

Satyajit Ray (সত্যজিৎ রায়; 2 May 1921 – 23 April 1992) was an Indian filmmaker. He is regarded as one of the few great masters of world cinema. Ray was born in the city of Calcutta into a Bengali family prominent in the world of arts and literature. Starting his career as a commercial artist, Ray was drawn into independent filmmaking after meeting French filmmaker Jean Renoir and viewing Vittorio De Sica's Italian neorealist 1948 film *Bicycle Thieves* during a visit to London.

Ray directed 36 films, including feature films, documentaries and shorts. He was also a fiction writer, publisher, illustrator, calligrapher, graphic designer and film critic. He authored several short stories and novels, primarily aimed at children and adolescent. Feluda, the sleuth, and Professor Shonku, the scientist in his science fictions, are popular fictional characters created by him.

Ray's first film, *Pathar Panchali* (1955), won eleven international prizes, including Best Human Documentary at the Cannes Film Festival. This film, *Aparajito* (1956) and *Apur Sansar* (1959) form *The Apu Trilogy*. Ray did the scripting, casting, scoring, and editing, and designed his own credit titles and publicity material. Ray received many major awards in his career, including 32 Indian National Film Awards, a number of awards at international film festivals and award ceremonies, and an Academy Award in 1992. The Government of India honoured him with the Bharat Ratna in 1992.

[edit] Early life and background

Satyajit Ray's ancestry can be traced back for at least ten generations.[9] Ray's grandfather, Upendrakishore Ray was a writer, illustrator, philosopher, publisher, amateur astronomer and a leader of the Brahmo Samaj, a religious and social movement in nineteenth century Bengal. He also set up a printing press by the name of U. Ray and Sons, which formed a crucial backdrop to Satyajit's life. Sukumar Ray, Upendrakishore's son and father of Satyajit, was a pioneering Bengali writer of nonsense rhyme and children's literature, an illustrator and a critic. Ray was born to Sukumar and Suprabha Ray in Calcutta.

Sukumar Ray died when Satyajit was barely three, and the family survived on Suprabha Ray's meager income. Ray studied at Ballygunge Government High School, Calcutta, and completed his B.A. (Hons.) in economics at Presidency College of the University of Calcutta, though his interest was always in fine arts. In 1940, his mother insisted that he study at the Visva-Bharati University at Santiniketan, founded by Rabindranath Tagore. Ray was reluctant due to his love of Calcutta, and the low opinion of the intellectual life at Santiniketan[10] His mother's persuasion and his respect for Tagore finally convinced him to try. In Santiniketan, Ray came to appreciate Oriental art. He later admitted that he learned much from the famous painters Nandalal Bose[11] and Benode Behari Mukherjee. Later he produced a documentary film, *The Inner Eye*, about Mukherjee. His visits to Ajanta, Ellora and Elephanta stimulated his admiration for Indian art.[12]

In 1943, Ray started work at D.J. Keymer, a British-run advertising agency, as a "junior visualiser," earning eighty rupees a month. Although he liked visual design (graphic design) and he was mostly treated well, there was tension between the British and Indian employees of the firm. The British were better paid, and Ray felt that "the clients were generally stupid." [13] Later, Ray also worked for Signet Press, a new publishing house started by D. K. Gupta. Gupta asked Ray to create cover designs for books to be published by Signet Press and gave him complete artistic freedom. Ray designed covers for many books, including Jibanananda Das's Banalata Sen, and Rupasi Bangla, Jim Corbett's Maneaters of Kumaon, and Jawaharlal Nehru's Discovery of India. He worked on a children's version of Pather Panchali, a classic Bengali novel by Bibhutibhushan Bandopadhyay, renamed as Aam Antir Bhepu (The mango-seed whistle). Designing the cover and illustrating the book, Ray was deeply influenced by the work. He used it as the subject of his first film, and featured his illustrations as shots in his groundbreaking film. [14]

Along with Chidananda Dasgupta and others, Ray founded the Calcutta Film

Society in 1947. They screened many foreign films, many of which Ray watched and seriously studied. He befriended the American GIs stationed in Calcutta during World War II, who kept him informed about the latest American films showing in the city. He came to know a RAF employee, Norman Clare, who shared Ray's passion for films, chess and western classical music.[15]

In 1949, Ray married Bijoya Das, his first cousin and longtime sweetheart.[16] The couple had a son, Sandip, who is now a film director. In the same year, French director Jean Renoir came to Calcutta to shoot his film *The River*. Ray helped him to find locations in the countryside. Ray told Renoir about his idea of filming *Pather Panchali*, which had long been on his mind, and Renoir encouraged him in the project.[17] In 1950, D.J. Keymer sent Ray to London to work at its headquarters office. During his three months in London, Ray watched 99 films. Among these was the neorealist film *Ladri di biciclette* (*Bicycle Thief*) (1948) by Vittorio De Sica, which had a profound impact on him. Ray later said that he came out of the theater determined to become a film-maker.[18]

[edit] The Apu Years (1950â ^59)

Ray decided to use *Pather Panchali* (1928), the classic bildungsroman of Bengali literature, as the basis for his first film. The semi-autobiographical novel describes the maturation of Apu, a small boy in a Bengal village.

Ray gathered an inexperienced crew, although both his cameraman Subrata Mitra and art director Bansi Chandragupta went on to achieve great acclaim. The cast consisted of mostly amateur actors. He started shooting in late 1952 with his personal savings and hoped to raise more money once he had some passages shot, but did not succeed on his terms.[19] As a result, Ray shot *Pather Panchali* over three years, an unusually long period, based on when he or his production manager Anil Chowdhury could raise additional funds.[19] He refused funding from sources who wanted a change in script or supervision over production. He also ignored advice from the government to incorporate a happy ending, but he did receive funding that allowed him to complete the film.[20] Ray showed an early film passage to Anglo-Irish director John Huston, who was in India scouting locations for *The Man Who Would Be King*. The passage was of the vision which Apu and his sister have of the train running through the countryside, the only sequence which Ray had yet filmed due to his small budget. Huston notified Monroe Wheeler at the New York Museum of Modern Art (MOMA) that a major talent was on the horizon.

With a loan from the West Bengal government, Ray finally completed the film. It was released in 1955 to great critical and popular success. It earned numerous prizes and had long runs in both India and abroad. In India, the reaction to the film was enthusiastic; *The Times of India* wrote that "It is absurd to compare it with any other Indian cinema [...] *Pather Panchali* is pure cinema." [21] In the United Kingdom, Lindsay Anderson wrote a glowing review of the film.[21] But, the reaction was not uniformly positive. After watching the movie, François Truffaut is reported to have said, "I don't want to see a movie of peasants eating with their hands." [22] Bosley Crowther, then the most influential critic of *The New York Times*, wrote a scathing review of the film. Its American distributor Ed Harrison was worried Crowther's review would dissuade audiences, but the film had an exceptionally long run when released in the United States.

Ray's international career started in earnest after the success of his next film, *Aparajito* (*The Unvanquished*). [23] This film shows the eternal struggle between the ambitions of a young man, Apu, and the mother who loves him. [23] Critics such as Mrinal Sen and Ritwik Ghatak rank it higher than Ray's first film. [23] *Aparajito* won the Golden Lion at the Venice Film Festival, bringing Ray considerable acclaim. Before completing *The Apu Trilogy*, Ray directed and released two other films: the comic *Parash Pathar* (*The Philosopher's Stone*), and *Jalsaghar* (*The Music Room*), a film about the decadence of the Zamindars, considered one of his most important works. [24]

While making *Aparajito*, Ray had not planned a trilogy, but after he was asked about the idea in Venice, it appealed to him. [25] He finished the last of the

trilogy, *Apur Sansar* (The World of Apu) in 1959. Critics Robin Wood and Aparna Sen found this to be the supreme achievement of the trilogy. Ray introduced two of his favourite actors, Soumitra Chatterjee and Sharmila Tagore, in this film. It opens with Apu living in a Calcutta house in near-poverty. He becomes involved in an unusual marriage with Aparna. The scenes of their life together form "one of the cinema's classic affirmative depictions of married life." [26] They suffer tragedy. After *Apur Sansar* was harshly criticised by a Bengali critic, Ray wrote an article defending it. He rarely responded to critics during his filmmaking career, but also later defended his film *Charulata*, his personal favourite. [27]

Ray's film successes had little influence on his personal life in the years to come. He continued to live with his wife and children in a rented house, with his mother, uncle and other members of his extended family. [28]

[edit] From *Devi* to *Charulata* (1959â ^64)

During this period, Ray composed films on the British Raj period (such as *Devi*), a documentary on Tagore, a comic film (*Mahapurush*) and his first film from an original screenplay (*Kanchenjunga*). He also made a series of films that, taken together, are considered by critics among the most deeply felt portrayals of Indian women on screen. [29]

Ray followed *Apur Sansar* with *Devi* (The Goddess), a film in which he examined the superstitions in the Hindu society. Sharmila Tagore starred as Doyamoyee, a young wife who is deified by her father-in-law. Ray was worried that the censor board might block his film, or at least make him re-cut it, but *Devi* was spared. In 1961, on the insistence of Prime minister Jawaharlal Nehru, Ray was commissioned to make a documentary on Rabindranath Tagore, on the occasion of the poet's birth centennial, a tribute to the person who likely most influenced Ray. Due to limited footage of Tagore, Ray faced the challenge of making a film out of mainly static material. He said that it took as much work as three feature films. [30]

In the same year, together with Subhas Mukhopadhyay and others, Ray was able to revive *Sandesh*, the children's magazine which his grandfather once published. Ray had been saving money for some years to make this possible. [31] A duality in the name (*Sandesh* means both "news" in Bengali and also a sweet popular dessert) set the tone of the magazine (both educational and entertaining). Ray began to make illustrations for it, as well as to write stories and essays for children. Writing became his major source of income in the years to come.

In 1962, Ray directed *Kanchenjunga*. Based on his first original screenplay, it was his first film in colour. The film tells of an upper-class family spending an afternoon in Darjeeling, a picturesque hill town in West Bengal. They try to arrange the engagement of their youngest daughter to a highly paid engineer educated in London. He had first conceived shooting the film in a large mansion, but later decided to film it in the famous hill town. He used the many shades of light and mist to reflect the tension in the drama. Ray noted that while his script allowed shooting to be possible under any lighting conditions, a commercial film contingent present at the same time in Darjeeling failed to shoot a single scene, as they only wanted to do so in sunshine. [32]

In the sixties, Ray visited Japan and took particular pleasure in meeting the filmmaker Akira Kurosawa, for whom he had very high regard. While at home, he would take an occasional break from the hectic city life by going to places such as Darjeeling or Puri to complete a script in isolation.

In 1964 Ray made *Charulata* (The Lonely Wife); it was the culmination of this period of work, and regarded by many critics as his most accomplished film. [33] Based on "Nastanirh", a short story of Tagore, the film tells of a lonely wife, Charu, in 19th-century Bengal, and her growing feelings for her brother-in-law Amal. Critics have referred to this as Ray's Mozartian masterpiece. He said the film contained the least flaws among his work, and it was his only work which, given a chance, he would make exactly the same way. [34] Madhabi Mukherjee's performance as Charu, and the work of both Subrata Mitra and Bansi Chandragupta in the film, have been highly praised. Other films in this period include

Mahanagar (The Big City), Teen Kanya (Three Daughters), Abhijan (The Expedition) and Kapurush o Mahapurush (The Coward and the Holy Man).

[edit] New directions (1965â ^82)

In the post-Charulata period, Ray took on projects of increasing variety, ranging from fantasy to science fiction to detective films to historical drama. Ray also made considerable formal experimentation during this period. He expressed contemporary issues of Indian life, responding to a perceived lack of these issues in his films. The first major film in this period is Nayak (The Hero), the story of a screen hero traveling in a train and meeting a young, sympathetic female journalist. Starring Uttam Kumar and Sharmila Tagore, in the twenty-four hours of the journey, the film explores the inner conflict of the apparently highly successful matinee idol. In spite of the film's receiving a "Critics prize" at the Berlin Festival, it had a generally muted reception.[35]

In 1967, Ray wrote a script for a film to be called The Alien, based on his short story "Bankubabur Bandhu" ("Banku Babu's Friend") which he wrote in 1962 for Sandesh, the Ray family magazine. Columbia Pictures was the producer for what was a planned U.S.-India co-production, and Peter Sellers and Marlon Brando were cast as the leading actors. Ray found that his script had been copyrighted and the fee appropriated by Mike Wilson. Wilson had initially approached Ray through their mutual friend, Arthur C. Clarke, to represent him in Hollywood. Wilson copyrighted the script credited to Mike Wilson & Satyajit Ray, although he contributed only one word. Ray later said that he never received a penny for the script.[36] After Brando dropped out of the project, the project tried to replace him with James Coburn, but Ray became disillusioned and returned to Calcutta.[36][37] Columbia expressed interest in reviving the project several times in the 1970s and 1980s, but nothing came of it. When E.T. was released in 1982, Clarke and Ray saw similarities in the film to his earlier Alien script. In a 1980 Sight & Sound feature, Ray had discussed the collapse of his American co-project. His biographer Andrew Robinson provided more details in The Inner Eye (1989). Ray believed that Spielberg's film would not have been possible without copies of his script of The Alien having been available in the United States. Spielberg has denied this charge.[38] Besides The Alien, two other unrealized projects which Ray had intended to direct were adaptations of the ancient Indian epic, the Mahabharata, and E. M. Forster's 1924 novel A Passage to India.[39]

In 1969, Ray released what would be commercially the most successful of his films. Based on a children's story written by his grandfather, Goopy Gyne Bagha Byne (The Adventures of Goopy and Bagha), it is a musical fantasy. Goopy the singer and Bagha the drummer, equipped by three gifts allowed by the King of Ghosts, set out on a fantastic journey. They try to stop an impending war between two neighbouring kingdoms. Among his most expensive enterprises, the film project was difficult to finance. Ray abandoned his desire to shoot it in colour, as he turned down an offer that would have forced him to cast a certain Bollywood actor as the lead.[40]

Ray made a film from a novel by the young poet and writer, Sunil Gangopadhyay. Featuring a musical motif structure acclaimed as more complex than Charulata,[41] Aranyer Din Ratri (Days and Nights in the Forest) traces four urban young men going to the forests for a vacation. They try to leave their daily lives behind. All but one of them become involved in encounters with women, which becomes a deep study of the Indian middle class. According to Robin Wood, "a single sequence [of the film] ... would offer material for a short essay".[41]

After Aranyer, Ray addressed contemporary Bengali life. He completed what became known as the Calcutta Trilogy: Pratidwandi (1970), Seemabaddha (1971), and Jana Aranya (1975), three films that were conceived separately but had thematic connections.[42] Pratidwandi (The Adversary) is about an idealist young graduate; if disillusioned at the end of film, he is still uncorrupted. Jana Aranya (The Middleman) showed a young man giving in to the culture of corruption to make a living. Seemabaddha (Company Limited) portrayed an already successful man giving up his morality for further gains. In the first film,

Pratidwandi, Ray introduces a new, elliptical narrative style, such as scenes in negative, dream sequences, and abrupt flashbacks.[42] In the 1970s, Ray adapted two of his popular stories as detective films. Though mainly addressed to children and young adults, both *Sonar Kella* (The Golden Fortress) and *Joy Baba Felunath* (The Elephant God) found some critical following.[43]

Ray considered making a film on the Bangladesh Liberation War but later abandoned the idea. He said that, as a filmmaker, he was more interested in the travails of the refugees and not the politics.[44] In 1977, Ray completed *Shatranj Ke Khiladi* (The Chess Players), a Hindi film based on a story by Munshi Premchand. It was set in Lucknow in the state of Oudh, a year before the Indian rebellion of 1857. A commentary on issues related to the colonization of India by the British, this was Ray's first feature film in a language other than Bengali. It is his most expensive and star-studded film, featuring Sanjeev Kumar, Saeed Jaffrey, Amjad Khan, Shabana Azmi, Victor Bannerjee and Richard Attenborough.

In 1980, Ray made a sequel to *Goopy Gyne Bagha Byne*, a somewhat political *Hirak Rajar Deshe* (Kingdom of Diamonds). The kingdom of the evil Diamond King, or *Hirok Raj*, is an allusion to India during Indira Gandhi's emergency period.[45] Along with his acclaimed short film *Pikoo* (Pikoo's Diary) and hour-long Hindi film, *Sadgati*, this was the culmination of his work in this period.

[edit] Sikkim

The DVD of the documentary on Sikkim directed by Satyajit Ray and produced by the Royal family of the then sovereign Sikkim in 1971 and banned by the Indian Government till 2010, was finally launched by Angel Digital in Kolkata in 2010. The documentary portrays only the flora and fauna of the land. It only shows the beautiful landscape with no controversial footage. [46]

[edit] The last phase (1983â ^92)

In 1983, while working on *Ghare Baire* (Home and the World), Ray suffered a heart attack; it would severely limit his productivity in the remaining 9 years of his life. *Ghare Baire* was completed in 1984 with the help of Ray's son (who operated the camera from then on) because of his health condition. He had wanted to film this Tagore novel on the dangers of fervent nationalism for a long time, and wrote a first draft of a script for it in the 1940s.[47] In spite of rough patches due to Ray's illness, the film did receive some critical acclaim. It had the first kiss fully portrayed in Ray's films. In 1987, he made a documentary on his father, Sukumar Ray.

Ray's last three films, made after his recovery and with medical strictures in place, were shot mostly indoors, and have a distinctive style. They have more dialogue than his earlier films and are often regarded as inferior to his earlier body of work.[48] The first, *Ganashatru* (An Enemy of the People) is an adaptation of the famous Ibsen play, and considered the weakest of the three.[49] Ray recovered some of his form in his 1990 film *Shakha Proshakha* (Branches of the Tree).[50] In it, an old man, who has lived a life of honesty, comes to learn of the corruption of three of his sons. The final scene shows the father finding solace only in the companionship of his fourth son, who is uncorrupted but mentally ill. Ray's last film, *Agantuk* (The Stranger), is lighter in mood but not in theme. When a long-lost uncle arrives to visit his niece in Calcutta, he arouses suspicion as to his motive. This provokes far-ranging questions in the film about civilization.[51]

In 1992, Ray's health deteriorated due to heart complications. He was admitted to a hospital, and would never recover. An honorary Oscar was awarded to him weeks before his death, which he received in a gravely ill condition. He died on 23 April 1992 at the age of 70.

[edit] Film craft

Satyajit Ray considered script-writing to be an integral part of direction. Initially he refused to make a film in any language other than Bengali. In his two non-Bengali feature films, he wrote the script in English; translators interpreted it in Hindi or Urdu under Ray's supervision. Ray's eye for detail was matched by that of his art director Bansi Chandragupta. His influence on

the early films was so important that Ray would always write scripts in English before creating a Bengali version, so that the non-Bengali Chandragupta would be able to read it. The craft of Subrata Mitra garnered praise for the cinematography of Ray's films. A number of critics thought that his departure from Ray's crew lowered the quality of cinematography in the following films.[35] Though Ray openly praised Mitra, his single-mindedness in taking over operation of the camera after *Charulata* caused Mitra to stop working for him after 1966. Mitra developed "bounce lighting", a technique to reflect light from cloth to create a diffused, realistic light even on a set. Ray acknowledged his debts to Jean-Luc Godard and François Truffaut of the French New Wave for introducing new technical and cinematic innovations.[52]

Ray's regular editor was Dulal Datta, but the director usually dictated the editing while Datta did the actual work. Because of financial reasons and Ray's meticulous planning, his films were mostly cut "on the camera" (apart from *Pather Panchali*). At the beginning of his career, Ray worked with Indian classical musicians, including Ravi Shankar, Vilayat Khan and Ali Akbar Khan. He found that their first loyalty was to musical traditions, and not to his film. He had a greater understanding of western classical forms, which he wanted to use for his films set in an urban milieu.[53] Starting with *Teen Kanya*, Ray began to compose his own scores.

