwealth Park on the northern shore. It was also used to create the six artificial islands including Springbank Island. The island was named after the former Springbank Farm that was situated there.[60] Land excavated to create a sailing course at Yarralumla was used for the thematically named Spinnaker Island to its north, while excavated stone was moved beside the Kings Avenue Bridge at the eastern edge of the central basin from Aspen Island.[52][60][61]

Care was taken to excavate the entire lake floor to a depth of at least 2 metres (6.6 ft) to provide sufficient clearance for boat keels. Another reason given for this was that mosquitoes would not breed nor would weeds grow at such a depth.[60] A soil conservation program was launched in the catchment and bed load traps were installed to minimise loss of earth.[56] The traps have been used as a source of sand and gravel for building sites.[62] Drainage blankets were used to prevent the loss of groundwater beneath the lake.[63]

During the following phase of work, four types of lake margin were constructed.[64] On the southern side of the Central Basin, low reinforced concrete retaining walls were used,[51][64] while on the eastern side, grouted rock wall can be seen near Commonwealth Park, as well as much of the East Basin.[51][64] Sand and gravel beaches were built to cater for lakeside recreational pursuits. These are mostly prevalent on the western half of the lake complex.[51][64] Rocky outcrops, steeply sloping stable shores with water vegetation such as bullrushes were also used. This treatment is evident in the West Lake in Yarralumla.[51][64] William Holford and Partners were responsible for the foreshore landscaping, and over 55,000 trees were planted in accordance with a detailed scheme.[4][63] Eucalypts were preferred so as to maintain the natural colour of the city landscape.[63]

[edit] Bridges

Lake Burley Griffin is crossed by Commonwealth Avenue Bridge (310 metres / 1,020 feet),[60] Kings Avenue Bridge[60] (270 metres / 890 feet[65]) and a roadway over Scrivener Dam. The two bridges were constructed before the lake was filled, and replaced wooden structures.[60]

Site testing for both the Commonwealth Avenue and Kings Avenue bridges took place during late 1959 to early 1960.[55] The construction of the Kings Avenue Bridge began in 1960, followed by Commonwealth Avenue Bridge the year after.[60] Fortunately for the builders, Canberra was in a drought and the ground remained dry during construction.[55] Both bridges use post-tensioned concrete,[63] reinforced with rustproof steel cables.[66]

Both bridges are made of concrete and steel and are dual-carriageway;[67][68] Commonwealth Avenue has three lanes in each direction while Kings Avenue has two.[68][69] Instead of traditional lamp post lighting, Kings Avenue Bridge was illuminated by a series of fluorescent tubes on the handrails, a concept known as "integral lighting".[70] The design was deemed a success, so it was introduced to the Commonwealth Avenue Bridge also. Both structures won awards from the Illumination Engineering Society.[71]

Kings Avenue Bridge opened on 10 March 1962. Prime Minister Menzies unlocked a ceremonial chain before the motorcade and pageant crossed the lake in front of a large crowd.[60] Commonwealth Avenue Bridge opened in 1963 without an official ceremony. Menzies called it "the finest building in the national capital".[60]

The dam that holds back the waters of Lake Burley Griffin was named Scrivener Dam after Charles Robert Scrivener.[47] The dam was designed and built by Rheinstahl Union Brückenbau in West Germany,[60][64] and utilised state-of-the-art post-tensioning techniques to cope with any problems or movements in the riverbed.[55] This was required because of the quartz porphyry and geological faulting upon which the dam sits.[64] About 55,000 cubic metres (72,000 cu yd) of concrete was used in its construction. The dam is 33 metres (108 ft) high and 319 metres (1,047 ft) long with a maximum wall thickness of 19.7 metres (65 ft). The dam is designed to handle a once in 5,000 year flood event.[65] Construction began in September 1960 and the dam was locked in September 1963.[64]

The dam has five bay spillway controlled by 30.5 metres (100 ft) wide,[65] hydraulically operated fish-belly flap gates.[55] The fish-belly gates allow for a precise control of water level, reducing the dead area on the banks between high and low water levels. The five gates have only been opened simultaneously once in the dam's history, during heavy flooding in 1976.[65] The gates hold two thirds of the lake's volume.[63] They were designed to allow easy flow of debris out of the lake.[64]