He used actors of diverse backgrounds, from famous film stars to people who had never seen a film (as in *Aparajito*).[54] Robin Wood and others have lauded him as the best director of children, pointing out memorable performances in the roles of Apu and Durga (*Pather Panchali*), Ratan (*Postmaster*) and Mukul (*Sonar Kella*). Depending on the talent or experience of the actor, Ray varied the intensity of his direction, from virtually nothing with actors such as Utpal Dutt, to using the actor as "a puppet"[55] (Subir Banerjee as young Apu or Sharmila Tagore as Aparna). Actors who had worked for Ray praised his customary trust but said he could also treat incompetence with "total contempt".[56]

[edit] Literary works

Ray created two popular fictional characters in Bengali children's literature—*Feluda*, a sleuth, and Professor Shonku, a scientist. The *Feluda* stories are narrated by Topsy, his cousin, something of a Watson to *Feluda's* Holmes. The science fictions of Shonku are presented as a diary discovered after the scientist had mysteriously disappeared. Ray also wrote a collection of nonsense verse named *Today Bandha Ghorar Dim*, which includes a translation of Lewis Carroll's "*Jabberwocky*". He wrote a collection of humorous stories of Mullah Nasiruddin in Bengali.

His short stories were published as collections of 12 stories, in which the overall title played with the word twelve (for example *Aker pitthe dui*, or literally "Two on top of one"). Ray's interest in puzzles and puns is reflected in his stories. Ray's short stories give full rein to his interest in the macabre, in suspense and other aspects that he avoided in film, making for an interesting psychological study.[57] Most of his writings have been translated into English. Most of his screenplays have been published in Bengali in the literary journal *Eksan*. Ray wrote an autobiography about his childhood years, *Jakhan Choto Chilam* (1982).

He also wrote essays on film, published as the collections: *Our Films, Their Films* (1976), *Bishoy Chalachchitra* (1976), and *Ekei Bole Shooting* (1979). During the mid-1990s, Ray's film essays and an anthology of short stories were also published in English in the West. *Our Films, Their Films* is an anthology of film criticism by Ray. The book contains articles and personal journal excerpts. The book is presented in two sections: Ray first discusses Indian film, before turning his attention toward Hollywood, specific filmmakers (Charlie Chaplin and Akira Kurosawa), and movements such as Italian neorealism. His book *Bishoy Chalachchitra* was published in translation in 2006 as *Speaking of Films*. It contains a compact description of his philosophy of different aspects of the cinema.

[edit] Ray as Calligrapher

Satyajit Ray designed four typefaces for roman script named Ray Roman, Ray Bizarre, Daphnis, and Holiday Script, apart from numerous Bengali ones for the Sandesh magazine.[58][59] Ray Roman and Ray Bizarre won an international competition in 1971.[60] In certain circles of Calcutta, Ray continued to be known as an eminent graphic designer, well into his film career. Ray illustrated all his books and designed covers for them, as well as creating all publicity material for his films, i.e., Ray's artistic playing with the Bangla graphemes was also revealed in the cine posters and cine promo-brochures's covers. He also designed covers of several books by other authors.[61] In his calligraphic technique there are deep impacts of: (a) Artistic pattern of European musical staff notation in the graphemic syntagms; (b) alpana (a ritual painting" mainly practiced by Bengali women at the time of religious festival; the term denotes 'to coat with". Generally categorized as a Folk"-Art cf. in Ray's graphemic representations.

Thus, so-called division between classical and folk art is blurred in Ray's representation of Bangla graphemes. The three-tier X-height of Bangla graphemes was presented in a manner of musical map and the contours, curves in between horizontal and vertical meeting-point, follow the patterns of alpana. It is also noticed that the metamorphosis of graphemes (This might be designated as a Archewriting") as a living object/subject in Ray's positive manipulation of Bangla graphemes.[62]

[edit] Critical and popular response

Ray's work has been described as full of humanism and universality, and of a deceptive simplicity with deep underlying complexity.[63][64] The Japanese director Akira Kurosawa said, "Not to have seen the cinema of Ray means existing in the world without seeing the sun or the moon." [65] But his detractors find his films glacially slow, moving like a "majestic snail." [33] Some find his humanism simple-minded, and his work anti-modern; they criticize him for lacking the new modes of expression or experimentation found in works of Ray's contemporaries, such as Jean-Luc Godard.[66] As Stanley Kauffman wrote, some critics believe that Ray "assumes [viewers] can be interested in a film that simply dwells in its characters, rather than one that imposes dramatic patterns on their lives." [67] Ray said he could do nothing about the slow pace. Kurosawa defended him by saying that Ray's films were not slow, "His work can be described as flowing composedly, like a big river". [68]

Critics have often compared Ray to artists in the cinema and other media, such as Anton Chekhov, Renoir, De Sica, Howard Hawks or Mozart. The writer V. S. Naipaul compared a scene in Shatranj Ki Khiladi (The Chess Players) to a Shakespearean play; he wrote, "only three hundred words are spoken but goodness!-A terrific things happen." [26][69][70] Even critics who did not like the aesthetics of Ray's films generally acknowledged his ability to encompass a whole culture with all its nuances. Ray's obituary in The Independent included the question, "Who else can compete?" [71]

Political ideologues took issue with Ray's work. In a public debate during the 1960s, Ray and the Marxist filmmaker Mrinal Sen engaged in an argument. Sen criticized him for casting a matinee idol such as Uttam Kumar, whom he considered a compromise.[72] Ray said that Sen only attacked "easy targets", i.e. the Bengali middle-classes. Advocates of socialism said that Ray was not "committed" to the cause of the nation's downtrodden classes; some critics accused him of glorifying poverty in Pather Panchali and Ashani Sanket (Distant Thunder) through lyricism and aesthetics. They said he provided no solution to conflicts in the stories, and was unable to overcome his bourgeoisie background. During the naxalite movements in the 1970s, agitators once came close to causing physical harm to his son, Sandip.[73] Early in 1980, Ray was criticized by an Indian M.P. and former actress Nargis Dutt, who accused Ray of "exporting poverty." She wanted him to make films to represent "Modern India." [74]

[edit] Legacy

Satyajit Ray is a cultural icon in India and in Bengali communities worldwide.[75] Following his death, the city of Calcutta came to a virtual

standstill, as hundreds of thousands of people gathered around his house to pay their last respects.[76] Satyajit Ray's influence has been widespread and deep in Bengali cinema; a number of Bengali directors, including Aparna Sen, Rituparno Ghosh and Gautam Ghose in India, Tareq Masud and Tanvir Mokammel in Bangladesh, and Aneel Ahmad in England, have been influenced by his film craft. Across the spectrum, filmmakers such as Buddhadeb Dasgupta, Mrinal Sen[77] and Adoor Gopalakrishnan have acknowledged his seminal contribution to Indian cinema. Beyond India, filmmakers such as Martin Scorsese,[78][79]James Ivory,[80]Abbas Kiarostami, Elia Kazan, François Truffaut,[81]Carlos Saura,[82]Isao Takahata[83] and Danny Boyle[84] have been influenced by his cinematic style, with many others such as Akira Kurosawa praising his work.[65]Gregory Nava's 1995 film *My Family* had a final scene that repeated that of *Apur Sansar*. Ira Sachs's 2005 work *Forty Shades of Blue* was a loose remake of *Charulata*. Other references to Ray films are found, for example, in recent works such as *Sacred Evil*,[85] the *Elements* trilogy of Deepa Mehta and even in films of Jean-Luc Godard.[86] According to Michael Sragow of *The Atlantic Monthly*, the "youthful coming-of-age dramas that have flooded art houses since the mid-fifties owe a tremendous debt to the *Apu* trilogy".[87] The trilogy also introduced the bounce lighting technique.[88]Kanchenjunga (1962) introduced a narrative structure that resembles later hyperlink cinema.[89]Pratidwandi (1972) helped pioneer photo-negative flashback and X-ray digression techniques.[90] Together with Madhabi Mukherjee, Ray was the first Indian film figure to be featured on a foreign stamp (Dominica).

Many literary works include references to Ray or his work, including Saul Bellow's *Herzog* and J. M. Coetzee's *Youth*. Salman Rushdie's *Haroun and the Sea of Stories* contains fish characters named Goopy and Bagha, a tribute to Ray's fantasy film. In 1993, UC Santa Cruz established the Satyajit Ray Film and Study collection, and in 1995, the Government of India set up Satyajit Ray Film and Television Institute for studies related to film. In 2007, British Broadcasting Corporation declared that two *Feluda* stories would be made into radio programs.[91] During the London Film Festival, a regular "Satyajit Ray Award" is given to a first-time feature director whose film best captures "the artistry, compassion and humanity of Ray's vision". Wes Anderson has claimed Ray as an influence on his work; his 2007 film, *The Darjeeling Limited*, set in India, is dedicated to Ray.

[edit] Awards, honours and recognitions

Ray received many awards, including 32 National Film Awards by the Government of India, and awards at international film festivals. At the 11th Moscow International Film Festival in 1979, he was awarded with the Honorable Prize for the contribution to cinema.[92] At the Berlin Film Festival, he was one of only three filmmakers to win the Silver Bear for Best Director more than once[93] and holds the record for the most number of Golden Bear nominations, with seven. At the Venice Film Festival, where he had previously won a Golden Lion for *Aparajito* (1956), he was awarded the Golden Lion Honorary Award in 1982.[94] That same year, he received an honorary "Hommage À Satyajit Ray" award at the 1982 Cannes Film Festival.[95]

Ray is the second film personality after Chaplin to have been awarded honorary doctorates by Oxford University.[96] He was awarded the Dadasaheb Phalke Award in 1985 and the Legion of Honor by the President of France in 1987.[97] The Government of India awarded him the highest civilian honour, Bharat Ratna shortly before his death.[97] The Academy of Motion Picture Arts and Sciences awarded Ray an honorary Oscar in 1992 for Lifetime Achievement. It was one of his favourite actresses, Audrey Hepburn, who represented the Academy of Motion Picture Arts and Sciences on that day in Calcutta. Ray, unable to attend the ceremony due to his illness, gave his acceptance speech to the Academy via live video feed in his home. In 1992 he was posthumously awarded the Akira Kurosawa Award for Lifetime Achievement in Directing at the San Francisco International Film Festival; it was accepted on his behalf by actress Sharmila Tagore.[98]

In 1992, the Sight & Sound Critics' Top Ten Poll ranked Ray at #7 in its list of "Top 10 Directors" of all time, making him the highest-ranking Asian



filmmaker in the poll.[99] In 2002, the Sight & Sound critics' and directors' poll ranked Ray at #22 in its list of all-time greatest directors,[100] thus making him the fourth highest-ranking Asian filmmaker in the poll.[100] In 1996, Entertainment Weekly magazine ranked Ray at #25 in its "50 Greatest Directors" list.[101] In 2007, Total Film magazine included Ray in its "100 Greatest Film Directors Ever" list.[102]

[edit] The Ray family

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Upendrakishore Ray

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Bidhumukhi

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Sandip Ray

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Awards for Satyajit Ray  
 Persondata  
 Name  
 Ray, Satyajit  
 Alternative names  
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 Short description  
 Film maker, writer  
 Date of birth  
 2 May 1921  
 Place of birth  
 Calcutta, India  
 Date of death  
 23 April 1992  
 Place of death  
 Calcutta

Ernest Augustus I (5 June 1771 – 18 November 1851) was King of Hanover from 20 June 1837 until his death. He was the fifth son and eighth child of George III, who reigned in both the United Kingdom and Hanover. As a fifth son, initially Ernest seemed unlikely to become a monarch, but Salic Law, which barred women from the succession, applied in Hanover and none of his older brothers had legitimate male issue. Therefore, he became King of Hanover when his niece, Victoria, became Queen of the United Kingdom, ending the personal union between Britain and Hanover that had existed since 1714.

Ernest was born in England, but was sent to Hanover in his adolescence for his education and military training. While serving with Hanoverian forces in Wallonia against Revolutionary France, he received a disfiguring facial wound. In 1799, he was created Duke of Cumberland and Teviotdale. Although his 1815 marriage to the twice-widowed Frederica of Mecklenburg-Strelitz met with the disapproval of his mother, Queen Charlotte, it proved a happy relationship. By 1817, the mad King George III had only one legitimate grandchild, Princess Charlotte of Wales, and when she died in childbirth, Ernest was the senior son to be both married and not estranged from his wife. This gave him some prospect of succeeding to the British throne. However, both of his unmarried older brothers quickly married, and King George's fourth son, Edward, Duke of Kent, fathered the eventual British heir, Princess Victoria of Kent (later Queen Victoria).

Ernest was active in the House of Lords, where he maintained an extremely conservative record. There were persistent allegations (reportedly spread by his political foes) that he had murdered his valet and had fathered a son by his sister, Princess Sophia of the United Kingdom. Before Victoria succeeded to the British Throne, it was rumoured that Ernest intended to murder her and take the Throne himself. When King William IV died on 20 June 1837, Ernest ascended the Hanoverian Throne. Hanover's first ruler to reside in the kingdom since George I, he had a generally successful fourteen-year reign, but excited

controversy when he dismissed the Göttingen Seven (including the two Brothers Grimm) from their professorial positions for agitating against his policies.

[edit] Early life (1771â ^1799)

Ernest Augustus, the fifth son of George III and Queen Charlotte, was born at Buckingham House, now part of Buckingham Palace on 5 June 1771. After leaving the nursery, he lived with his two younger brothers, Prince Adolphus (later Duke of Cambridge) and Prince Augustus (later Duke of Sussex), and a tutor in a house on Kew Green, near his parents' residence at Kew Palace. At the age of fifteen, he and his two younger brothers were sent to the University of Göttingen, located in his father's domain of Hanover. Though the King never left the United Kingdom in his life, he sent his younger sons to Germany in their adolescence. According to historian John Van der Kiste, this was done to limit the influence Ernest's eldest brother George, Prince of Wales, who was leading an extravagant lifestyle, would have over his younger brothers. Prince Ernest proved an apt student, and after being tutored privately for a year, while learning German, attended lectures at the University. Though King George ordered that the princes' household be run along military lines, and that they follow university rules, the town merchants proved willing to extend credit to the princes, and all three fell into debt.

In 1790, Ernest asked his father for permission to train with Prussian forces. Instead, in January 1791, he and Prince Adolphus were sent to Hanover to receive military training under the supervision of Field Marshal Wilhelm von Freytag. Before leaving Göttingen, Ernest penned a formal letter of thanks to the university, and wrote to his father, "I should be one of the most ungrateful of men if ever I was forgetful of all I owe to Göttingen & its professors."

Ernest learned cavalry drill and tactics under Captain von Linsingen of the Queen's Light Dragoons, and proved to be an excellent horseman as well as a good shot. After only two months of training, von Freytag was so impressed by the Prince's progress that he gave him a place in the cavalry as captain. Ernest was supposed to receive infantry training, but the King, also impressed by his son's prowess, allowed him to remain with the cavalry.

In March 1792, the King commissioned Prince Ernest Augustus as a colonel in the 9th Hanoverian Light Dragoons. The Prince served in the Low Countries in the War of the First Coalition, under his elder brother Frederick, Duke of York, then commander of the combined British, Hanoverian and Austrian forces. Seeing action near the Walloon town of Tournai in August 1793, he sustained a sabre wound to the head, which resulted in a disfiguring scar. During the Battle of Tourcoing in northern France on 18 May 1794 his left arm was injured by a cannonball which passed close by him. In the days after the battle, the sight in his left eye faded. In June, he was sent to Britain to convalesce, his first stay there since 1786.

Ernest resumed his duties in early November, by now promoted to major-general. He hoped his new rank would bring him a corps or brigade command, but none was forthcoming as Allied armies retreated slowly through the Netherlands towards Germany. By February 1795, they had reached Hanover. Ernest remained in Hanover over the next year, at several unimportant postings. He had requested a return home to seek treatment for his eye, but it was not until early 1796 that the King agreed and allowed Ernest to return to Britain. In Britain, Prince Ernest consulted the noted eye doctor, Wathen Waller, but Waller apparently found the condition inoperable, as no operation took place. Once in Britain, Ernest repeatedly sought to be allowed to join British forces on the Continent, even threatening to join the Yeomanry as a private, but both the King and the Duke of York refused. Ernest did not want to rejoin Hanoverian forces, as the Hanoverians were not then involved in the fighting. In addition, von Freytag was seriously ill, and Ernest was unwilling to serve under his likely successor, General von Wallmoden.

[edit] Duke of Cumberland (1799â ^1837)

[edit] Military commander

On 23 April 1799, George III created Prince Ernest Augustus Duke of Cumberland



and Teviotdale and Earl of Armagh. Though he was made a lieutenant-general, both of British and Hanoverian forces, he remained in England, and, with a seat in the House of Lords, entered politics. Ernest had extreme Tory views, and soon became a leader of the right of the party. King George had feared that Ernest, like some of his older brothers, would display Whig tendencies. Reassured on that point, in 1801, the King had Ernest conduct the negotiations which led to the formation of the Addington Government. In February 1802, King George granted his son the colonelcy of the 27th Light Dragoons, a post which offered the option of transfer to the colonelcy of the 15th Light Dragoons when a vacancy developed. A vacancy promptly occurred and the Duke became the colonel of the 15th Light Dragoons in March 1802. Although the post could have been a sinecure, Ernest involved himself in the affairs of the regiment and led it on manoeuvres.

In early 1803, the Duke of York appointed Ernest as commander of the Severn District, in charge of the forces in and around the Severn Estuary. When war with France broke out again after the Peace of Amiens, the elder Duke appointed Ernest to the more important Southwest District, comprising Hampshire, Dorset and Wiltshire. Though Ernest would have preferred command of the King's German Legion, composed mostly of expatriates from French-occupied Hanover, he accepted the post. The Duke of Cumberland increased the defences on the South Coast, especially around the town of Weymouth, where his father often spent time in the summer.

The 1800 Acts of Union had given Ireland representation in Parliament, but existing law prevented the Irish Catholics from serving there because of their religion. "Catholic emancipation" was a major political issue of the first years of the 19th century. The Duke of Cumberland was a strong opponent of giving political rights to Catholics, believing that emancipation would be a violation of the King's Coronation Oath to uphold Anglicanism, and spoke out in the House of Lords against emancipation. Protestant Irish organisations supported the Duke; he was elected Chancellor of the University of Dublin in 1805 and Grand Master of the Orange Lodges two years later.

The Duke repeatedly sought a post with Allied forces fighting against France, but was sent to the Continent only as an observer. In 1807, he advocated sending British troops to join with the Prussians and Swedes and attack the French at Stralsund (today, in northeastern Germany). The Greville government refused to send forces. Shortly afterwards, the government fell, and the new Prime Minister, the Duke of Portland, agreed to send Ernest with 20,000 troops. However, they were sent too late: the French defeated Prussia and Sweden at the Battle of Stralsund before Ernest and his forces could reach the town.

[edit] Sellis incident and Weymouth controversy

In the early hours of 31 May 1810, Ernest, by his written account, was struck in the head several times while asleep in bed, awakening him. He ran for the door, where he was wounded in the leg by a sabre. He called for help, and one of his valets, Cornelius Neale, responded and aided him. Neale raised the alarm, and the household soon realised that Ernest's other valet, Joseph Sellis, was not among them, and that the door to Sellis's room was locked. The lock was forced, and Sellis was discovered with his throat freshly cut, a wound apparently self-inflicted. Ernest received several serious wounds during the apparent attack, and required over a month to recover from his injuries. The social reformer and anti-monarchist Francis Place managed to get on the inquest jury and became its foreman. Place went to the office of a barrister friend to study inquest law, and aggressively questioned witnesses. Place also insisted the inquest be opened to the public and press, and so cowed the coroner that he basically ran the inquest himself. Nevertheless, the jury returned a unanimous verdict of suicide against Sellis.

Much of the public blamed Ernest for Sellis's death. The more extreme Whig papers, anti-royal pamphleteers, and caricaturists all offered nefarious explanations for Sellis's death, in which the Duke was to blame. Some stories had the Duke cuckolding Sellis, with the attack as retaliation, or Sellis killed for finding Ernest and Mrs. Sellis in bed together. Others suggested

that the Duke was the lover of either Sellis or Neale, and that blackmail had played a part in the death. Both Roger Fulford and John Van der Kiste, who wrote books about George III's children, ascribe part of the animus and fear towards the Duke to the fact that he did not conduct love affairs in public, as did his older brothers. According to them, the public feared what vices might be going on behind the locked doors of the Duke's house, and assumed the worst.

In early 1813, Ernest was involved in political scandal during an election contest in Weymouth following the general election the previous year. The Duke was shown to be one of three trustees who were able to dictate who would represent Weymouth in Parliament. It being considered improper for a peer to interfere in a Commons election, there was considerable controversy, and the Government sent Ernest to Europe as an observer to accompany Hanoverian troops, which were again engaged in war against France. Though he saw no action, Ernest was present at the Battle of Leipzig, a major victory for the Allies.

#### [edit] Marriage

Ernest met and fell in love in mid-1813 with his first cousin, Frederica of Mecklenburg-Strelitz, wife of Prince Frederick William of Solms-Braunfels and widow of Prince Louis of Prussia. The two agreed to wed if Frederica became free to marry. Her marriage to Frederick William had not been a success; her husband, seeing the marriage was beyond hope, agreed to a divorce, but his sudden death in 1814 removed the necessity. Some considered the death too convenient, and suspected the princess of poisoning her husband. Queen Charlotte opposed the marriage: before the princess had married Frederick William, she had jilted Ernest's brother, the Duke of Cambridge, after the engagement was announced.

Following the marriage in Germany on 29 May 1815, Queen Charlotte refused to receive her new daughter-in-law, nor would the Queen attend the resolemnisation of the Cumberlands' marriage at Kew, which Ernest's four older brothers attended. The Prince of Wales (now Prince Regent) found the Cumberlands' presence in Britain embarrassing, and offered him money and the Governorship of Hanover if they would leave for the Continent. Ernest refused, and the Cumberlands divided their time between Kew and St. James's Palace for the next three years. The Queen remained obstinate in her refusal to receive Frederica. Despite these family troubles, the Cumberlands had a happy marriage. The Government of Lord Liverpool asked Parliament to increase the Duke's allowance by £6,000 per year in 1815 (equal to about £386,000 today),<sup>[41]</sup> so he could meet increased expenses due to his marriage. The Duke's involvement in the Weymouth election became an issue, and the bill failed by one vote. Liverpool tried again in 1817; this time the bill failed by seven votes.

At the time of the Duke's marriage in 1815, it seemed to have little dynastic significance to Britain. Princess Charlotte of Wales, only child of the Prince Regent, was the King's only legitimate grandchild. The young Princess was expected to have children who would secure the British succession, especially after she married Prince Leopold of Saxe-Coburg-Saalfeld in 1816. Both the Prince Regent and the Duke of York were married but estranged from their wives, while the next two brothers, the Dukes of Clarence and Kent, were unmarried. On 6 November 1817, Princess Charlotte died after delivering a stillborn son. King George was left with twelve surviving children, and no surviving legitimate grandchildren. Most of the unmarried royal dukes hurriedly sought out suitable brides and hastened to the altar, hoping to father the heir to the throne.

Seeing little prospect of the Queen giving in and receiving her daughter-in-law, the Cumberlands moved to Germany in 1818. They had difficulty living within their means in Britain, and the cost of living was much lower in Germany. Queen Charlotte died on 17 November 1818, but the Cumberlands remained in Germany, living principally in Berlin, where the Duchess had relatives. In 1817, the Duchess had a stillborn daughter; in 1819 she gave birth to a boy, Prince George of Cumberland. The Duke occasionally visited England, where he stayed with his eldest brother, who in 1820 succeeded to the British and Hanoverian Thrones as George IV. George III's fourth son, Edward, Duke of Kent, died six days before his father, but left a daughter, Princess Victoria of

Kent. With the death of George III, Ernest became fourth in line to the British Throne, following the Duke of York (who would die without legitimate issue in 1827), the Duke of Clarence, and Princess Victoria.

[edit] Politics and unpopularity

In 1826, Parliament finally voted to increase Ernest's allowance. The Liverpool Government argued that the Duke needed an increased allowance to pay for Prince George's education; even so, it was opposed by many Whigs. The bill, which passed the House of Commons 120â ^97, required Prince George to live in England if the Duke was to receive the money.

In 1828, Ernest was staying with the King at Windsor Castle when severe disturbances broke out in Ireland among Catholics. The Duke was an ardent supporter of the Protestant cause in Ireland, and returned to Berlin in August, believing that the Government, led by the Duke of Wellington, would deal firmly with the Irish. In January 1829, the Wellington Government announced that it would introduce a Catholic emancipation bill to conciliate the Irish. Disregarding a request from Wellington that he remain abroad, Ernest returned to London, and was one of the leaders against the Catholic Relief Act 1829, influencing King George against the bill. Within days of his arrival, the King instructed the officers of his Household to vote against the Bill. Hearing of this, Wellington told the King that he must resign as Prime Minister unless the King could assure him of complete support. The King initially accepted Wellington's resignation, and Ernest attempted to put together a government united against Catholic emancipation. Though such a government would have considerable support in the House of Lords, it would have little support in the Commons, and Ernest abandoned his attempt. The King recalled Wellington. The bill passed the Lords and became law.

The Wellington Government hoped that Ernest would return to Germany, but he moved his wife and son to Britain in 1829. The Times reported that they would live at Windsor in the "Devil's Tower"; instead, the Duke reopened his house at Kew. They settled there as rumours flew that Thomas Garth, thought to be the illegitimate son of Ernest's sister Princess Sophia, had been fathered by Ernest. It was also said that Ernest had blackmailed the King by threatening to expose this secret, though Van der Kiste points out that Ernest would have been ill-advised to blackmail with a secret which, if exposed, would destroy him. These rumours were spread as Ernest journeyed to London to fight against Catholic emancipation. Whig politician and diarist Thomas Creevey wrote about the Garth rumour in mid-February, and there is some indication the rumours began with Princess Lieven, wife of the Russian ambassador.

Newspapers also reported, in July 1829, that the Duke had been thrown out of Lord Lyndhurst's house for assaulting his wife Sarah, Lady Lyndhurst. In early 1830, a number of newspapers printed articles hinting that Ernest was having an affair with Lady Graves, a mother of fifteen now past fifty.[a] In February 1830, Lord Graves wrote a note to his wife expressing his confidence in her innocence, then cut his own throat. Two days after Lord Graves's death (and the day after the inquest), The Times printed an article connecting Lord Graves's death with Sellis's. After being shown the suicide note, The Times withdrew its implication there might be a connection between the two deaths. Nonetheless, many believed the Duke responsible for the suicideâ ~or guilty of a second murder.[b] The Duke later stated that he had been "accused of every crime in the decalogue". Ernest's biographer, Anthony Bird, states that while there is no proof, he has no doubt that the rumours against the Duke were spread by the Whigs for political ends. Another biographer, Geoffrey Willis, pointed out that no scandal had attached itself to the Duke during the period of over a decade when he resided in Germany; it was only when he announced his intent to return to Britain that "a campaign of unparalleled viciousness" began against him. According to Bird, Ernest was the most unpopular man in England.

The Duke's influence at Court was ended by the death of George IV in June 1830 and the succession of the Duke of Clarence as William IV. Wellington wrote that "The effect of the King's death willÂ ... be to put an end to the Duke of Cumberland's political character and power in this country entirely". King

William lacked legitimate children (two girls having died in infancy) and Ernest was now heir-presumptive in Hanover, since the British heir-presumptive, Victoria, as a female could not inherit there. William realized that so long as the Duke maintained a power base at Windsor, he could wield unwanted influence. The Duke was Gold Stick as head of the Household Cavalry; William made the Duke's post responsible to the Commander in Chief rather than to the King, and an insulted Ernest, outraged at the thought of having to report to an officer less senior than himself, resigned. King William again emerged triumphant when the new queen, Adelaide of Saxe-Meiningen, wished to quarter her horses in the stables customarily used by the consort, but which were then occupied by Ernest's horses. Ernest initially refused the King's order to remove the horses, but gave in when told that William's grooms would remove them if Ernest did not move them voluntarily. However, Ernest and William remained friendly throughout the latter's seven-year reign. Ernest's house at Kew was too small for his family; the King gave the Duke and Duchess lifetime residence in a nearby, larger house by the entrance to Kew Gardens. Ernest opposed the Reform Act 1832, and was one of the "diehard" peers who voted against the bill on its final reading when most Tories abstained under threat of seeing the House of Lords flooded with Whig peers.

Ernest was the subject of more allegations in 1832, when two young women accused him of trying to ride them down as they walked near Hammersmith. The Duke had not left his grounds at Kew on the day in question, and was able to ascertain that the rider was one of his equeuries, who professed not to have seen the women. Nevertheless, newspapers continued to print references to the incident, suggesting that Ernest had done what the women stated, and was cravenly trying to push blame on another. The same year, the Duke sued for libel after a book appeared accusing him of having his valet Neale kill Sellis, and the jury found against the author.[c] Also in 1832, the Cumberlands suffered tragedy, as young Prince George went blind. The Prince had been blind in one eye from infancy; an accident at age thirteen took the sight of the other. Ernest had hoped his son might marry Princess Victoria and keep the British and Hanoverian Thrones united, but the handicap made it unlikely George could win Princess Victoria's hand, and raised questions about whether he should succeed in Hanover.

The Duke spent William's reign in the House of Lords, where he was assiduous in his attendance. Wrote newspaper editor James Grant, "He is literallyâ ~the door-keeper of course exceptedâ ~the first man in the House, and the last out of it. And this not merely generally, but every night." Grant, in his observations of the leading members of the House of Lords, indicated that the Duke was not noted for his oratory (he delivered no speech longer than five minutes) and had a voice that was difficult to understand, though, "his manner is most mild and conciliatory." Grant denigrated the Duke's intellect and influence, but stated that the Duke had indirect influence over several members, and that, "he is by no means so bad a tactician as his opponents suppose."

Controversy arose in 1836 over the Orange Lodges. The lodges (which took anti-Catholic views) were said to be ready to rise and try to put the Duke of Cumberland on the Throne on the death of King William. According to Joseph Hume, speaking in the House of Commons, Princess Victoria was to be passed over on the grounds of her age, sex, and incapacity. The Commons passed a resolution calling for the dissolution of the lodges. When the matter reached the Lords, the Duke defended himself, saying of Princess Victoria, "I would shed the last drop of my blood for my niece." The Duke indicated that the Orange Lodge members were loyal and were willing to dissolve the lodges in Great Britain. According to Bird, this incident was the source of the widespread rumours that the Duke intended to murder Princess Victoria and take the British Throne for himself.

[edit] King of Hanover (1837â ~1851)

[edit] Domestic affairs

[edit] Constitutional controversy

On 20 June 1837, King William died, and Princess Victoria became Queen of the

United Kingdom. Ernest became the King of Hanover. On 28 June 1837, King Ernest entered his new domain, passing under a triumphal arch. For the first time in over a century, Hanover would have a ruler living there. Many Hanoverians were of a liberal perspective, and would have preferred the popular viceroy, the Duke of Cambridge, to become king, but both of Ernest's younger brothers refused to lend themselves to any movement by which they would become king rather than their elder brother. According to Roger Fulford in his study of George III's younger sons, Royal Dukes, "In 1837, King Ernest was the only male descendant of George III who was willing and able to continue the connection with Hanover." [d]

Hanover had received its first constitution, granted by the Prince Regent, in 1819; this did little more than denote Hanover's change from an electorate to a kingdom, granted by the Congress of Vienna. The Duke of Cambridge, as King William's viceroy in Hanover, recommended a thorough reorganisation of the Hanoverian government. William IV had given his consent to a new constitution in 1833; the Duke of Cumberland's consent was neither asked nor received, and he had formally protested against the constitution's adoption without his consent. One provision of the constitution transferred the Hanoverian Domains (the equivalent of the British Crown Estate) from the sovereign to the state, eroding the monarch's power.

Immediately upon his arrival in Hanover, the King dissolved the parliament which had been convened under the disputed constitution. On 5 July, he proclaimed the suspension of the constitution, on the ground that his consent had not been asked, and that it did not meet the kingdom's needs. On 1 November 1837, the King issued a patent, declaring the constitution void, but upholding all laws passed under it. The 1819 constitution was restored. The Crown Prince, Prince George, endorsed the action.

In carrying the King's patent into effect, the Cabinet required all officeholders (including professors at Göttingen University) to renew their oaths of allegiance to the King. Seven professors (including the two Brothers Grimm) refused to take the oaths, and agitated for others to protest against the King's decree. Since they did not take the oaths, the seven lost their positions, and the King expelled the three most responsible (including Jacob Grimm) from Hanover. Only one of the seven, orientalist Heinrich Ewald was a citizen of Hanover and he was not expelled. In the final years of the King's reign, the three were invited to return.

The King wrote of the incident to his brother-in-law, Frederick William III of Prussia, "If each of these seven gentlemen had addressed a letter to me expressing his opinion, I would have had no cause to take exception to their conduct. But to call a meeting and publish their opinions even before the Government had received their protestâ ~that is what they have done and that I cannot allow." Ernest received a deputation of Göttingen citizens, who, fearing student unrest, applauded the dismissals. However, he was widely criticised in Europe, especially in Britain. In the House of Commons, MP Colonel Thomas Perronet Thompson proposed to Parliament that if the as-yet-childless Queen Victoria died, making Ernest the British King, Parliament should declare that King Ernest had forfeited all rights to the British Throne by his actions.

A more significant protest against the revocation of the 1833 constitution was the refusal of a number of towns to appoint parliamentary deputies. However, by 1840, a sufficient number of deputies had been appointed for the King to summon Parliament, which met for two weeks in August, approving a modified version of the 1819 constitution, passing a budget, and sending a vote of thanks to the King. The Parliament met again the following year, passed a three-year budget, and adjourned again.

[edit] National development and trade; 1848 crisis

At the time the King took the throne, the city of Hanover was a densely packed residential town, and did not rise to the grand style of many German capitals. Once the political crises of the first years of his reign had subsided, he set out to remedy this state of affairs. Ernest's support led to gas lighting in the city streets of Hanover, up-to-date sanitation and the development of a new

residential quarter. He had the plans altered in 1841, after Queen Frederica's death, to leave standing the Altes Palais, where the two had lived since arriving in Hanover. Ernest's interest in and support of the railroads led to Hanover becoming a major rail junction, much to the nation's benefit. However, when court architect Georg Ludwig Friedrich Laves in 1837 proposed the building of an opera house in Hanover, the King initially refused, calling the proposal "this utterly absurd idea of building a court theatre in the middle of this green field". The King finally gave his consent in 1844, and the opera house opened in 1852, a year after the King's death.

Every week, the King travelled with his secretary to different parts of his kingdom, and anyone could lay a petition before him although Ernest had petitions screened by the secretary so he would not have to deal with frivolous complaints. Ernest opened high ministerial positions to those of any class, securing the services of several ministers who would not have been eligible without this reform. Though the King had, while Duke of Cumberland, fought against Catholic emancipation, he made no objection to Catholics in government service in Hanover, and even visited their churches. Ernest explained this by stating that there were no historical reasons to restrict Catholics in Hanover, as there had been in the United Kingdom. He continued to oppose admission of Jews into the British Parliament, but gave Jews in Hanover equal rights.

The King supported a postal union and common currency among the German states, but opposed the Prussian-led customs union, the Zollverein, fearing that it would lead to Prussian dominance and the end of Hanover as an independent state. Instead, the King supported the Steuerverein, which Hanover and other western German states had formed in 1834. When the Steuerverein treaties came up for renewal in 1841, Brunswick pulled out of the union and joined the Zollverein, greatly weakening Hanover's position, especially since Brunswick had enclaves within Hanover. Ernest was able to postpone the enclaves' entry into the Zollverein, and when a trade war began, was able to outlast Brunswick. In 1845, Brunswick, Hanover, and Prussia signed a trade agreement. In 1850, Ernest reluctantly permitted Hanover to join the Zollverein, though the entry was on favourable terms. Ernest's forebodings about Prussia were warranted; in 1866, fifteen years after his death, Hanover chose the Austrian side in the Austro-Prussian War, was defeated, and was annexed by Prussia.

Hanover was little affected by the revolutions of 1848; a few small disturbances were put down by the cavalry without bloodshed. When agitators arrived from Berlin at the end of May 1848, and there were demonstrations outside the King's palace, Ernest sent out the Prime Minister. The Prime Minister warned that if the demonstrators made any inappropriate demands on the King, Ernest would pack up his things and leave for Britain, taking the Crown Prince with him. This would leave the country to the mercy of expansionist Prussia, and the threat put an end to the agitation. Afterwards, the King granted a new constitution, somewhat more liberal than the 1819 document.

#### [edit] Relations with Britain

Ernest Augustus is supposed to have asked the advice of the Duke of Wellington as to what course he should take after Victoria's accession, with Wellington supposedly saying "Go before you are pelted out." However, Bird dismisses this story as unlikely, given Wellington's customary respect to royalty and the fact that Ernest had little choice in what to do as he had to repair to his kingdom as quickly as possible. One decision the new King did have to make was whether, in his capacity as Duke of Cumberland, to swear allegiance to Victoria in the House of Lords. Shortly after William's death, Ernest heard from Lord Lyndhurst that Lord Cottenham, the Lord Chancellor, had stated that he would refuse to administer the Oath of Allegiance to the King, as a foreign Sovereign. The King hurriedly appeared in the House of Lords, before his departure for Hanover, and subscribed to the Oath before the Chief Clerk as a matter of routine. Ernest was heir presumptive to his niece until the birth of Queen Victoria's daughter, also named Victoria, in November 1840. The Lord Privy Seal, Lord Clarendon, wrote, "What the country cares about is to have a life more, whether male or female, between the succession and the King of Hanover."

British Royalty  
House of Hanover  
George III  
George IV  
Frederick, Duke of York  
William IV  
Charlotte, Queen of Württemberg  
Edward, Duke of Kent  
Princess Augusta Sophia  
Elizabeth, Landgravine of Hesse-Homburg  
Ernest Augustus I of Hanover  
Augustus Frederick, Duke of Sussex  
Adolphus, Duke of Cambridge  
Mary, Duchess of Gloucester  
Princess Sophia  
Princess Amelia  
Grandchildren  
Charlotte, Princess Leopold of Saxe-Coburg-Saalfeld  
Victoria  
George V, King of Hanover  
George, Duke of Cambridge  
Augusta, Grand Duchess of Mecklenburg-Strelitz  
Mary Adelaide, Duchess of Teck

Almost immediately upon going to Hanover, the King became involved in a dispute with his niece. Victoria, who had a strained relationship with her mother, the Duchess of Kent, wanted to give the Duchess accommodation near her, for the sake of appearancesâ ~but not too near her. To that end, she asked the King to give up his apartments at St. James's Palace in favour of the Duchess. The King, wishing to retain apartments in London in anticipation of frequent visits to England, and reluctant to give way in favour of a woman who had frequently fought with his brother, King William, declined, and Victoria angrily rented a house for her mother. At a time when the young Queen was trying to pay off her father's debts, she saw this as unnecessary expense. Her ill-feeling towards the King increased when he refused, and advised his two surviving brothers to similarly refuse, to give precedence to her intended spouse, Albert of Saxe-Coburg and Gotha. Ernest argued that the standing of the various royal families had been settled at the Congress of Vienna, and the King of Hanover should not have to yield to one whom he described as a "paper Royal Highness". The act which naturalised Albert as a British subject left the question of his precedence unresolved.