The dam has the capacity to allow a flow of 5,600 cubic metres per second (200,000 cu ft/s) but can withstand up to 8,600 cubic metres per second (300,000 cu ft/s) before "catastrophic damage" results;[62][64] A flow of 2,830 m³/s (100,000 cu ft/s) can be dealt with without any substantial change in the water level.[62] The highest recorded flow in the Molonglo was 3,400 cubic metres per second (120,000 cu ft/s) during an earlier flood.[62]

Lady Denman Drive, a roadway atop the dam wall, provides a third road crossing for the lake. It consists of a roadway and a bicycle path,[51] and allows residents in western Canberra to cross the lake.[64] This was possible because the dam gates are closed by pushing up from below, unlike most previous designs that wherein the gates were lifted from above.[72]

[edit] Lake filling

A prolonged drought coincided with and eased work on the lake's construction. The valves on the Scrivener Dam were closed on 20 September 1963 by Minister for the Interior, Gordon Freeth; Menzies was absent due to ill health.[72] Several months on, with no rain in sight, mosquito-infested pools of water were the only visible sign of the lake filling.[72] With the eventual breaking of the drought, the lake reached the planned level on 29 April 1964.[49] On 17 October 1964, Menzies (by now Sir Robert) commemorated the filling of the lake and the completion of stage one with an opening ceremony amid the backdrop of sailing craft.[49][73] The ceremony was accompanied by fireworks display, and Griffin's lake had finally come to fruition after five decades, at the cost of AUD5,039,050.[49][63] Freeth suggested that Menzies had "been in a material sense the father of the lake" and that the lake should be named after him.[74] Menzies insisted that the lake should be named after Griffin.[47]

In times of severe drought, Lake Burley Griffin's water level can fall unacceptably low. When this happens, a release of water from Googong Dam located upstream can be scheduled to top up and restore the lake water level.[75] The Googong Dam is located on the Queanbeyan River which is a tributary of the Molonglo River.[76] The dam whose construction was finished in 1979 is one of three dams ~the Cotter and Corin Dams are the others~ that meet the water supply needs of the Canberra and Queanbeyan region.[77] The Googong Dam's water carrying capacity is 124,500,000 cubic metres (100,900 acre·ft).[76]

[edit] Later history and development

Griffin's design made the lake a focal point of the city. In the four decades since the initial construction of the lake, various buildings of national importance were added. According to the policy plan of the government, "The lake is not only one of the centrepieces of Canberra's plan in its own right, but forms the immediate foreground of the National Parliamentary Area." [48]

The creation of the lake also gave a water frontage to many prominent institutions that were previously landlocked. The Royal Canberra Hospital was located on the Acton Peninsula between the West Lake and the West Basin on the north shore until its demolition.[78] Government House, the historic Blundell's Cottage~which was built over 50 years before construction of Canberra began~and the newly built Australian National University, on the southern and northern shores of the West Lake, both gained a waterfront.[78]

In 1970, two tourist attractions were added to the middle of Central Basin. The Captain James Cook Memorial was built by the government to commemorate the Bicentenary of (then Lieutenant) James Cook's first sighting of the east coast of Australia. It includes a water jet fountain located in the central basin (based on the Jet d'eau[79] in Geneva) and a skeleton globe sculpture at Regatta Point showing the paths of Cook's expeditions. On 25 April 1970, Queen Elizabeth II officially inaugurated the memorial.[80] As part of the same ceremony, Queen Elizabeth also opened the National Carillon on Aspen Island, a set of 53 bronze bells donated by the British Government to commemorate the city's 50th anniversary.[53]

The completion of the central basin placed a waterway between Parliament House and the War Memorial and a landscaped boulevard was built along the land axis.[81] Later, various buildings of national importance were built along the

land axis in the late-1960s through to the early 1980s. The National Library was opened on the western side of the axis in April 1968.[82] Building of the High Court and National Gallery occurred in the late-1970s and the buildings were opened in May 1980 and October 1982 respectively.[83] The latter two buildings lie on the eastern side of the axis and are connected by an aerial bridge.[52][84] In 1988, the new Parliament House was built on Capital Hill, thereby completing the most important structure in the Parliamentary Triangle.[52]