Matters came to a head when Ernest returned for what would prove to be his only visit to England as King of Hanover, in 1843. He was welcomed warmly, everywhere but at the Palace. At the wedding of Princess Augusta of Cambridge, he attempted to insist on a superior place to that of Prince Albert. The 50-years-younger prince settled things with what Albert described as a "strong push", and carefully wrote his name on the certificate under the Queen's, so close to his wife's as to leave no space for the King's signature. The King apparently held no grudge, as he invited the Prince for a stroll in the park. When Albert demurred on the grounds that they might be jostled by crowds, the King replied, "When I lived here I was quite as unpopular as you are and they never bothered me." Shortly after the wedding, the King injured himself in a fall, with Albert writing to his brother, "Happily he fell over some stones in Kew and damaged some ribs." This injury spared him further contact with Victoria and Albert. During his visit, the King found time to take his place as Duke of Cumberland in the House of Lords. Victoria recorded in her journal that the King had stated when asked if he would speak in the Lords, "No, I shall not, unless the Devil prompts me!" The Queen also recorded that though King Ernest greatly enjoyed listening to the debates, he did not himself speak.

The monarchs engaged in one more battleâ ~over jewels left by Queen Charlotte. Victoria, who possessed them, took the position that they belonged to the

British Crown. King Ernest maintained that they were to go to the heir male, that is, himself. The matter was arbitrated, and just as the arbitrators were about to announce a decision in Hanover's favour, one of the arbitrators died, voiding the decision. Despite the King's request for a new panel, Victoria refused to permit one during the King's lifetime, and took every opportunity to wear the jewels, causing the King to write to his friend, Lord Strangford, "The little Queen looked very fine, I hear, loaded down with my diamonds." The King's son and heir, King George V, pressed the matter, and in 1858, after another decision in Hanover's favour, the jewels were turned over to the Hanoverian ambassador.

The King made a point of welcoming British visitors, and when one Englishwoman told him that she had been lost in the city, the King denied that this was possible, as "the whole country is no larger than a fourpenny bit."

[edit] Later life, death, and memorial

In 1851, the King undertook a number of journeys around Germany. He accepted an invitation from the Prussian Queen-consort to visit Charlottenburg Palace, near Berlin. He visited Mecklenburg for the christening of the Grand Duke's son, and Lüneburg to inspect his old regiment. In June Ernest celebrated his 80th birthday by playing host to the King of Prussia. Late that summer, he visited Göttingen, where he opened a new hospital and was given a torchlight procession.

The King continued his interest in British affairs, and wrote to Lord Strangford about the Great Exhibition of 1851:

The folly and absurdity of the Queen in allowing this trumpery must strike every sensible and well-thinking mind, and I am astonished the ministers themselves do not insist on her at least going to Osborne during the Exhibition, as no human being can possibly answer for what may occur on the occasion. The idea ... must shock every honest and well-meaning Englishman. But it seems everything is conspiring to lower us in the eyes of Europe.

The King died on 18 November 1851 after an illness of about a month. He was mourned greatly in Hanover; less so in England where The Times omitted the customary black border to its front page and claimed "the good that can be said of the Royal dead is little or none." Both he and Queen Frederica rest in a mausoleum in the Herrenhausen Gardens.

A large equestrian statue of King Ernest Augustus may be found in a square named after him in front of Hanover Central Station, inscribed with his name and the words (in German) "To the father of the nation from his loyal people." It is a popular meeting place; in the local phrase, people arrange to meet unterm Schwanz or "under the tail" (that is, of the horse which the King rides).

Although The Times denigrated Ernest's career as Duke of Cumberland, it did speak well of his time as King of Hanover, and of his success in keeping Hanover stable in 1848:

Above all, he possessed a resolute decision of character, which, however unfortunately it may have operated under different conditions, appeared to extraordinary advantage at the crisis of continental thrones. Bewildered by the revolutionary din, and oscillating ignominiously between fear and rage, resistance and concession, the clique of crowned heads suffered greatly by contrast with a Sovereign who at least knew his own mind, and was prepared to abide by his opinions. In the European convulsions, therefore, King Ernest maintained the stability of his throne and the tranquillity of his people without damage from revolution or reaction. As Kings, indeed, are computed on the continent, he was an able and even a popular Monarch, and his memory may find, perhaps, in his ancestral dominions a sympathy which it would be vain to bespeak for it in the scenes of his manhood or the land of his birth.

[edit] Ancestors



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21. Duchess Magdalena Sibylle of Saxe-Weissenfels

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5. Princess Augusta of Saxe-Gotha

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22. Karl, Prince of Anhalt-Zerbst

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11. Princess Magdalena Augusta of Anhalt-Zerbst

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23. Duchess Sophia of Saxe-Weissenfels

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1. Ernest Augustus I of Hanover

24. Adolf Frederick I, Duke of Mecklenburg-Schwerin

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12. Adolphus Frederick II, Duke of Mecklenburg-Strelitz

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25. Duchess Maria Katharina of Brunswick-Dannenberg

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6. Duke Charles Louis Frederick of Mecklenburg-Strelitz, Prince of Mirow

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29. Countess Sophie of Waldeck

## 7. Princess Elizabeth Albertine of Saxe-Hildburghausen

30. George Louis I, Count of Erbach-Erbach

15. Countess Sophia Albertine of Erbach-Erbach

31. Countess Amelie Katherine of Waldeck-Eisenberg

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## Explanatory notes

^ Fulford 1933, p.Â 235. "For some months, the newspapers had been hinting at an amour between the Duke and a certain Lady Graves."  
^ Fulford 1933, pp.Â 235â ^236. "... and inevitably had the effect of making the public believe that the Duke had murdered Lord Graves as well as Sellis."  
^ Bird 1966, pp.Â 221â ^224. "but sneering references to the Duke's supposed misdemeanour and his cowardice in trying to blame it on an equerry continued to appear".  
^ Fulford 1933, p.Â 244. "the rather opinionated Liberalism of the Hanoverians"  
"The Duke of Cambridge loyally refused to listen to the whispers that he should supersede King Ernest".

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### Online sources

The generations indicate descent from George I, who formalised the use of the titles prince and princess for members of the British Royal Family.

1st generation

2nd generation

3rd generation

4th generation

5th generation

6th generation

7th generation

8th generation

9th generation

10th generation

11th generation

### Persondata

Name

Ernest Augustus I of Hanover

Alternative names

Ernest Augustus, Duke of Cumberland; Prince Ernest Augustus; Ernst August (German)

Short description

King of Hanover (1837â ^1851)

Date of birth

5 June 1770

Place of birth

London

Date of death

18 November 1850

Place of death

Hanover

[Main Page](#)

From Wikipedia, the free encyclopedia

From today's featured article

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 11â ^0 victory over StrÅ,msgodset in the 1974â ^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...)

Recently featured: Interstate 80 Business (West Wendover, Nevadaâ ^Wendover, Utah)â ^ 2005 Qeshm earthquakeâ ^ Verpa bohémica

Did you know...

In the news

On this day...

February 12: Mardi Gras and Shrove Tuesday in Western Christianity (2013); Darwin Day; Red Hand Day

1541 â ^ Spanish conquistador Pedro de Valdivia founded Santiago, today the capital of Chile, as Santiago del Nuevo Extremo.

1855 â ^ 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.

2001 ^ NASA's robotic space probe NEAR Shoemaker touched down on Eros (pictured), becoming the first spacecraft to land on an asteroid.

More anniversaries: February 11 ^ February 12 ^ February 13

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This Wikipedia is written in English. Started in 2001 (2001), it currently contains 4,164,169 articles. Many other Wikipedias are available; some of the largest are listed below.

The Rodrigues Solitaire (*Pezophaps solitaria*) is an extinct, flightless bird that was endemic to the island of Rodrigues, east of Madagascar in the Indian Ocean. Genetically within pigeons and doves, it was most closely related to the also extinct Dodo of Mauritius (the two forming the subfamily Raphinae). The Nicobar Pigeon is their closest living genetic relative.

The size of a swan, the Rodrigues Solitaire demonstrated pronounced sexual dimorphism. Males were much larger than females and measured up to 90 centimetres (35 inches) in length and 28 kilograms (62 pounds) in weight, contrasting with 70 centimetres (28 inches) and 17 kilograms (37 pounds) for females. Its plumage was grey and brown; the female was paler than the male. It

had a black band at the base of its slightly hooked beak, and its neck and legs were long. Both sexes were highly territorial, with large bony knobs on their wings that were used in combat. The Rodrigues Solitaire laid a single egg, that was incubated in turn by both sexes. Gizzard stones helped digest its food, which included fruit and seeds.

First mentioned during the 17th century, the Rodrigues Solitaire was described in detail by François Leguat (leader of a group of French Huguenot refugees who were marooned on Rodrigues in 1691–1693). It was hunted by humans and introduced animals, and was extinct by the late 1700s. Apart from Leguat's account and drawing, and a few other contemporary descriptions, nothing was known about the bird until a few subfossil bones were found in a cave in 1789. Thousands of bones have subsequently been excavated. It is the only extinct bird with a former star constellation named after it, *Turdus Solitarius*.

[edit] Taxonomy

François Leguat was the first to refer to the bird as the "Solitaire" (referring to its solitary habits), but it has been suggested that he borrowed the name from a tract mentioning the Réunion Solitaire. The bird was first scientifically named as a species of Dodo (*Didus solitarius*, based on Leguat's description) by Johann Friedrich Gmelin in the thirteenth edition of *Systema Naturae*. Hugh Edwin Strickland and Alexander Gordon Melville suggested the common descent of the Rodrigues Solitaire and the Dodo in 1848. They dissected the only known Dodo specimen with soft tissue, comparing it with the few Rodrigues Solitaire remains then available.[7] Strickland stated that although not identical, these birds shared many distinguishing features in the leg bones otherwise only known in pigeons. The fact that the Rodrigues Solitaire laid only one egg, fed on fruits, was monogamous and cared for its nestlings also supported this relationship. Strickland recognized its generic distinction and named the new genus *Pezophaps*, which means "pedestrian pigeon" in ancient Greek.[8] The differences between the sexes of the bird were so large that Strickland thought they belonged to two species, naming the smaller bird *Pezophaps minor*. Later study of skeletal features by Alfred and Edward Newton indicated that the Solitaire was morphologically intermediate between the Dodo and ordinary pigeons, but differed from them in its unique wrist-knob.

The term "Solitaire" has also been used for other species with "solitary" habits, such as the Réunion Ibis. Some scientists believed that Réunion was home to not only a white Dodo, but also a white bird similar to the Rodrigues Solitaire, both of which are now believed to be misinterpretations of old reports of the ibis. 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 nazareus*; it is now a junior synonym of this species.

For a long time the Dodo and the Rodrigues Solitaire (collectively termed "didines") were placed in a family of their own, the Raphinae; this was because their relationships to other pigeons was unresolved. They were also placed in a monotypic family each, Raphidae and Pezophapidae, respectively, due to the suggestion that they had evolved their similar features independently. Recently, osteological and molecular data led to the dissolution of the family Raphidae, and the Dodo and Rodrigues Solitaire were placed in their own subfamily, Raphinae, nested within the Columbidae.

[edit] Evolution

Comparison of mitochondrial cytochrome b and 12S rRNA sequences isolated from the femur of a Rodrigues Solitaire and the tarsal of a Dodo confirmed their close relationship, and their placement within the Columbidae. Genetic evidence was interpreted to show that the Southeast Asian Nicobar Pigeon is their closest living relative, followed by Crowned Pigeons of New Guinea, and the superficially Dodo-like Tooth-billed Pigeon from Samoa. The following cladogram, from Shapiro et al. (2002), shows the Dodo's closest relationships within Columbidae, a clade consisting of generally ground-dwelling island endemics.

A similar cladogram was published in 2007, differing in the inverted placement

of Goura and Didunculus, as well as the inclusion of the Pheasant Pigeon and the Thick-billed Ground Pigeon at the base of the clade. The 2002 study indicated that the ancestors of the Rodrigues Solitaire and the Dodo diverged around the Paleogene-Neogene boundary. The Mascarene Islands, Mauritius, Réunion, and Rodrigues, are of volcanic origin and less than 10 million years old, so the ancestors of both birds likely remained capable of flight long after the separation of their lineages. The lack of mammalian herbivores competing for resources on these islands allowed the Rodrigues Solitaire and the Dodo to attain large size. The DNA obtained from the Oxford specimen is degraded, and no usable DNA has been extracted from fossil remains, so these findings still need to be independently verified.

#### [edit] Description

One observer described the Rodrigues Solitaire as the size of a swan. Sexual size dimorphism in this species is perhaps the greatest in any carinate bird. Males were considerably larger than females, measuring 90 cm (35 inches) in length and weighing up to 28 kg (62 pounds), whereas females were 70 cm (28 inches) and weighed 17 kg (37 pounds). Their weight may have varied substantially due to fat cycles, meaning that individuals were fat during cool seasons, but slim during hot seasons, and may have been as low as 21 kg in males and 13 kg in females. Their plumage was grey and brown. Females were paler than males and had light-coloured elevations on the lower neck. A black band (a contemporary description describes it as a "frontlet"[a]) appears on its head just behind the base of its beak. Its beak was slightly hooked, and its neck and legs were long. The skull was 170 millimetres (6.7 in) long, flattened at the top with the fore and hind parts elevated into two bony ridges structured with cancellous bone. Both sexes possessed a large a tuberos knob of bone situated at the base of the carpometacarpus of each wrist. The knobs were about half the length of the metacarpus, and were larger in males than females. In life, these knobs would have been covered by tough skin and used as weapons.

The Rodrigues Solitaire shared traits with the Dodo, its closest relative, such as size and features in the skull, pelvis and sternum. It differed in other aspects; it was taller and more slender than the Dodo and had a smaller skull and beak, a flatter skull roof and larger orbits. Its neck and legs were proportionally longer, and the Dodo did not possess a wrist-knob equivalent. Many skeletal features of the Rodrigues Solitaire and Dodo that are unique among pigeons have evolved to adapt to flightlessness. Their pelvic elements were thicker than those of flighted birds (to support their greater weight), and their pectoral region and wings were paedomorphic (underdeveloped, retaining juvenile features). However, the skull, trunk and pelvic limbs were peramorphic, which means they changed considerably with maturity.

#### [edit] Contemporary accounts

Apart from François Leguat's rather simple depiction, the life appearance of the Rodrigues Solitaire is only known from a handful of descriptions; no soft-tissue remains survive. Leguat devoted three pages of his memoirs to the Rodrigues Solitaire, and was clearly impressed by the bird. He described its appearance as follows:

Of all the Birds in the Island the most remarkable is that which goes by the name of the solitary, because it is very seldom seen in company, tho' there are abundance of them. The Feathers of the Males are of a brown grey Colour: the Feet and Beak are like a Turkey's, but a little more crooked. They have scarce any Tail, but their Hind-part covered with Feathers is roundish, like the Crupper [rump] of a horse; they are taller than Turkeys. Their Neck is straight, and a little longer in proportion than a Turkey's when it lifts up his Head. Its Eye is Black and lively, and its Head without Comb or Cop. They never fly, their Wings are too little to support the Weight of their Bodies; they serve only to beat themselves, and flutter when they call one another. They will whirl about for twenty or thirty times together on the same side, during the space of four or five minutes. The motion of their Wings makes then

a noise very like that of a Rattle; and one may hear it two hundred Paces off. The Bone of their Wing grows greater towards the Extremity, and forms a little round Mass under the Feathers, as big as a Musket Ball. That and its Beak are the chief Defence of this Bird. 'Tis very hard to catch it in the Woods, but easie in open Places, because we run faster than they, and sometimes we approach them without much Trouble. From March to September they are extremely fat, and taste admirably well, especially while they are young, some of the Males weigh forty-five Pounds.

Several of Leguat's observations were later confirmed through study of subfossil Rodrigues Solitaire remains. The curved contour lines of the pelvis also support the roundness of its hind parts, which he compared to that of a horse. Also, a ridged surface appears at the base of the beak (indicating the position of the caruncular ridge, which Leguat described as a "widow's peak"). Before fossils of the wrist-knob were found, Strickland noted that the keel of the sternum of the Rodrigues Solitaire was so well-developed as to almost indicate it had possessed the power of flight; however, since the humerus was very short he inferred that this was instead related to Leguat's claim that they used their wings for defence.[8]

Leguat continued with an elaborate description of the female Rodrigues Solitaire, which also appears to be the sex depicted in his illustration of the bird:

The Females are wonderfully beautiful, some fair, some brown; I call them fair, because they are the colour of fair Hair. They have a sort of Peak, like a Widow's upon their Breasts [beaks], which is of a dun colour. No one Feather is straggling from the other all over their Bodies, they being very careful to adjust themselves, and make them all even with their Beaks. The Feathers on their Thighs are round like Shells at the end, and being there very thick, have an agreeable effect. They have two Risings on their Craws [crop] and the Feathers are whiter than the rest, which livelily represents the fine neck of a Beautiful Woman. They walk with so much Stateliness and good Grace, that one cannot help admiring them and loving them; by which means their fine Mein often saves their Lives.

It has been proposed that Leguat's comparison between the crop of the female Rodrigues Solitaire and the "beautiful bosom of a woman" (changed to "fine neck" in some editions of his memoirs) was out of longing for female companionship.

Another description of its appearance and behaviour is found in an anonymous document rediscovered in 1874 called *Relation de l'Ile Rodrigue*, which has been attributed to Julien Tafforet, who was marooned on Rodrigues in 1726:

The solitaire is a large bird, which weighs about forty or fifty pounds. They have a very big head, with a sort of frontlet, as if of black velvet. Their feathers are neither feathers nor fur; they are of light grey colour, with a little black on their backs. Strutting proudly about, either alone or in pairs, they preen their plumage or fur with their beak, and keep themselves very clean. They have their toes furnished with hard scales, and run with quickness, mostly among the rocks, where a man, however agile, can hardly catch them. They have a very short beak, of about an inch in length, which is sharp. They, nevertheless, do not attempt to hurt anyone, except when they find someone before them, and, when hardly pressed, try to bite him. They have a small stump of a wing, which has a sort of bullet at its extremity, and serves as a defence.

[edit] Behaviour and ecology

Observations of the Rodrigues Solitaire indicate that they were highly territorial. They presumably settled disputes by striking each other with their wings; to aid this purpose, they used the knobs on their wrists.[25] It has been suggested that the knobs may have been formed through continuous injuries,

as they resemble diseased bone. Fractures in their wing bones also indicate that they were used in combat. It has also been suggested that these fractures may have been the result of a hereditary bone disease rather than battle-injuries. Some evidence (including their 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. Several accounts state that they defended themselves with a powerful bite. The species may have lived primarily in the island's woodlands, rather than on the shores. Pierre-Andr  guerty, writing about his time on the island around 1735, stated that a captive Rodrigues Solitaire (which he described as having a melancholic appearance) would always walk in the same line until running out of space, and then return back.

Many other of the endemic species of Rodrigues became extinct after the arrival of man, so the ecosystem of the island is heavily damaged. Before humans arrived, forests covered the island entirely, but very little remains today due to deforestation. The Rodrigues Solitaire lived alongside other recently extinct birds such as the Rodrigues Rail, the Rodrigues Parrot, Newton's Parakeet, the Rodrigues Starling, the Rodrigues Owl, the Rodrigues Night Heron, and the Rodrigues Pigeon. Extinct reptiles include the Domed Rodrigues giant tortoise, the Saddle-backed Rodrigues giant tortoise, and the Rodrigues day gecko.