The current home of the National Museum was built on the former site of the Royal Canberra Hospital in 2001.[14][52] This occurred after the public were encouraged to watch the controlled demolition of the hospital in 1997, but a girl was killed by flying debris, leading to criticism of the ACT Government.[85]

At the start of the 21st century, the layout of the lake was significantly altered for the first time since its construction, through the Kingston Foreshores Redevelopment on southern shore of the East Basin, which was planned in 1997.[86] A bidding process was enacted,[87] multi-million dollar luxury apartment complexes were built in the suburb of Kingston,[88] driving property values to record-breaking levels.[86] After a dispute over the environmental impact of the development, building works commenced on the previously industrial lakeside area of the suburb.[89][90] In 2007, work started to reclaim land from the lakebed to form a harbour, which is expected to turn the area into an entertainment hub.[86]

The Kingston Powerhouse, which used to provide the city's power supply, was converted into the Canberra Glassworks in 2007, 50 years after the electricity generators stopped.[91] A 22-metre (72 ft) high tower of glass and light named Touching Lightly, will be built at Kingston after being approved by the government in April 2009. An environmentally friendly structure, it is expected to be completed in mid-2009.[92]

In 2007, the government unveiled a proposal to redevelop the area surrounding the historic Albert Hall into a tourist and dining precinct. This included the building of an eight-storey building and the rezoning of some waterfront land currently designated as cultural to commercial.[93] It was met with widespread hostility from heritage activists and the general community, which submitted more than 3,300 signatories in a petition against the scheme.[94][95] One of the criticisms was that the project was tilted too heavily towards business, and neglected the arts and community events.[96] The proposal was scrapped in 2009.[97][98][99]

It has been proposed that a footbridge, to be named Immigration Bridge, be built between the National Museum of Australia and Lennox Gardens on the south shore, in recognition of the contributions that immigrants have made to Australia.[100] The proposal has mostly received negative feedback.[101] An inquiry recommended that the bridge be redesigned or moved to accommodate the needs of other lake users.[102]

[edit] Lakeside recreation

The surrounds of Lake Burley Griffin are very popular recreational areas. Public parks exist along most of the shore line, with free electric barbecue facilities, fenced-in swimming areas, picnic tables and toilets.[52] These parklands form a large part of the area around the lake, and occupy 3.139 km² (776 acres) in total.[50] Some of the parks reserved for public recreation include Commonwealth, Weston, Kings and Grevillea Parks, Lennox Gardens and Commonwealth Place.[52] Commonwealth and Kings Park on the northern shore of the Central Basin are among the two most popular. The former is an urban horticultural park and is the location of the Canberra Festival.[14] Commonwealth Park is the location of Floriade, an annual flower festival that is held for around a month in spring and attracts upwards of 300,000 visitors,[103] a number comparable to the city population. The largest flower festival in Australia,[104] the event is a major tourist attraction for the city, and legal action was threatened after another festival in Australia wanted to use the same name.[105] An expansion is being planned to coincide

with the centenary of the national capital.[106] The Weston Park to the west is known for its woodland and conifers, while Black Mountain Peninsula is known as a picnicking site with eucalypts.[14] Grevillea and Bowen Parks on the East Basin tend to be little used.[78]

Owing to the proliferation of beaches, boat ramps and jetties, the West Lake is the area most used by swimmers and vessels.[14] A bike path also surrounds the lake, and riding, walking or jogging around the lake are a popular activity on the weekends.[2][78][107] Fireworks are often held over the lake on New Year's Eve, and a large show called Skyfire has been held at the lake since 1988.[108][109]

[edit] Water sports

Lake Burley Griffin, apart from being ornamental, is used for many recreational activities. Canoeing, sailing, paddleboating and windsurfing are popular.[78] A rowing course is set up at the western end of the lake.[110] The National Championships were held in the lake in 1964,[61] but high winds have deterred organisers. On one occasion, winds swept a boat into a bridge pylon.[111] While not particularly popular, opportunities for swimming have been limited recently because of increasingly frequent lake closures due to concerns about water quality;[112] another deterrent against swimming is the generally cold water temperature.[110][113] During summer, the lake is used for the swim leg of numerous triathlon and aquathlon events including the Sri Chinmoy Triathlon Festival.[114]