Leguat stated that the Rodrigues Solitaire fed on dates, whereas Tafforet mentioned seeds and leaves. No other accounts mention diet. It has been suggested it ate latan palm fruits, for which it competed with the now-extinct *Cylindraspis* tortoises. It is not known how the young were fed, but related pigeons provide crop milk. The risings on the crop of the female may have covered glands that produced the crop milk. If the theory is correct, the birds may have practiced a division of labour, where the female stayed and fed the young crop milk, while the male collected food in the crop and delivered it to the female. It has been suggested that the maximum size attained by the Solitaire and the Dodo was limited by the amount of crop milk they were able to produce for their young during early growth.

Several contemporary accounts state that the Rodrigues Solitaire used gizzard stones. Dodos also did this, which may imply a similar diet. Leguat described the stones in the following passage, mentioning that Rodrigues Solitaires refused to feed in captivity:

Tho' these Birds will sometimes very familiarly come up near enough to one, when we do not run after them, yet they will never grow Tame. As soon as they are caught they shed Tears without Crying, and refuse all sustenance till they die.

We find in the Gizzards of both Male and Female, a brown Stone, of the bigness of a Hen's Egg, 'tis somewhat rough, flat on one side and round on the other, heavy and hard. We believe this Stone was there when they were hatched, for let them be never so young, you meet with it always. They never have but one of 'em, and besides, the Passage from the Craw to the Gizard is so narrow, that a like Mass of half Bigness cou'd not pass. It serv'd to whet our Knives better than any other Stone Whatsoever.

In 1877 three stones were found in a cavern on Rodrigues, each near a Rodrigues Solitaire skeleton, and were inferred to be the gizzard stones mentioned by Leguat. One of the stones was examined and found to be dolerite: somewhat rough, hard and heavy, ca. 50 g. (1 3/4 oz.), but hardly flat on one side as described by Leguat. This could be due to its association with a young individual. Although Leguat asserted that the bird hatched with the gizzard stone already inside, in reality adults most likely fed the stones to their hatchlings.

[edit] Reproduction

The most detailed account of the reproductive habits of the Rodrigues Solitaire is Leguat's. He described mating and nesting as follows:

When these Birds build their Nests, they choose a clean Place, gather together some Palm-Leaves for that purpose, and heap them up a foot and a half high from the Ground, on which they sit. They never lay but one Egg, which is much bigger than that of a Goose. The Male and Female both cover it in their turns, and the young is not hatch'd till at seven Weeks' end: All the while they are sitting upon it, or are bringing up their young one, which is not able to provide itself in several Months, they will not suffer any other Bird of their Species to come within two hundred Yards round of the Place; But what is very singular, is, the Males will never drive away the Females, only when he perceives one he makes a noise with his Wings to call to the Female, and she drives the unwelcome Stranger away, not leaving it till 'tis without her Bounds. The Female do's the same as to the Males, whom she leaves to the Male, and he drives them away. We have observ'd this several Times, and I affirm it to be true.

The Combats between them on this occasion last sometimes pretty long, because the Stranger only turns about, and do's not fly directly from the Nest. However, the others do not forsake it till they have quite driven it out of their Limits. After these Birds have rais'd their young One, and left it to itself, they are always together, which the other Birds are not, and tho' they happen to mingle with other Birds of the same Species, these two Companions never disunite. We have often remark'd, that some Days after the young leaves the Nest, a Company of thirty or forty brings another young one to it, and the now fledg'd Bird, with its Father and Mother joyning with the Band, march to some bye Place. We frequently follow'd them, and found that afterwards the old ones went each their way alone, or in Couples, and left the two young ones together, which we call'd a Marriage.

The clutch was described as consisting of a single egg; given the bird's large size, this led to proposals that the Solitaire was K-selected, which means it produced a low number of altricial offspring, which required extensive parental care until maturity. The gathering of unrelated juveniles suggests that they formed crÃ"ches, that may have followed foraging adults as part of the learning process.

The size difference between sexes has led to the suggestion that the Rodrigues Solitaire was not monogamous as stated by Leguat, and that this deeply-religious man attributed the trait to the bird for moral reasons. It has been proposed that it was instead polygynous, and the wing-rattling behaviour described for males suggests lek-mating, where males gather for competitive mating display. However, size dimorphism does occur in some monogamous birds; most other pigeons are monogamous as well.

Tafforet's account of aggressive behaviour confirms Leguat's description, adding that Rodrigues Solitaires would even attack humans approaching their chicks:

They do not fly at all, having no feathers to their wings, but they flap them, and make a great noise with their wings when angry, and the noise is something like thunder in the distance. They only ly, as I am led to suppose, but once in the year, and only one egg. Not that I have seen their eggs, for I have not been able to discover where they lay. But I have never seen but one little one alone with them, and, if any one tried to approach it, they would bite him very severely. These birds live on seeds and leaves of trees, which they pick up on the ground. They have a gizzard larger than the fist, and what is surprising is that there is found in it a stone of the size of a henn's egg, of oval shape, a little flattened, although this animal cannot swallow anything larger than a small cherry-stone. I have eaten them: they are tolerably well tasted.

[edit] Relationship with humans

Hans Hendricksz Bouwer was the first to list "Dodos", most likely referring to the Rodrigues Solitaire, as part of the fauna of Rodrigues in 1601. Sir Thomas

Herbert mentioned "Dodos" on Rodrigues again in 1634, and they were also mentioned in 1700.

The next account, which was the first referring to the bird as the "Solitaire", was published in François Leguat's 1708 memoir, *A New Voyage to the East Indies*. Leguat was the leader of a group of nine French Huguenot refugees, who were the first to colonise the island (from 1691 to 1693) after they were abandoned there by their captain. His description of the Rodrigues Solitaire and its behaviour is the most detailed account of the bird in life, and he also described other species that are now extinct. Leguat's observations are considered some of the first cohesive accounts of animal behaviour in the wild. He later left for Mauritius, but was too late to observe Dodos there. The Huguenots praised the Rodrigues Solitaires for their flavour, especially that of the young, and used their gizzard stones as knife sharpeners. D'Hŕguerty later claimed these were also useful in medicine, and referred to them as bezoars.

Many old accounts mention that Rodrigues Solitaires were hunted by man. Writing in 1735, Gennes de la Chanceliŕre described the capture and consumption of two specimens as follows:

Our men told of having seen goats and a large quantity of birds of different kinds: they brought, amongst others, two of which were bigger by a third than the largest turkey; they appeared, nevertheless to be still quite young, still having down on the neck and head; their wingtips were but sparsely feathered, without any proper tail. Three sailors told me of having seen two others, of the same species, as big as the biggest ostrich. The young ones that were brought had the head made more or less like the latter animal, but their feet were similar to those of turkeys, instead of that of the ostrich which is forked and cloven in the shape of a hind's foot. These two birds, when skinned, had an inch of fat on the body. One was made into a pie, which turned out to be so tough that it was uneatable.

Japetus Steenstrup noted that some Rodrigues Solitaire remains bore traces of having been broken by man (or perhaps another large predator) to extract bone marrow.

Unlike the Dodo, no Rodrigues Solitaires are known to have been sent to Europe alive. However, it has been claimed that Bertrand-Franŕois Mahŕ de La Bourdonnais sent a "Solitaire" to France from the nearby island of Rŕunion around 1740. Since the Rŕunion Solitaire is believed to have gone extinct by this date, the bird may actually have been a Rodrigues Solitaire.

[edit] Extinction

In 1755, Joseph-Franŕois Charpentier de Cossigny attempted to obtain a live specimen, as he had been assured the Rodrigues Solitaire still survived in remote areas of the island. Though trying for 18 months, and offering large rewards, none could be found. He noted that cats were blamed for decimating the species, but suspected that it was due to hunting by humans instead.

The Rodrigues Solitaire probably became extinct sometime between the 1730s and 1760s; the exact date is unknown. Its disappearance coincided with the tortoise trade between 1730 and 1750; traders burnt off vegetation, hunted Solitaires and imported cats and pigs that preyed on eggs and chicks.

Alexandre Guy Pingrŕ did not encounter any Solitaires when he visited Rodrigues to observe the 1761 transit of Venus, although he had been assured they survived. His friend, Pierre Charles Le Monnier, named a constellation, *Turdus Solitarius*, after the bird to commemorate the journey. Although the Rodrigues Solitaire is the only extinct bird to have a former constellation named for it, celestial mapmakers did not know what it looked like and star maps depict other birds.

Some later scholars doubted Leguat's story, and the existence of the Rodrigues Solitaire. In 1789, subfossil Rodrigues Solitaire bones encrusted in stalagmite were discovered in a cave and sent to Georges Cuvier about 1830. For unknown reasons, he stated they had recently been found on Mauritius, which caused

confusion, until they were compared with other bones from Rodrigues that were found to belong to the same species.[8] Subfossils were also recovered during the 1860s, but more complete remains were found during the 1874 transit of Venus, since an observation station was located on the island. Many of these excavations were requested by brothers Alfred and Edward Newton, who used them to describe the osteology of the bird in detail. Thousands of bones were excavated, and mounted skeletons were composed from the remains of several specimens. It has been suggested that the skeleton of this species is the best described after that of humans. These finds confirmed Leguat's descriptions, but at this time no living residents of Rodrigues remembered having seen live specimens. In 1831, a man who had lived on Rodrigues for 40 years stated he had never seen birds large enough to be Rodrigues Solitaires. Rodrigues covers only 104 square kilometres (40 sq mi), making it implausible that the bird would have survived undetected.

[edit] See also

^ The Oxford English Dictionary gives a meaning of frontlet that is used in ornithology as the margin just behind the beak and provides a quote of it being used in this way in 1874.

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South of Heaven is the fourth studio album by American thrash metal band Slayer. Released on July 5, 1988, the album was the band's second collaboration with record producer Rick Rubin, whose production skills on Slayer's previous album *Reign in Blood* had helped the band's sound evolve.

South of Heaven was Slayer's second album to enter the *Billboard* 200, and its last to be released by Def Jam Recordings, although the album became an American Recordings album after Rick Rubin ended his partnership with Russell Simmons. It was one of only two Def Jam titles to be distributed by Geffen Records through Warner Bros. Records because of original distributor Columbia Records's refusal to release work by the band. The release peaked at number 57 and in 1992 was awarded a gold certification by the Recording Industry Association of America.

In order to offset the pace of the group's previous album, Slayer deliberately slowed down the album's tempo. In contrast to their previous albums, the band utilized undistorted guitars and toned-down vocals. While some critics praised this musical change, others were more accustomed to the style of earlier releases were disappointed. Despite this, the songs "Mandatory Suicide" and the title track became permanent features of the band's live setlist.

[edit] Background

South of Heaven was recorded in Los Angeles, California with *Reign in Blood* producer Rick Rubin. PopMatters reviewer Adrien Begrand observed that Rubin's production "shoves [Dave] Lombardo's drumming right up front in the mix." [1] Guitarist Jeff Hanneman has since said that South of Heaven was the only album the band members discussed before writing the music. Aware that they "couldn't top *Reign in Blood*", and that whatever they recorded would be "compared to that album", he believed they "had to slow down", something Slayer had never done on albums before, or since. [2] Guitarist Kerry King cited the need to "keep people guessing" as another reason for the musical shift. [3] "In order to contrast the aggressive assault put forth on *Reign in Blood*, Slayer consciously slowed down the tempo of the album as a whole", according to Slayer's official biography. "They also added elements like undistorted guitars and toned-down vocal styles not heard on previous albums." [4]

This was also the first album where bassist/vocalist Tom Araya played his bass with a pick (rather than with his fingers), and it still continues to be this way even in present time. King has since been critical of his performance, which he describes as his "most lackluster." King attributes this to the fact he had recently married, and moved to Phoenix, Arizona. Describing himself as "probably the odd man out at that point", he admitted he "didn't participate as much because of that." Hanneman said: "We go through dry spells sometimes, but the good thing about having two guitar players that can write music is that you are never gonna go without. I guess at that time, Kerry was hitting a dry spell." King has also been critical of the album in general, describing it as one of his least favorite Slayer albums. He feels vocalist Tom Araya moved too far away from his regular vocal style, and "added too much singing." [2] Drummer Dave Lombardo has since observed: "There was fire on all the records, but it started dimming when South of Heaven came into the picture. And that's me personally. Again, I was probably wanting something else." [5]

Judas Priest's "Dissident Aggressor" is the only cover version to appear on a Slayer studio album. The song was chosen due to its war-themed lyrics. Hanneman described the track as "more just like one of those odd songs that a lot of people didn't know, but it was a favorite of Kerry and I, so we just picked that one." [6] Meanwhile, "Cleanse the Soul" has been heavily criticized by King who said that he hates the track: "That's one of the black marks in our history, in my book. I just fucking think it's horrible. [Laughs] I hate the opening riff. It's what we call a 'happy riff.' It's just like 'la-lala-la-la-la.' I can't see myself playing it, but after that, where it gets heavier, I like that section. If we ever did a medley, I'd put part of that in there." [7]

The Slayer boxset *Soundtrack to the Apocalypse* featured, along with four songs

of the album, an early version of the title track, recorded at Hanneman's home.[8]

[edit] Photography and illustration

Artist Larry Carroll and Illustrator Howard Schwartzberg designed the cover artwork for South of Heaven, having designed the artwork for Slayer's previous album Reign in Blood.[2] Photographer Glen E. Friedman took the promotional shot which surfaced as the back cover of South of Heaven around the time of 1986's Reign in Blood. Lombardo felt it made Slayer seem as though they "had matured a little bit", while Friedman himself deemed it "a really cool back cover" and "one of the most classic shots of them [Slayer] ever."[2]

[edit] Critical reception

South of Heaven was released on July 5, 1988, and was the final Slayer album distributed via Def Jam Records. When label co-founders Russell Simmons and Rubin parted ways, Slayer signed to Rubin's newly founded Def American Recordings label.[9] The album peaked at number 57 on the Billboard 200 album chart,[13] and on November 20, 1992, became Slayer's second album to be certified gold in the United States.[14] South of Heaven was awarded silver certification in the United Kingdom on January 1, 1993, Slayer's first record to do so in that country.[15]

Slayer's official biography states that "some critics praised the album as demonstrating Slayer's desire to grow musically and avoid repeating themselves." [4] Alex Henderson of AllMusic described the record as "disturbing and powerful," [9] while Joe Matera of Ultimate Guitar deemed the album a slight departure; he wrote that while the pace was slowed down, it "didn't sacrifice any of the heaviness inherent in Slayer's music." [3]

Reviewing the 2003 Slayer box set Soundtrack to the Apocalypse, Adrien Begrand of PopMatters described the album as "their most underrated, and on this set, its five selections show how highly the band thinks of the record." [1] KNAAC.com's Peter Atkinson was also positive, saying the album has a "grandiosity and imposing presence" which makes the record "so magnificent." [16] Grave's Ola Lindgren and Bolt Thrower's Karl Willetts both rate South of Heaven as amongst the top five albums of all time, [17] [18] while Max Kolesne of Brazilian death metal group Krisiun remembers hearing the song "Silent Scream" for the first time: "It just blew me away. It was like fast double-bass, fast kicks during the whole song. That was very inspiring for me." [19] When discussing Slayer in an October 2007 interview, Evile frontman Matt Drake stated that while Reign in Blood "was just speed", South of Heaven proved that the group could write "slow material as well." [20]

However, Kim Neely of Rolling Stone dismissed the album as "genuinely offensive satanic drivel." [11] Slayer's official biography states: "The new sounds disappointed some of the band's fans who were more accustomed to the style of earlier releases." [2] Michael Roberts of Westworld Online said this was due to some of the numbers moving "at the sludgier speed of Black Sabbath." [21] Araya commented that the "album was a late bloomerâ ~it wasn't really received well, but it kind of grew on everybody later." [2]

[edit] Cover versions

The title track and the song "Mandatory Suicide" have received various cover interpretations, particularly on Slayer tribute albums. Toni Ferguson recorded string quartet adaptations of both tracks on the album The String Quartet Tribute to Slayer: The Evil You Dread, with the former cover being described as having "menacing chord shifts" by Allmusic's Johnny Loftus. [22]

1995 Slayer tribute album Slatanic Slaughter featured three tracks which originally appeared on South of Heaven, with the title track, "Mandatory Suicide" and "Spill the Blood" interpreted by Cemetary, Crown of Thorns and Grope respectively. [23] Its 1998 follow up Slatanic Slaughter, Vol. 2 only featured two tracks originally from the album; namely "Silent Scream" arranged by Vader and "Read Between the Lies" interpreted by Anathema. [24] 1999's Straight to Hell: A Tribute to Slayer collected four Slayer renditions which originated on the album, with versions of South of Heaven performed by Abaddon (Venom) and Electric Hellfire Club, "Mandatory Suicide" cut by Chapter 7 and

"Behind the Crooked Cross" adapted by Gigantor.[25] 2006 Argentine tribute album *Al Sur Del Abismo* (Tributo Argentino A Slayer) saw Nafak and Climatic Terra also respectively cover "South of Heaven" and "Mandatory Suicide".[26] Hatebreed covered the song "Ghosts of War" for their 2009 cover album *For the Lions*. They released a music video for it also. Korn has covered the title track at least twice live, once with Kid Rock on vocals and another using the intro to follow into one of their songs live.

The title track itself has also been covered by Integrity 2000,[27] Modest Mouse and Califone,[28] Pro-Pain,[29] and Universe Eye.[30] Children of Bodom has covered *Silent Scream*. It appears on the UK version of the album *Hate Crew Deathroll*. Polish death metal band *Decapitated* covered the song "Mandatory Suicide" on their first full-length album *Winds of Creation*. In 2003, "Silent Scream" was covered by Children of Bodom for their album *Hate Crew Deathroll*. [31]

[edit] Live performances

Two songs taken from the album ("Mandatory Suicide" and "South of Heaven") have become near constant fixtures in the band's live setlist,[4] notching up appearances on the following: the live DVDs *Live Intrusion*, [32] *War at the Warfield*, [33] *Still Reigning*, [34] *Soundtrack to the Apocalypse's* deluxe edition's bonus live disc, [35] and the live double album *Decade of Aggression*. [36] Lombardo guested with Finnish cellist group *Apocalyptica* on a live medley of the two tracks at 1998's *Headbanger's Heaven* festival in the Netherlands. [37] Adrien Begrand of *PopMatters* described "South of Heaven" as "an unorthodox set opener in theory", noting "the song went over like a megaton bomb detonating the place: dozens of inverted crosses projected behind the high drum riser, the sinewy opening notes kicked in, followed by an overture of bass, cymbal crashes, and tom fills, leading up to the slowly building crescendo" in a concert review. [38] Lombardo remembers listening to a live rendition of "South of Heaven" and thinking "â "Man! There's just so much groove in that song.â To my kids I was saying, â "Listen to that! Listen to how groovy that is!â And it's heavy." [5] A rare live version of the track featured on the *JÃ GERMUSIC Rarities* 2004 promotional CD, given away to attendees at the Spring 2004 *JÃgermeister Music Tour*. [39] A live rendition of "South of Heaven" was also included on a bonus DVD which came with the group's 2007 re-release of ninth studio album *Christ Illusion*, shot in Vancouver, British Columbia during 2006's *Unholy Alliance* tour. [40]

"Behind the Crooked Cross" is rarely played live as Hanneman hates the track, though King has always wanted to play it "because it's got a cool intro" despite it not being his favorite song. King said "that's fine" when speaking of the situation, noting "there are songs that he wants to play that I always shoot down." [2] "Ghosts of War" isn't King's favorite song either, which he attests "everybody always wants to hear" performed live. He confessed; "I like the ending, you know, I like the big heavy part and I always say, â "Let's put the heavy ending at the end of "Chemical Warfare" and just do the last half.â But I could never make that fly." [41]

Slayer has toyed with the idea of creating a live set mixed with selections from the album and 1990's *Seasons in the Abyss*, though Hanneman has said it's something which hasn't been "seriously considered." [42] *Metal Maniacs* asked Slayer in a 2006 interview whether they would consider playing *South of Heaven* in the footsteps of the *Still Reigning* tour, to which Araya replied, "It's becoming a trendy thing now. I don't know. We have some really cool albums, but I don't think we'll ever do that again." King was equally unsure, commenting, "Probably not. And I just don't like enough songs off *South of Heaven*." [7]

[edit] Track listing

1.  
"South of Heaven" Â  
Tom Araya  
Jeff Hanneman  
4:58
- 2.