Generally, powerboat use on the lake is not permitted. Permits are available for the use of powered boats on the lake for use in rescue, training, commercial purposes or special interest (such as historic steam powered boats).[115] Molonglo Reach, an area of the Molonglo River just before it enters the east basin is set aside for water skiing. Ten powerboats may be used in this limited area.[116]

[edit] Safety

The lake is patrolled by the Australian Federal Police water police.[49] The water police give assistance to lake users, helping to right boats and towing crippled craft to shore.[49]

At most swimming locations around Lake Burley Griffin there are fenced-in swimming areas for safety. In the more popular areas, there are also safety lockers with life belts and emergency phones for requesting help. Between 1962 and 1991, seven people died from drowning.[117]

For safety and water quality reasons, the lake has different zones for different activities.[118] The eastern extremity is zoned for primary contact water activities such as swimming and water skiing.[118] The East and Central Basins, closer to populated areas, are zoned for secondary contact water sports such as sailing or rowing.[118] West Lake and Tarcoola Reach, which covers the area between Commonwealth Avenue and Kurrajong Point, is the primary recreational area of the lake, and both primary and secondary contact water sports are permitted.[118] Yarramundi Reach near Scrivener Dam has a marked rowing course, and is zoned as secondary, although primary contact activities are also allowed.[118]

[edit] Environmental issues

[edit] Water quality

Toxic blue-green algae blooms are a reasonably common occurrence in the lake.[119] Warnings about coming into contact with the water are released when an algal bloom is detected. Attempts are being made to limit the amount of phosphates entering the lake in the hope of improving its water quality.[120] Blue-green algae (more correctly cyanobacteria) produce toxins, which can be harmful for humans and any other animals that come in contact with the contaminated water. There have been several cases of dogs being affected after playing in and drinking the lake water.[121]

The water also appears murky due to a high level of turbidity;[113] however, this is not usually a health risk.[113] However, the turbidity, which is caused by wind, prevents photosynthetic stabilisation.[122] Siltation is not considered a major problem and is only a factor in the East Basin, but dredging

is not required. The problem has eased with the construction of the Googong Dam, and the spectre of heavy metal pollution has receded,[119] partly due to the closure of some lead mines upstream.[58] However, leaching and groundwater leakage still causes some pollution.[58] Rubbish, oil and sediment traps have been set up at the incoming openings to the lake to minimise pollution.[119]

[edit] Aquatic life and fishing

Fishing is quite popular in the lake. The most common species caught is the illegally introduced carp.[119] Annual monitoring is carried out to determine fish populations. However, a number of less common species also inhabit the lake, including native Murray cod, western carp gudgeon and silver perch, as well as introduced goldfish, *Gambusia*, rainbow trout and brown trout. [123]

The lake has been stocked annually with a variety of introduced and native species and over half a million fish have been released since 1981.[124] There have been many changes to the fish populations in the lake as well as stocking practices since it was first filled.[124]

Regular stocking since the start of the 1980s have re-established reasonable populations of golden perch and Murray cod;[124] native fish that were indigenous to the Molonglo River before the lake was built, but had been lost to mining pollution of the Molonglo River in the first half of the 20th century.[125] The main reason for stocking is to boost fish stocks along the Molonglo, which have been depleted by overfishing, introduced species and habitat destruction. One of the motives for raising the level of Murray cod and golden perch is to balance the ecosystem by having them act as native predators of other fish.[125]

Silver perch and brown trout were released in 1981⁸³ and 1987⁸⁹ respectively, but have not been stocked since.[124] Rainbow trout have been released sporadically, approximately once a decade, but have not been released since 2002⁰⁴,[124] due to unacceptably low survival rates. According to a government report, the reason for the low survival rate is unknown, but the dominance of carp in the competition for food is one prominent theory.[124] Golden perch and Murray cod have accounted for around four fifths of the released fish in the last three decades and have been the only fish stocked in the last five years.[124] The government plans to stock only these two species for the five years leading up to 2014.[126]

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[^] a b c "Lake Burley Griffin and Surrounding Parklands". National Capital Authority.

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[^] a b c d Lake Burley Griffin, Canberra^Â : Policy Plan, p. 3.

[^] a b c d e f g h Andrews, p. 88.

[^] Sparke, pp. 4^Â 7.

[^] "Canberra contour survey". National Library of Australia. 1909.

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[^] The Griffin Legacy. Canberra: National Capital Authority. 2004. p.^Â 51. ISBN 0-9579550-2-2.

[^] a b Lake Burley Griffin, Canberra^Â : Policy Plan, p. 4.

[^] Wigmore, p. 67.

[^] Lake Burley Griffin, Canberra^Â : Policy Plan, pp. 6^Â 7.

[^] a b c Andrews, p. 89.

[^] a b c Wigmore, p. 64.

[^] a b c d e Sparke, pp. 1^Â 3.

[^] a b c d e f Lake Burley Griffin, Canberra^Â : Policy Plan, p. 17.

[^] "Short history". Canberra House.

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- ^ a b Wigmore, pp. 52â ^57.
- ^ Andrews, pp. 88â ^89.
- ^ Wigmore, pp. 61â ^63.
- ^ Wigmore, p. 63.
- ^ a b Wigmore, pp. 69â ^79.
- ^ Sparke, p. 2.
- ^ a b Sparke, p. 6.
- ^ Sparke, pp. 7â ^9.
- ^ Minty, p. 804.
- ^ Sparke, p. 14.
- ^ Sparke, pp. 6â ^7.
- ^ Sparke, p. 5.
- ^ a b Sparke, p. 131.
- ^ a b Wigmore, p. 151.
- ^ a b c Wigmore, p. 152.
- ^ a b c Sparke, p. 13.
- ^ Sparke, p. 11.
- ^ Sparke, pp. 13â ^14.
- ^ a b Andrews, p. 90.
- ^ Sparke, pp. 13â ^15.
- ^ Sparke, p. 16.
- ^ Sparke, pp. 16â ^17.
- ^ Sparke, pp. 15â ^16.
- ^ a b Sparke, p. 17.
- ^ Sparke, p. 30.
- ^ Sparke, pp. 31â ^32.
- ^ Wigmore, p. 153.
- ^ Sparke, pp. 19â ^21.
- ^ Sparke, pp. 56â ^57.
- ^ Sparke, pp. 60â ^61.
- ^ a b c d e f Sparke, p. 132.
- ^ a b Lake Burley Griffin, CanberraÂ : Policy Plan, p. 1.
- ^ a b c d e f Sparke, p. 141.
- ^ a b c Lake Burley Griffin, CanberraÂ : Policy Plan, p. 8.
- ^ a b c d e f g Lake Burley Griffin, CanberraÂ : Policy Plan, p. 9.
- ^ a b c d e f g "Lake Burley Griffin Interactive Map". National Capital Authority. <http://www.nationalcapital.gov.au/enjoythelake/map.asp>. Retrieved 2009-06-01.
- ^ a b Sparke, p. 174.
- ^ Andrews, p. 91.
- ^ a b c d e f Sparke, p. 136.
- ^ a b c Andrews, p. 92.
- ^ a b c d Sparke, p. 135.
- ^ a b c Minty, p. 808.
- ^ Sparke, pp. 136â ^138.
- ^ a b c d e f g h i j k l Sparke, p. 138.
- ^ a b Andrews, p. 94.
- ^ a b c d Minty, p. 806.
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- ^ a b Wigmore, p. 189.
- ^ Andrews, pp. 30â ^31.
- ^ Andrews, p. 141.
- ^ Andrews, pp. 141â ^142.

^ a b c Sparke, p. 140.

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^ Sparke, pp. 97, 132.

^ Sparke, pp. 220â ^221.

^ a b ACT Infrastructure Five-yearly report to the Council of Australian Governments (COAG), p. 42.

^ ACT Infrastructure Five-yearly report to the Council of Australian Governments (COAG), p. 40â ^41.

^ a b c d e Lake Burley Griffin, CanberraÂ : Policy Plan, p. 18.

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