"Silent Scream" Â  
 Araya  
 Hanneman, Kerry King  
 3:07  
 3.  
 "Live Undead" Â  
 King, Araya  
 Hanneman  
 3:50  
 4.  
 "Behind the Crooked Cross" Â  
 Hanneman  
 Hanneman  
 3:15  
 5.  
 "Mandatory Suicide" Â  
 Araya  
 Hanneman, King  
 4:05  
 6.  
 "Ghosts of War" Â  
 King  
 Hanneman, King  
 3:53  
 7.  
 "Read Between the Lies" Â  
 King, Araya  
 Hanneman  
 3:20  
 8.  
 "Cleanse the Soul" Â  
 King, Araya  
 Hanneman  
 3:02  
 9.  
 "Dissident Aggressor" (Judas Priest cover)  
 Rob Halford  
 K.K. Downing, Glenn Tipton  
 2:35  
 10.  
 "Spill the Blood" Â  
 Hanneman  
 Hanneman  
 4:49  
 [edit] Personnel  
 [edit] References

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"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 honors~including three Grammy Awards, one American Music Award, and a People's Choice Award~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 1984~1985 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 Rogers~Kragen's clients~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 La~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] LaToya 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 proportionsÂ ... 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 15Â bags of flour for 27,000Â 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 session of "We Are the World" on January 28, 1985.[17]

Each of the performers took his or her position at around 10:30Â 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 studioâ ~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 8Â 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 4× certification by the Recording Industry Association of America.[27][41] The estimated global sales of "We Are the World" are said to be 20 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 Pepsi—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 20Â 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 15,000Â 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 \$44.5Â 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 \$50Â million.[63] By October 1986, it was revealed that their \$50Â million target had been met and exceeded; CBS Records gave USA for Africa a check for \$2.5Â million, drawing the total amount of money to \$51.2Â million.[64] USA for Africa's Hands Across America event had also raised a significant amount of moneyâ ~approximately \$24.5Â million for the hungry in the US.[64]

Since its release, "We Are the World" has raised over \$63Â 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 10Â percent of funds was earmarked for domestic hunger and homeless programs in the US.[64][66] From the African fund, over 70Â 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 100Â 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 62 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 20th 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 4 ^ 18, 1985  
Succeeded by "Crazy for You" by Madonna

Preceded by "Nightshift" by Commodores  
Dutch number-one single  
April 20 ^ 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 5 ^ 19, 1985  
Succeeded by Chanteurs sans FrontiÃ¨res by Ã thiopie

Preceded by "Shout" by Tears for Fears (dated April 5, 1985)  
New Zealand number-one single  
April 19 ^ 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 5 ^ 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 8 ^ 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 20 ^ 27, 1985  
Succeeded by "Move Closer" by Phyllis Nelson



Preceded by "One More Night" by Phil Collins  
Billboard Hot 100 number-one single  
April 13 to 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 4 to 11, 1985  
Succeeded by "Fresh" by Kool & the Gang  
Preceded by "One More Night" by Phil Collins  
Billboard Adult Contemporary number-one single  
April 20 to 27, 1985  
Succeeded by "Rhythm of the Night" by DeBarge  
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[edit] External links

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Links to related articles

Hurricane Mitch was the most powerful hurricane and the most destructive of the 1998 Atlantic hurricane season, with maximum sustained winds of 180 mph (285 km/h). The storm was the thirteenth tropical storm, ninth hurricane, and third major hurricane of the season. Along with Hurricane Georges, Mitch was the most notable hurricane in the season. At the time, Hurricane Mitch was the strongest Atlantic hurricane observed in the month of October, though it has since been surpassed by Hurricane Wilma of the 2005 season. The hurricane matched the fourth most intense Atlantic hurricane on record (it has since dropped to seventh).

Mitch formed in the western Caribbean Sea on October 22, and after drifting through extremely favorable conditions, it rapidly strengthened to peak at Category 5 status, the highest possible rating on the Saffir–Simpson Hurricane Scale. After drifting southwestward and weakening, the hurricane hit Honduras as a minimal hurricane. It drifted through Central America, reformed in the Bay of Campeche, and ultimately struck Florida as a strong tropical storm.

Due to its slow motion from October 29 to November 3, Hurricane Mitch dropped historic amounts of rainfall in Honduras, Guatemala, and Nicaragua, with unofficial reports of up to 75 inches (1,900 mm). Deaths due to catastrophic flooding made it the second deadliest Atlantic hurricane in history; nearly 11,000 people were killed with over 11,000 left missing by the end of 1998. Additionally, roughly 2.7 million were left homeless as a result of the hurricane. The flooding caused extreme damage, estimated at over \$6 billion (1998 USD, \$8.56 billion 2013 USD).

[edit] Meteorological history

The origin of Hurricane Mitch can be traced to a tropical wave that moved off the coast of Africa on October 10. It moved westward across the shear-ridden Atlantic Ocean, and remained disorganized until entering the Caribbean Sea on October 18. Upon entering the western Caribbean Sea, convection steadily increased, and on October 22, the wave organized into Tropical Depression Thirteen while 415 mi (670 km) south of Kingston, Jamaica. Under weak steering currents, it drifted westward and intensified into a tropical storm on October 23 while 260 mi (420 km) east-southeast of San Andrés Island.[1]

Initially, intensification was limited due to an upper-level low causing vertical wind shear over Tropical Storm Mitch. As the storm executed a small loop to the north, the shear weakened, allowing the system to strengthen. Mitch attained hurricane status on October 24 while 295 mi (475 km) south of Jamaica, and with warm water temperatures and well-defined outflow, the hurricane rapidly strengthened. During a 48-hour period from October 23 to October 25, the central pressure dropped 52 mbar, and on October 26, Mitch reached peak intensity with 180 mph (290 km/h) winds and a pressure of 905 mbar, one of the lowest pressures ever recorded in an Atlantic hurricane.[1]

The hurricane moved westward, resulting in land interaction with Honduras. This weakened Mitch slightly, and after passing over the Swan Islands on October 27, the hurricane steadily weakened. The hurricane drifted southward along the Honduran coastline, and made landfall 80 mi (130 km) east of La Ceiba

in Honduras on October 29 as a Category 1 hurricane on the Saffir-Simpson Hurricane Scale with 80 mph (130 km/h) winds. It continued to weaken over land, drifting westward through Central America, and its low-level circulation dissipated on November 1 near the Guatemala-Mexico border.[1]

The remnant area of low pressure drifted northward into the Bay of Campeche, and reorganized on November 3 into a tropical storm while 150 mi (240 km) southwest of Mérida, Yucatán. Mitch moved to the northeast, making landfall on the Yucatán Peninsula near Campeche on November 4. It weakened to a tropical depression over land, but restrengthened to a tropical storm over the southeastern Gulf of Mexico. As Mitch accelerated to the northeast in association with a cold front, it gradually intensified, and made landfall near Naples, Florida on November 5 as a tropical storm with 65 mph (100 km/h) winds. Mitch became extratropical later that day, but it continued to persist for several days before losing its identity north of Great Britain on November 9.[1]

#### [edit] Preparations

Due to the threat, the government of Honduras evacuated some of the 45,000 citizens on the Bay Islands and prepared all air and naval resources. The government of Belize issued a red alert and asked for citizens on offshore islands to leave for the mainland.[3] Because the hurricane threatened to strike near Belize City as a Category 4 hurricane, much of the city was evacuated in fear of a repeat of Hurricane Hattie 37 years earlier.[4] Guatemala issued a red alert as well, recommending boats to stay in port, telling people to prepare or seek shelter, and warning of potential overflowed rivers.[3] By the time Mitch made landfall, numerous people were evacuated along the western Caribbean coastline, including 100,000 in Honduras, 10,000 in Guatemala, and 20,000 in the Mexican state of Quintana Roo.[5]

#### [edit] Impact

##### Impact by region

##### Region

##### Deaths

##### Ref

##### Damages

##### Ref

##### Belize

700111000000000000011

[4]

7004500000000000000\$50 thousand

[6]

##### Costa Rica

70007000000000000007

[4]

7007920000000000000\$92 million

[7]

##### El Salvador

7002240000000000000240

[8]

7008400000000000000\$400 million

[8]

##### Guatemala

7002268000000000000268

[9]

7008748000000000000\$748 million

[9]

##### Honduras

700414600000000000014,600

[6][10]

7009380000000000000\$3.8 billion

[11][6]

##### Jamaica



700030000000000000000003

[4]

Mexico

700090000000000000000009

[4][6]

7006100000000000000000\$1 million

[6]

Nicaragua

70033800000000000000003,800

[4]

7009100000000000000000\$1 billion

[4]

Panama

700030000000000000000003

[4][6]

7004500000000000000000\$50 thousand

[6]

United States

700020000000000000000002

[1]

7007400000000000000000\$40 million

[1]

Offshore

700131000000000000000031

[4]

5000000000000000000000

Total

70041897400000000000018,974

7009608110000000000000\$6.08 billion

Hurricane Mitch was the deadliest Atlantic hurricane since the Great Hurricane of 1780, displacing the Galveston Hurricane of 1900 as the second-deadliest on record. Nearly eleven thousand people were confirmed dead, and almost as many reported missing. Deaths were mostly from flooding and mudslides in Central America, where the slow-moving hurricane and then tropical storm dropped nearly 36 inches (900 mm) of rain. The flooding and mudslides damaged or destroyed tens of thousands of homes, with total damage amounting to over \$5 billion (1998 USD, \$6 billion 2006 USD), most of which was in Honduras and Nicaragua. Prior to Mitch, the deadliest hurricane in Central America was Hurricane Fifi in 1974, which killed an estimated 8,000 to 10,000.[1]

[edit] Honduras

Prior to hitting Honduras, Hurricane Mitch sent waves of up to 22 feet (6.7 m) in height to the coast. Upon making landfall, it diminished in intensity, but still caused a strong storm surge and waves of 12 feet (3.7 m) in height.[12] While the storm was drifting over the country, it dropped extreme rainfall peaking at nearly 36 inches (910 mm) in Choluteca, where over 18 inches (460 mm) of rain fell in one day.[1] The rainfall in Choluteca was equivalent to the average rainfall total in 212 days. The Choluteca River at this point flooded to six times its normal width. The widespread flooding was partially caused by Honduras' slash-and-burn agriculture, so the forests could not absorb any moisture.[13] In addition, there were estimates of as high as 75 inches (1,900 mm) in mountainous regions.[4] The rainfall collected in rivers, causing extensive river flooding across the country. The deepest average depth was 12.5 meters on the Ulúa River near Chinda, while the average widest length was 359 meters on the Río de la Paz near Arizona. The rainfall also caused widespread mudslides across the mountainous country.[14]

Mitch caused such massive and widespread damage that Honduran President Carlos Roberto Flores claimed it destroyed fifty years of progress in the country. An estimated 70 to 80% of the transportation infrastructure of the entire country was wiped out, including nearly all bridges and secondary roads; the damage was so great that existing maps were rendered obsolete.[4] About 25 small villages

were reported to have been entirely destroyed by the landslides caused by the storm.[4] Damages to the transportation and communication network totaled to \$529 million (1998 USD, \$718 million 2011 USD).[11] Across the country, the storm destroyed 33,000 houses and damaged 50,000 others. In addition, it downed numerous trees, leaving mountainsides bare and more vulnerable to mudslides.[15]

Mitch's rainfall resulted in severe crop losses in the country, affecting more than 300 square miles (800 km<sup>2</sup>) or 29% of the country's arable land. The NCDC estimated the flooding destroyed at least 70% of the country's crops.[4] Food crops were severely impacted, including destruction of 58% of the corn output, 24% of sorghum, 14% of rice, and 6% of the bean crop. Several important export crops faced similar losses, including 85% of banana, 60% of sugar cane, 29% of melons, 28% of African palms, and 18% of coffee. Crop damage alone was estimated anywhere from \$900 million (1998 USD, \$1.22 billion 2011 USD) to \$1.7 billion (1998 USD, \$2.31 billion 2011 USD). Large amounts of animal losses occurred as well, including the death of 50,000 cattle and the loss of 60% of the poultry population.[11] Shrimp production, which had become an important export, faced nearly complete destruction.[15] Total animal losses amounted to \$300 million (1998 USD, \$407 million 2011 USD).[11]

The extreme flooding and mudslides killed over 6,500, with several thousand missing. Many of the unidentified were buried in mass graves, resulting in great uncertainty over the final death toll. Over 20% of the country's population, possibly as many as 1.5 million people, were left homeless. The severe crop shortages left many villages on the brink of starvation, while lack of sanitation led to outbreaks of malaria, dengue fever, and cholera.[4]

On the offshore island of Guanaja, the hurricane spent three days stalling near the island. Strong winds destroyed one third of the island's houses and left most citizens without power for months. The island's two fish packing plants were damaged while two main resorts were closed. Guanaja received little help from the national government, being a small (9 miles long, 14 km) island which has traditionally had an independent and self-reliant streak. Instead, international aid arrived from former Guanaja citizens, enough that citizens from the mainland came to the island to acquire supplies.[16] In all, at least 7,000 were reported dead and damage was pegged at \$3.8 billion in Honduras.

[edit] Nicaragua

Though Mitch never entered Nicaragua, its large circulation caused extensive rainfall, with estimates of over 50 inches (1,300 mm).[4] In some places, as much as 25 inches (640 mm) of rain fell on coastal areas.[17] The flank of the Casita Volcano failed and turned into a lahar from excessive rain. The resulting mudslide ultimately covered an area 10 miles (16 km) long and 5 miles (8 km) wide.[4]

Two million people in Nicaragua were directly affected by the hurricane.[4] Across the country, Mitch's heavy rains damaged 17,600 houses and destroyed 23,900, displacing 368,300 of the population.[15] 340 schools and 90 health centers were severely damaged or destroyed. Sewage systems and the electricity subsector were severely damaged, and, combined with property, damage totaled to \$300 million (1998 USD, \$407 million 2011 USD).[18]

Transportation was greatly affected by the hurricane, as well. The rainfall left 70% of the roads unusable or destroyed and greatly damaged 92 bridges.[19] Over 1,700 miles (2700 km) of highways or access roads needed replacement subsequent to the storm, especially in the northern part of the country and along portions of the Pan-American Highway. Total transportation damage amounted to \$300 million (1998 USD, \$407 million 2011 USD). Agricultural losses were significant, including the deaths of 50,000 animals, mostly bovines. Crops and fisheries were affected greatly as well, and, combined with agricultural losses, damage totaled to \$185 million (1998 USD, \$251 million 2011 USD).[18]

The situation was further compounded by a total of 75,000 live land mines left over from the Contra insurgency of the 1980s that were calculated to have been uprooted and relocated by the floodwaters.[20]

In all, Hurricane Mitch caused at least 3,800 fatalities in Nicaragua, of

which more than 2,000 were killed in the towns of El Provenir and Rolando Rodriguez from the landslide at the Casita volcano. The mudslide buried at least four villages completely in several feet of mud. Throughout the entire country, the hurricane left between 500,000 and 800,000 homeless. In all, damage in Nicaragua is estimated at around \$1 billion (1998 USD, \$1.36 billion 2011 USD).[4]

[edit] Caribbean Sea

Mitch was also responsible for the loss of the Fantome windjammer sailing ship owned by Windjammer Barefoot Cruises; all 31 of the crew perished. The story was recorded in the book *The Ship and The Storm* by Jim Carrier. The ship, which was sailing near the center of the hurricane, experienced over 50 foot (15 m) waves and over 100 mph (160 km/h) winds, causing the Fantome to sink off the coast of Honduras.[21]

On the south coast of Cuba, the hurricane caused waves of up to 13 feet (4 m) high and winds gusts peaking at 42 mph (67 km/h), causing numerous tourists and workers on the Isle of Youth and Cayo Largo del Sur to leave for safer grounds.[22]

In Jamaica, where officials declared hurricane warnings 12 hours prior to its closest approach,[1] Mitch caused moderate rainfall and gusty winds for days. Strong waves hit western Jamaica, with wave heights unofficially estimated at nearly 7 feet (2 m) in height. The rainfall in outer rainbands, at times severe, flooded many roads across the island and left them covered with debris. One house in Spanish Town collapsed from the flooding, leaving four homeless. Many other homes and buildings were flooded, forcing many to evacuate. A river in northeastern Jamaica overflowed its banks, while heavy rainfall across the mountainous parts of the country caused numerous mudslides.[23] In all, Mitch killed three people on Jamaica.[4]

On the Cayman Islands, the hurricane caused strong waves, gusty winds, and heavy rainfall at times. Damage was relatively minimal, amounting to blown out windows and beach erosion. Strong waves damaged or destroyed many docks on the south shore of the islands, and also sank one dive ship near Grand Cayman. In addition, numerous incoming and outgoing flights were cancelled.[24]

[edit] Rest of Central America

Deadliest Atlantic hurricanes

Rank

Hurricane

Season

Fatalities

1

"Great Hurricane"

1780

22,000

2

Mitch

1998

19,325+

3

"Galveston"

1900

8,000 ~ 12,000

4

Fifi

1974

8,000 ~ 10,000

5

"Dominican Republic"

1930

2,000 ~ 8,000

6

Flora

1963  
7,186 â ^ 8,000  
7  
"Pointe-À -Pitre"  
1776  
6,000+  
8  
"Newfoundland"  
1775  
4,000 â ^ 4,163  
9  
"Okeechobee"  
1928  
4,075+  
10  
"Monterrey"  
1909  
4,000

See also: List of deadliest Atlantic hurricanes

Due to Mitch's large circulation, it dropped heavy precipitation as far south as Panama, especially in the DariÃn and ChiriquÃ provinces. The flooding washed away a few roads and bridges, and damaged numerous houses and schools, leaving thousands homeless.[25] The hurricane left three casualties in Panama.[4]

In Costa Rica, Mitch dropped heavy rains, causing flash flooding and mudslides across the country, mostly in the northeastern part of the country.[4] The storm impacted 2,135 homes to some degree, of which 241 were destroyed,[7] leaving 4,000 homeless.[17] Throughout the country, the rainfall and mudslides affected 126 bridges and 800Â miles (1300Â km) of roads, mostly on the Inter-American Highway which was affected by Hurricane Cesar, two years prior. Mitch affected 115 sq. miles (300Â km<sup>2</sup>) of crop lands, causing damage to both export and domestic crops. In all, Hurricane Mitch caused \$92Â million in damage (1998Â USD, \$124.9Â million 2011Â USD)[7] and seven deaths.[4]

While drifting through El Salvador, the hurricane dropped immense amounts of precipitation, resulting in flash flooding and mudslides through the country. Multiple rivers, including the Río Grande de San Miguel and the Lempa River overflowed, contributing to overall damage. The flooding damaged more than 10,000 houses, leaving around 84,000 homeless[8] and forcing 500,000 to evacuate.[26] Crop damage was severe, with serious flooding occurring on 386 sq. miles (1000Â km<sup>2</sup>) of pasture or crop land. The flooding destroyed 37% of the bean production, 19% of the corn production, and 20% losses in sugar canes. There were heavy losses in livestock as well, including the deaths of 10,000 cattle. Total agricultural and livestock damaged amounted to \$154Â million (1998Â USD, \$209Â million 2011Â USD). In addition, the flooding destroyed two bridges and damaged 1,200Â miles (2000Â km) of unpaved roads. In all, Mitch caused nearly \$400Â million in damage (1998Â USD, \$543Â million 2011Â USD) and 240 deaths.[8]

Similar to the rest of Central America, Mitch's heavy rains caused mudslides and severe flooding over Guatemala. The flooding destroyed 6,000 houses and damaged 20,000 others, displacing over 730,000 and forcing over 100,000 to evacuate. In addition, the flooding destroyed 27 schools and damaged 286 others, 175 severely. Flooding caused major damage to crops, while landslides destroyed crop land across the country. The most severely affected crops for domestic consumption were tomatoes, bananas, corn, other vegetables, and beans, with damaged totaling to \$48Â million (1998Â USD, \$65Â million 2011Â USD). Export crops such as bananas or coffee were greatly damaged as well, with damage amounting to \$325Â million (1998Â USD, \$441Â million 2011Â USD). Damage to plantations and soil totaled to \$121Â million (1998Â USD, \$164Â million 2011Â USD). The flooding also caused severe damage to the transportation infrastructure, including the loss of 37 bridges. Across the country, flooding damaged or destroyed 840Â miles (1350Â km) of roads, of which nearly 400Â miles (640Â km) were sections of major highways. In all, Hurricane Mitch caused \$748Â million (1998Â

USD, \$1.02 billion 2011 USD) and 268 deaths in Guatemala.[9] In addition, Mitch caused 11 indirect deaths when a plane crashed during the storm.[26]

In Belize, the hurricane was less severe than initially predicted, though Mitch still caused heavy rainfall across the country.[26] Numerous rivers exceeded their crests, though the rainfall was beneficial to trees in mountainous areas.[27] The flooding caused extensive crop damage and destroyed many roads. Throughout the country, eleven people died because of the hurricane.[26]

In Mexico, Mitch produced gusty winds and heavy rains on the Yucatán Peninsula, with Cancún on the Quintana Roo coast being the worst hit.[26] Nine people were killed from the flooding, though damage was relatively minimal.[4] The maximum 24-hour rainfall total from Mitch was 13.4 inches (340 mm) in Campeche,[28] while the highest rainfall total was 16.85 inches (428.0 mm) in Ciudad del Carmen.[29]

[edit] Florida

Then a tropical storm, Mitch caused a storm surge of up to four feet in the lower Florida Keys before making landfall on the Florida west coast. Key West International Airport reported peak wind gusts of 55 mph (89 km/h) and sustained winds of 40 mph (64 km/h), the only report of tropical storm force in the state.[1] Offshore, the Fowey Rocks Light reported a wind gusts of 73 mph (117 km/h).[30] In addition, Mitch caused moderate rainfall, peaking at 7 inches (200 mm) in Jupiter, though some estimates indicate localized totals of up to 10 inches (250 mm). The storm spawned five tornadoes over the state, the strongest of which was an F2.[1]

In the Florida Keys, multiple buildings that had been damaged by Hurricane Georges were leveled by Mitch.[4] Tornadoes from the storm damaged or destroyed 645 houses across the state, in addition to injuring 65 people.[1] Gusty winds left 100,000 without power during the storm's passage.[4] In all, Mitch caused \$40 million in damage (1998 USD, \$54.3 million 2011 USD) in Florida and two deaths from drowning when two boats capsized.[1]

[edit] Aftermath

Because of the hurricane's destruction in Central America and elsewhere in North America, the World Meteorological Organization retired the name Mitch in the spring of 1999; it will never again be used for an Atlantic hurricane. The name was replaced with Matthew in the 2004 season.

After the disaster caused by Hurricane Mitch, countries around the world donated significant aid, totaling \$6.3 billion (1998 USD, \$8.6 billion 2011 USD). Throughout Central America, which was recovering from an economic crisis that occurred in 1996, many wished to continue the growth of the infrastructure and economy. In addition, after witnessing the vulnerability to hurricanes, the affected governments endeavored to prevent such a disaster from occurring again.[13]

Hundreds of thousands of people lost their homes, but many took this as an opportunity to rebuild stronger houses. With a new, structurally improved foundation, homes were redesigned to be able to withstand another hurricane. However, lack of arable crop land took away the jobs from many, decreasing an already low income even lower.[31]

Following the passage of Mitch, disease outbreaks occurred throughout Central America, including cholera, leptospirosis, and dengue fever. Over 2,328 cases of cholera were reported, killing 34 people. Guatemala was most affected by the bacterium, where most of the deaths occurred from contaminated food. 450 cases of leptospirosis were reported in Nicaragua, killing seven people. There were over 1,357 cases of dengue reported, though no deaths were reported from the disease.[32]

While stalling over the western Caribbean Sea, Mitch's strong winds produced strong waves, damaging local coral reefs. Later, the storm's immense rainfall led to runoff polluted with debris and fresh water. This resulted in diseases occurring within the coral. However, the hurricane's upwelling cooled the warm water temperatures, preventing significant bleaching and destruction of the coral reef.[33]

Honduras, the country most affected by the hurricane, received significant aid for the millions impacted by the hurricane. Mexico quickly gave help, sending 700 tons of food, 11 tons of medicine, four rescue planes, rescue personnel, and trained search dogs. Cuba also volunteered, sending a contingent of physicians to the country.[34] The U.S. administration offered at first troops stationed in Honduras, and then withdrew them a few days after the storm. They also at first offered only \$2 million (1998 USD, \$2.7 million 2011 USD) in aid, which came as a shock to residents, and president Carlos Roberto Flores alike. The U.S. later increased their offer to \$70 million (1998 USD, \$95 million 2011 USD).[35] The Honduran government distributed food, water, and medical services to the hurricane victims, including the more than 4 million without water.[13] President Flores turned the administration of the relief efforts to the church, both Protestant and Catholic. The relief effort was carried out with virtually no incidents; only one truck was discovered to be re-routed for personal use, and the person responsible for this was subsequently punished. In addition, the country initially experienced a sharp increase in the unemployment rate, largely due to the destruction of crop lands. However, rebuilding provided jobs in the following years.[11] In Costa Rica, reconstruction after the hurricane increased the number of jobs by 5.9%, lowering the unemployment rate slightly.[7]

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[edit] External links

*Geastrum quadrifidum*, commonly known as the rayed earthstar or four-footed earthstar, is an inedible species of mushroom belonging to the genus *Geastrum*, or earthstar fungi. First described scientifically by Christian Hendrik Persoon in 1794, *G. quadrifidum* is a cosmopolitan ~but not common~ species of Europe, the Americas, Africa, Asia, and Australasia. The fungus is a saprobe, feeding off decomposing organic matter present in the soil and litter of coniferous forests.

The small, tough, fruit bodies are grayish-brown balls that are initially enclosed by a skin, or peridium, made up of four distinct layers of tissue. The outer tissue layer splits to form star-like rays and expose a circular spore case. Inside the spore case is the gleba ~fertile spore-producing tissue that is white and firm when young, but becomes brown and powdery in age. The grayish-brown spore case is set on a short, slender stalk, and has a well-defined narrow pore at the top where mature spores may escape. Fully expanded, the fruit body reaches dimensions up to 2–3 cm (0.8–1.2 in) wide and up to about 3 cm (1.2 in) tall. The outer skin is purplish-brown, with four or five cream or yellowish-brown colored rays that have their tips stuck in the substrate. There is a flat mat of interwoven mycelia between ray tips. The spores are spherical, warty, and have a diameter of up to 6 µm. *Geastrum quadrifidum* is one of a number of earthstars whose rays arch downward as they mature, lifting the spore sac upward, high enough to catch air currents that disseminate the spores into new habitats. The species is easily confused with *Geastrum fornicatum*, a larger earthstar without a well-defined pore mouth.

[edit] Taxonomy and naming

The Dutch mycologist Christian Hendrik Persoon published the first official description of *Geastrum quadrifidum* in 1794,[3] and later sanctioned this name in his 1801 *Synopsis Methodica Fungorum* (as *Geastrum quadrifidum* var. *minus*, a variety now considered synonymous with *G. quadrifidum*).[4] Although the species had been previously described as *Lycoperdon coronatum* by Jacob Christian Schaeffer (1763) and Giovanni Antonio Scopoli (1772),[5] then afterward as *Geaster coronatus* by Joseph Schröter (1889),[6] the epithet *coronatus* is not to be used because of the existence of the sanctioned name.[8]

In Japan, *G. quadrifidum* has occasionally been called "*Geastrum minus*" (Pers.) G. Cunn. (for example, as in Imai, 1936);[9] within taxonomical terminology, this usage is an *auctorum non* ~a misapplication or misinterpretation of the species name.[10]

According to Stanek's classification of the genus *Geastrum*,[11] (a classification later endorsed in Sunhede's 1989 monograph of European *Geastrum* species), *G. quadrifidum* belongs in the subsection *Glabrostoma* of the section *Perimyceliata*, a grouping of similar *Geastrum* species that incorporate and encrust debris in the mycelial layer, and have an even peristome (opening) that



is fibrillose (made of more or less parallel thin thread-like filaments). Several common names for *G. quadrifidum* have been suggested, including "rayed earthstar", [12] "four-pointed earthstar" [13] and "four-footed earthstar". [14] Samuel Frederick Gray called it the "four-cut shell-puff" in his 1821 *The Natural Arrangement of British Plants*, [15] but the name was not adopted by subsequent authors. The specific epithet *quadrifidum* is derived from Latin, and means "four-forks". [16]

[edit] Description

As in all *Geastrum* fungi, the internal spore-producing gleba is enclosed in the peridium, a protective structure composed of four layers of tissue: an inner endoperidium, and outer exoperidium that may further be divided into an external mycelial, a tough and membranous middle fibrillose layer, and an internal fleshy layer (known as the pseudoparenchyma). [17] The immature, unopened fruit body is roughly spherical to somewhat flattened or irregular in shape. It lies partly or wholly submerged, encrusted with debris. The expanded fruit body is usually taller than it is wide, about 10–40 mm (0.4–1.6 in) high, with mycelial cup included about 15–55 mm (0.6–2.2 in). The exoperidium (the outer tissue layer of the four-layered peridium) splits in the middle into three to six, but usually four or five rays. The exoperidium is typically fornicate—a structural feature that arises when the mesoperidium separates from the exoperidium, adhering only at the edge. In this way, the endoperidium (the internal tissue layer that encloses the spore sac) is lifted upwards with the downward movement of the rays. In this species, the tips of the rays remain attached to the mycelial layer, which remain attached to the substrate as a cup in the ground. [18]

Fresh fruit bodies have a fleshy white to cream-colored exoperidium. This individual has a pseudoparenchymatous collar, the thickness of which hides the short stalk that supports the spore sac.

When the pseudoparenchymatous layer dries it shrinks and hardens, darkening to brown; the structure is maintained by the underlying stiff papery fibrous layer.

Unlike those of some other *Geastrum* species, the rays of *G. quadrifidum* are not hygroscopic: they do not open and close in response to changes in humidity. Generally, the rays are broad, but they may seem narrow as their edges are often rolled inwards. The width of the exoperidium (when still attached to the mycelial cup) is 8–25 mm (0.3–1.0 in), when fully expanded about 15–90 mm (0.6–3.5 in). The pseudoparenchymatous layer when fresh is about 1–2 mm thick, initially whitish, later turning beige to brownish (sometimes over reddish tints), and dark brown when old. In newly expanded specimens this layer is covered with a thin layer of crystals and hyphae, sometimes forming a pseudoparenchymatous cup or collar that often peels off in patches, when dry shrunken and hard. The fibrous layer is papery to leathery. The inner side, when free from pseudoparenchymatous remnants, is almost white, in age becoming dirty grayish-white and sometimes greenish due to algae; the outer side is initially whitish, somewhat glossy, but in age becomes grayish-white and dull. The mycelial layer has a whitish inner side and is strongly attached to the litter on its outer side. It persists for a long time (1–2-year-old fruit bodies with intact mycelial cups have been found). [18]

The spore sac is variable in shape, ranging from roughly spherical to egg-shaped or irregular, but it is usually taller than it is wide. Its diameter ranges between 3.5 and 16 mm (0.14 and 0.63 in), although it is most commonly between 5 and 10 mm (0.2 and 0.4 in). An apophysis (a swelling on the underside

of the spore sac) is often present. The stalk is visible when the pseudoparenchymatous layer has dried up, and is short but distinct, measuring 1.5–2.5 mm tall. The color is variable; in dry specimens it is whitish, light beige, beige gray, smoky gray or brownish-gray. The endoperidium in newly expanded fruit bodies is pruinose: covered with a light beige to whitish powder of hyphae and crystalline matter. This powder gradually disappears as the fruit body ages. Its color is highly variable, and both light and dark endoperidia are present. The peristome (a clearly demarcated region encircling the opening of the spore sac) is distinctly delimited, with a disc-like to more or less conical shape.[18] It is lighter in color than the spore sac, and up to 2 mm high.[19] In old specimens, the hyphae around the peristome sometimes stick together to develop radial grooves. The color is variable, but often of grayish or grayish-brown tints, often lighter than the endoperidium. The columella (sterile tissue, usually originating in the base of the gleba, extending into or through the gleba) is rather weak, more or less columnar to club-shaped, emerging from a more or less bulge-like continuation of the stalk and intruding to about the half or more into the mature gleba. The mature gleba is dark brown.[18] *G. quadrifidum* is inedible.[16]

#### [edit] Microscopic characteristics

The basidia of *G. quadrifidum* have a basal clamp connection, or they narrow into a hyphal part that ends at a clamp. When they are young, they are more or less ellipsoid to club-shaped, but in age they often become more or less bottle-shaped, ampullaceous or sometimes almost lecythiform, among other shapes; when mature they measure 14–21 x 4.5–7 µm (excluding the hyphal part). The hyphal part is less than 6 x 1–2 µm. The sterigmata (thin projections of the basidia that attach the to spore) are 4–6 µm long and mostly 1–1.5 µm thick. The hyphae located immediately underneath the basidia are thin-walled, 1–2 µm wide, provided with clamps and densely branched. The hyphae of the tramal plates are roughly parallel, thin-walled, 1–2 µm wide, and provided with clamps which may be dilated.[18]

The spores in mass are dark brown when mature. They are spherical, covered with "warts" or verrucae, and measure 5–6 µm in diameter (including ornamentation).[nb 2] The spores often contain a drop of oil. Scanning electron microscopy reveals the verrucae to be up to 0.8 µm long, conical to columnar processes with rounded to almost flattened tips. The apiculus (the part of a spore which attaches to the sterigmata at the end of a basidium) is distinct with radiating ridge-like processes. The young spore is first broadly egg-shaped before becoming roughly spherical in maturity.[18]

The capillitium refers to coarse, late-maturing, thick-walled cells in the gleba that develop pores or slits in their thick secondary walls. The capillitial hyphae are 1.5–9.5 µm wide, thick-walled, often with a narrow lumen, and with or without surface ornamentation. The columella hyphae are 1.5–14 µm wide (occasionally wider, up to 34 µm), thick-walled, often with narrow lumen. Single thin-walled, about 1.5 µm wide hyphae with clamps can be observed. The endoperidial hyphae are densely interwoven, thick-walled, and about 2–6 µm wide. The whitish powder on newly expanded specimens consists of crystalline matter and thin-walled, 1.5–4 µm wide, branched hyphae with clamps. The peristome hyphae are thick-walled, 2–11 µm wide. The pseudoparenchymatous layer is built up by bladder-like, thin-walled hyphae of varying size. On the surface of newly expanded specimens crystals and thin-walled hyphae of the same kind as on the endoperidium are present.[18] The crystals are calcium oxalate dihydrate that have the crystalline structure of a pyramid, and are arranged singly or in loose aggregates, 11 to 30 µm in size.[20] The fibrous layer has thick-walled hyphae 1.5–4 µm wide. The mycelial layer in the inner, very thin part (seen as a glossy lining on the fibrous layer of newly expanded fruit bodies) consists of a dense web of thin-walled, 1.5–4 µm wide, clamped hyphae. Thick-walled hyphae are also present, measuring 2–11 (sometimes up to 19) µm wide. The outer part (the mycelial cup) consists of thick-walled, branched and densely interwoven hyphae (often with a narrow lumen) that measure 1.5–4 µm wide.[18]

[edit] Similar species

*Geastrum quadrifidum* is readily confused with *G. fornicatum*, which is largerâ ~up to 15Â cm (5.9Â in)â ~and has smaller spores (4â ^5Â Î¼m in diameter).[21]*Geastrum minimum*, although small like *G. quadrifidum*, is distinguished by having more rays (usually more than seven), and it is not fornicate.[22] Also, its mycelial layer is attached to the fibrous layer for a long time, without forming a mycelial cup like *G. quadrifidum*. [10] The Chilean species *G. jurei* does not have a clearly demarcated peristome.[23]

*Geastrum quadrifidum* is also similar to *G. dissimile*, *G. leptospermum*, and *G. welwitschii* in its fruit body morphology, especially the exoperidial rays, endoperidial body, and peristome. *Geastrum dissimile* differs from *G. quadrifidum* by its often sulcate or silky fimbriate, smooth peristome, and slightly smaller spores (4â ^5Â Î¼m in diameter).[24]*Geastrum leptospermum* can be distinguished from *G. quadrifidum* by its smaller spores (2â ^3Â Î¼m in diameter),[25] and by its preference for growing in mosses on tree trunks. *G. welwitschii* differs from *G. quadrifidum* by its epigeal mycelial cup with a felted or tufted outer surface, and indistinctly delimited peristome.[18]

[edit] Distribution, ecology, and habitat

Although *Geastrum quadrifidum* has a wide distribution, it is not a common species. European countries from which the fungus has been reported include Belgium,[22][26] Denmark,[27] France,[28] Germany,[29]Montenegro,[30] Norway,[31] Poland,[32] and Sweden.[33] In Asia, it has been collected in China and Japan.[10] The North American distribution extends from Canada[13] south to Mexico,[34] and includes Hawaii.[35] It is also found in Australia[36] and New Zealand, South Africa, and South America.[37] Because of its rarity, it has been placed on the Regional Red Lists of several European countries, including Montenegro,[30] Denmark,[27] Norway,[38] and Poland.[32]

Like most earthstars, *G. quadrifidum* is a saprobic fungus, and spends most of its life cycle as thin strands of mycelium, deriving nutrients by decomposing leaf litter and similar detritus, converting it to humus and mineralizing organic matter in the soil.[39] The fungal fruit bodies are generally found in coniferous woodland, where they appear in summer and autumn. In Mexico, it was found in tropical thorn forest and pine-oak forest in the summer.[34] In Britain, all collections have been made in beech forest on calcareous soil.[26]

^ This name is not to be confused with *Geastrum coronatum*, a valid and distinct species that is independent of *G. quadrifidum*. [7]

^ Bates reports a slightly larger rangeâ ~5.6 to 6.4Â Âµmâ ~with an average of 6.1Â Âµm.[19]

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#### [edit] External links

Martha Layne Collins (née Hall, born December 7, 1936) is an American former businesswoman and politician from the U.S. state of Kentucky who was the state's 56th governor from 1983 to 1987. Prior to her election as governor, she was the 48th Lieutenant Governor of Kentucky, under John Y. Brown, Jr. As of 2012, she is the only woman to have been a governor of Kentucky. Her election made her the highest-ranking Democratic woman in the U.S. She was considered as

a possible running mate for Democratic presidential nominee Walter Mondale in the 1984 presidential election, but Mondale chose Geraldine Ferraro instead.

After graduating from the University of Kentucky, Collins worked as a school teacher while her husband finished a degree in dentistry. She became interested in politics, and worked on both Wendell Ford's gubernatorial campaign in 1971 and Walter "Dee" Huddleston's U.S. Senate campaign in 1972. In 1975, she was chosen secretary of the state's Democratic Party and was elected clerk of the Kentucky Court of Appeals. During her tenure as clerk, a constitutional amendment restructured the state's judicial system, and the Court of Appeals became the Kentucky Supreme Court; Collins continued as clerk of the renamed court and worked to educate citizens about the court's new role.

Collins was elected lieutenant governor in 1979, under Governor John Y. Brown, Jr. Brown was frequently out of the state, leaving Collins as acting governor for more than 500 days of her four-year term. In 1983, she defeated Republican Jim Bunning to become Kentucky's first woman governor. Her administration had two primary focuses: education and economic development. After failing to secure increased funding for education in the 1984 legislative session, she conducted a statewide public awareness campaign in advance of a special legislative session the following year; the modified program was passed in that session. She successfully used economic incentives to bring a Toyota manufacturing plant to Georgetown, Kentucky in 1986. Legal challenges to the incentives— which would have cost the state the plant and its related economic benefits— were eventually dismissed by the Kentucky Supreme Court. The state experienced record economic growth under Collins' leadership.

At the time, Kentucky governors were not eligible for reelection. Collins taught at several universities after her four-year term as governor. From 1990 to 1996, she was the president of Saint Catharine College near Springfield, Kentucky. The 1993 conviction of Collins' husband, Dr. Bill Collins, in an influence-peddling scandal damaged her hopes for a return to political life. Prior to her husband's conviction it had been rumored that she would be a candidate for the U.S. Senate, or would take a position in the administration of President Bill Clinton. As of 2012 Collins is an executive scholar in residence at Georgetown College.

[edit] Early life

Martha Layne Hall was born December 7, 1936, in Bagdad, Kentucky,[1] the only child of Everett and Mary (Taylor) Hall.[2] When Martha was in the sixth grade, her family moved to Shelbyville, Kentucky, and opened the Hall-Taylor Funeral Home.[2] Martha was involved in numerous extracurricular activities both in school and at the local Baptist church.[2] Her parents were active in local politics, working for the campaigns of several Democratic candidates, and Hall frequently joined them, stuffing envelopes and delivering pamphlets door-to-door.[3]

Martha attended Shelbyville High School where she was a good student and a cheerleader.[4] She frequently competed in beauty pageants and won the title of Shelby County Tobacco Festival Queen in 1954.[4] After high school, she enrolled at Lindenwood College, an all-woman college in Saint Charles, Missouri.[5][4] After one year at Lindenwood, she transferred to the University of Kentucky in Lexington, Kentucky.[5] While there, she was active in many clubs, including the Chi Omega social sorority, the Baptist Student Union, and the home economics club, and was also the president of her dormitory and vice president of the house presidents council.[4]

In 1957, Martha met Billy Louis Collins while attending a Baptist camp in Shelby County.[2] Collins was a student at Georgetown College in Georgetown, Kentucky, about 13 miles from Lexington; he and Hall dated while finishing their degrees.[2] Martha earned a Bachelor of Science degree in Home Economics in 1959.[5] Having won the title of Kentucky Derby Festival Queen earlier that year, she briefly considered a career in modeling.[2] Instead, she and Collins married shortly after her graduation.[2] While Billy Collins pursued a degree in dentistry at the University of Louisville, Martha taught at Seneca High School and Fairdale High School, both in Louisville.[6] While in Louisville,

the couple had two children, Steve and Marla.[5]

In 1966, the Collinses moved to Versailles, Kentucky, where Martha taught at Woodford County Junior High School.[3] The couple became active in several civic organizations, including the Jaycees and Jayceettes and the Young Democratic Couples Club.[4] Through the club, they worked on behalf of Henry Ward's unsuccessful gubernatorial campaign in 1967.[4]

[edit] Early political career

By 1971, Collins was the president of the Jayceettes, and it was through that organization that she came to the attention of Democratic state senator Walter "Dee" Huddleston.[4] Huddleston asked Collins to co-chair Wendell Ford's gubernatorial campaign in the 6th District.[4] J.R. Miller, then-chairman of the state Democratic Party, commented that "She organized that district like you wouldn't believe." [3] After Ford's victory, he named her Democratic National Committeewoman from Kentucky.[1] She quit her teaching job and went to work full-time at the state Democratic Party headquarters, as secretary of the state Democratic party and as a delegate to the 1972 Democratic National Convention.[3][6] The following year, she worked for Huddleston's campaign for the U.S. Senate.[1]

In 1975, Collins won the Democratic nomination for clerk of the Kentucky Court of Appeals in a five-way primary.[3] In the general election, she defeated Republican Joseph E. Lambert by a vote of 382,528 to 233,442.[5] During her term, an amendment to the state constitution changed the name of the Court of Appeals to the Kentucky Supreme Court; Collins thus became the last person to hold the office of clerk of the Court of Appeals and the first to hold the office of clerk of the Supreme Court. As clerk, she compiled and distributed a brochure about the new role of the Supreme Court, and worked with the state department of education to create a teacher's manual for use in the public schools, detailing the changes effected in the court system as a result of the constitutional amendment. The Woodford County chapter of Business and Professional Women chose Collins as its 1976 Woman of Achievement, and in 1977, Governor Julian Carroll named her Kentucky Executive Director of the Friendship Force.[1]

In a field that included six major candidates, Collins secured the Democratic nomination for lieutenant governor in 1979, garnering 23 percent of the vote.[5] She defeated Republican Hal Rogers in the general election 543,176 to 316,798.[5] As lieutenant governor, she traveled the state, attending ceremonies in place of Democratic Governor John Y. Brown, Jr., who disliked such formal events and often chose not to attend.[7] By the end of her term, she declared that she had visited all 120 counties in Kentucky.[7] Governor Brown was frequently out of the state, leaving Collins as acting governor for more than 500 days of her four-year term.[8]

As lieutenant governor, Collins was responsible for presiding over the state Senate. Members of both major parties praised Collins for her impartiality and knowledge of parliamentary procedure in this role.[3] She was twice called upon to break tie votes in the Senate, once on a bill allowing the state's teachers to engage in collective bargaining and another on a bill to allow branch banking across county lines within the state; in both instances she voted in the negative, killing the bill.[3] During her tenure, she also chaired the National Conference of Lieutenant Governors, becoming the first woman to hold that position.[7] In 1982, she was named to the board of regents of the Southern Baptist Theological Seminary in Louisville.[9]

[edit] Gubernatorial election of 1983

Nearing the end of her term as lieutenant governor, Collins announced her intent to run for governor in 1983.[5] Her opponents for the Democratic nomination included Louisville mayor Harvey Sloane and Grady Stumbo, the former secretary of the state's Department of Human Resources.[3] Collins had the support of many leaders in the Democratic Party, but just before the primary, Governor Brown endorsed Stumbo, charging that both Sloane and Collins would use their gubernatorial appointment power to dispense party patronage. Although this was a common practice at the time, Brown notably and vocally shunned it

during his term.[5][10] With 223,692 votes, Collins edged out Sloane (219,160 votes) and Stumbo (199,795 votes) to secure the nomination.[5] Sloane asked for a recanvass of the ballots, but ultimately decided it would not change the outcome and conceded defeat.[11]

In the general election, Collins faced Republican state senator and future Baseball Hall of Fame pitcher Jim Bunning.[5] The National Organization for Women, the National Women's Campaign Fund, and the Women's Political Caucus all refused to endorse Collins, citing her lukewarm support for the Equal Rights Amendment and her opposition to abortion except in cases of rape, incest, or when the mother's life was in danger.[12] Bunning was not personable on the campaign trail and had difficulty finding issues that would draw traditionally Democratic voters to him.[13] His Catholicism was also a political liability.[13] Collins won the election by a vote of 561,674 to 454,650, becoming the first, and to date only, woman to be elected governor of Kentucky.[1][5]

Following her election, Collins donated the surplus \$242,000 from her campaign coffers to the state Democratic party. When Collins' husband was named state treasurer for the party at an annual salary of \$59,900 the state press charged that the move was a plot to funnel Collins' campaign funds into her personal account. (The previous Democratic state treasurer had received no salary during his tenure.) Following the media criticism, Dr. Collins resigned his post as treasurer; all of the involved individuals insisted that Governor Collins had not been briefed on the details of her husband's appointment. The media's criticism of Collins continued as many of the appointments to her executive cabinet went to inexperienced personnel who had held key positions in her past campaigns. When newly appointed Insurance Commissioner Gilbert McCarty approved a 17% rate increase requested by Blue Cross Blue Shield a request that his predecessor had denied a few days earlier Collins quickly countermanded the approval pending a public hearing on the matter.[14]

[edit] Governor

In her first address to the legislature, Collins asked for an additional \$324 million from the Kentucky General Assembly, most of it allocated for education.[5] The additional revenue was to be derived from Collins' proposed tax package, which included increasing the income tax on individuals making more than \$15,000 annually, extending the sales tax to cover services such as auto repair and dry cleaning, and increasing the corporate licensing tax.[15] After opposition to her proposal developed among legislators during the 1984 biennial legislative session, Collins revised the tax package, retaining the corporate licensing tax increase, but replacing the sales tax and income tax modifications with a flat five percent personal income tax and phasing out the deductions for depreciation that corporations could claim on their state taxes.[16] With the state still recovering from an economic recession and an election year upcoming, legislators refused to raise taxes, and Collins eventually withdrew her request and submitted a continuation budget instead.[5] Some education proposals advocated by Collins were passed, including mandatory kindergarten, remedial programs for elementary school children, mandatory testing and internship for teachers, and the implementation of academic receivership for underperforming schools.[17] Among the other accomplishments of the 1984 legislative session were passage of a tougher drunk driving law and a measure allowing state banking companies to purchase other banks within the state.[5]

[edit] Consideration for vice-president

By virtue of her election as Kentucky's governor, Collins became the highest-ranking Democratic woman in the nation.[18] The only two women in the U.S. Senate at the time were Republicans, and Collins was the only woman governor of any state.[18] Shortly after her election, she appeared on Good Morning America, where she was asked about her interest in the vice-presidency and gave a non-committal answer.[18] Four days after her inauguration as governor, she was chosen to deliver the Democratic response to President Ronald Reagan's weekly radio address.[19] At a news conference following her speech,



she was again asked if she would be willing to be considered as the Democrats' vice-presidential candidate in the upcoming election; she replied "No, not at this time." [19]

In mid-1984, the Democratic National Committee chose Collins to preside over the 1984 Democratic National Convention in San Francisco. [1] This engagement prevented Collins from holding the role of chair of the state delegation to the convention. [20] That designation was given to Collins' son, Steve. [20] Prior to the convention, Walter Mondale, the presumptive presidential nominee, interviewed Collins as a possible vice-presidential candidate before choosing Geraldine Ferraro as his running mate. [17] A writer for The Miami Herald later opined, based on interviews with Mondale advisors, that Collins was never given serious consideration by Mondale and that she was included in his list of potential running mates primarily to blunt potential charges of "tokenism" in considering other women and minorities. [21]

[edit] Education proposals

In January 1985, Collins renewed her push for additional education funding and changes by appointing herself secretary of the state Education and Humanities Cabinet. [22] Following the announcement, Collins and several key legislators held a series of meetings in every county, advocating for her proposed changes and seeking information about what types of changes the state's citizens desired. [23] At the meetings, Collins was careful to separate the issues of her proposed education plan and potential tax increases because she believed the issue of taxes had prevented her previous package from being enacted. [23]

Collins announced a new education package in June 1985 that included a five percent across-the-board pay raise for teachers, a reduction in class sizes, funding for construction projects, aides for every kindergarten teacher in the state, and a "power equalization" program to make funding for poorer school districts more equal to that of their more affluent counterparts. [24] After favorable reaction to the plan from legislators, she called a special legislative session to convene July 8 to consider the plan. [25] After two weeks of deliberation, the General Assembly approved Collins' education plan, tripling the corporate licensing tax to \$2.10 per \$1,000 in order to pay for the package. [26] The Assembly rejected a proposed five-cents-per-gallon increase in the state gasoline tax to finance other spending. [27]

Collins followed up her success in the 1985 special session with a push for more higher education funding in the 1986 legislative session. Lawmakers obliged by approving an additional \$100 million for higher education in the biennial budget. They also approved implementation of a pilot preschool program and the purchase of new reading textbooks, but failed to act on Collins' request for an additional \$3.9 million to improve the state's vocational education system. [28] Legislators approved calling a referendum on a constitutional amendment supported by Collins to make the state superintendent of education an appointive, rather than elective, office. [28] The amendment was defeated by the state's voters in November 1986, despite a Collins-led campaign in favor of it. [29] The increased corporate tax intended to cover the cost of the increased education budget was, however, inadequate. In 1987, a plan to increase revenue through changes in the state income tax was abandoned when Wallace Wilkinson, the Democratic gubernatorial nominee who would go on to succeed Collins, announced his opposition to it. [5]

[edit] Toyota Assembly Plant

In March 1985, Collins embarked on the first of several trade missions to Japan. [30] She returned there in October 1985, and also visited China a first for any Kentucky governor to encourage opening Chinese markets for Kentucky goods and to establish a "sister state" relationship with China's Jiangxi province. [30] Collins' efforts in Japan yielded her most significant accomplishment as governor convincing Toyota to locate an \$800 million manufacturing plant in Georgetown. [31] According to published reports, the Kentucky location was chosen over proposed sites in Indiana, Missouri, Tennessee, and Kansas. [32]

The agreement with Toyota was contingent upon legislative approval of \$125

million in incentives promised to Toyota by Collins and state Commerce Secretary Carroll Knicely.[31] They included \$35 million to buy and improve a 1,600 acres (650 ha) tract to be given to Toyota for the plant, \$33 million for initial training of employees, \$10 million for a skills development center for employees, and \$47 million in highway improvements near the site.[31] The incentive package was approved in the 1986 legislative session.[28] State Attorney General David L. Armstrong expressed concerns that the incentives might conflict with the state constitution by giving gifts from the state treasury to a private business, but concluded that the General Assembly had made "a good-faith effort to be in compliance with the constitution".[33]

Given Armstrong's concerns, the administration employed general counsel J. Patrick Abell to file a friendly test case to determine the constitutionality of the incentive package.[34] While the suit was pending, the Lexington Herald-Leader reported that the administration had failed to include the interest on the bonds used to finance the expenditures in its estimation of the cost; this, plus the cost overruns reported by the Herald-Leader, had already pushed the total cost of the package to about \$354 million by late September 1986.[35] In October, Toyota agreed to cover the cost overruns associated with preparing the site for construction.[36]

Opponents of the economic enticements for Toyota joined the state's test suit.[37] In October 1986, Franklin County Circuit Court Judge Ray Corns issued an initial ruling that the package did not violate the state constitution, but both sides asked the Kentucky Supreme Court to make a final decision.[37] On June 11, 1987, the Kentucky Supreme Court ruled that the package served a public purpose and were therefore constitutional.[37] Most of the opposition was blunted when Toyota set up several assembly plants across the state; near the end of Collins' term, the state Commerce Cabinet reported that 25 automotive-related manufacturing plants had been constructed in 17 counties since the Toyota announcement.[5][38]

In 1987, Collins promised \$10 million in state aid to Ford to incentivize the company to expand its truck assembly plant in Louisville.[39] The state experienced record job growth under Collins' economic development plan, which included attempts to attract both domestic and international companies.[5] The state's unemployment rate fell from 9.7 percent in October 1983 to 7.2 percent in October 1987; according to the administration's own figures, they created a net increase of 73,000 jobs in the state during Collins' tenure.[38]

[edit] Other matters during Collins' term

On October 7, 1987, Collins called a special legislative session to close a deficit between state contributions to the worker's compensation Special Fund and disbursements.[40] The Special Fund was designated for payments to workers with occupational diseases and workers whose work-related injuries could not be traced to any single employer.[41] A plan proposed by Democratic state senator Ed O'Daniel was expected to provide the framework for legislation considered in the session.[40] Under O'Daniel's plan, additional revenue for the Special Fund would be raised by increasing assessments on worker's compensation premiums for 30 years.[41] Assessments for coal companies were increased more than those on other businesses because the majority of the claims paid from the Special Fund were for black lung, a breathing disease common among coal miners; consequently, it was opposed by legislators from heavily coal-dependent counties.[41] Nevertheless, after nine days of negotiations, a bill substantially similar to O'Daniel's original plan was approved by the legislature and signed by Collins.[41]

Collins chaired the Tennessee-Tombigbee Waterway Authority and held that position when the waterway opened to the public in 1985.[42] On May 10, 1985, she was named to the University of Kentucky Alumni Association's Hall of Distinguished Alumni.[1] She also chaired the Southern Growth Policies Board, Southern States Energy Board, and was co-chair of the Appalachian Regional Commission.[42]

[edit] Activities after leaving office

Collins' term expired on December 8, 1987, and under the restrictions then

present in the Kentucky Constitution, she was ineligible for consecutive terms.[43] In 1988, she accepted a position as "executive in residence" at the University of Louisville, giving guest lectures to students in the university's business classes.[43] She also started an international trade consulting firm in Lexington.[5][43] When Western Kentucky University president Kern Alexander resigned to accept a position at Virginia Tech in 1988, Collins was among four finalists to succeed him.[44] Some faculty members publicly expressed concerns about Collins' lack of experience in academia, and she withdrew her name from consideration shortly before the new president was announced.[44]

After fulfilling her one-year commitment to the University of Louisville, Collins was named a fellow of the Harvard Institute of Politics' John F. Kennedy School of Government, teaching non-credit classes on leadership styles once a week.[45] Concurrent with her position at Harvard, Collins was named to the board of regents for Midway College in 1989; the following year, she was removed from the board of regents of Southern Baptist Theological Seminary.[9][46] Her removal was automatically triggered after she missed three consecutive board meetings between 1986 and 1989.[9] In 1990, Collins accepted the presidency of Saint Catharine College in Springfield, Kentucky, becoming the first president of the small, Catholic college who was not a Dominican nun.[47] College officials stated that Collins was recruited for the presidency to raise the college's profile.[47]

In 1993, Collins' husband, Bill, was charged in an influence-peddling scandal. The prosecution claimed that while Collins was governor, Dr. Collins exploited a perception that he could influence the awarding of state contracts through his wife.[48] It was alleged that he exploited this perception to pressure people who did business with the state to invest nearly \$2 million with him.[48] He was convicted on October 14, 1993, after a seven-week trial; he was given a sentence of five years and three months in federal prison, which was at the low end of the range prescribed by the federal sentencing guidelines.[49] He was also fined \$20,000 for a conspiracy charge that involved kickbacks disguised as political contributions.[48] Governor Collins was called to testify in the trial, but was not charged.[50] The scandal tarnished her image, however, and may have cost her an appointment in the administration of President Bill Clinton.[50] Collins was also rumored to be considering running for the U.S. Senate, a bid which never materialized following her husband's conviction.[50] The Collinses reunited following Dr. Collins' release from prison on October 10, 1997.[51]

In 1996, Collins resigned as president of Saint Catharine College to direct the International Business and Management Center at the University of Kentucky.[52] Later that year, she was a co-chair of the Credentials Committee at the Democratic National Convention.[53] When her contract with the University of Kentucky expired in 1998, Collins took a part-time position as "executive scholar in residence" at Georgetown College, which allowed her more time to pursue other interests.[54] In 1999, she was named Honorary Consul General of Japan in Kentucky, a position which involved promoting Japanese interests in Kentucky, encouraging Japanese investment in the state, and encouraging cultural understanding between Kentucky and Japan.[55] In 2001, Governor Paul E. Patton named her co-chair of the Kentucky Task Force on the Economic Status of Women.[50] In January 2005, she became the chairwoman and chief executive officer of the Kentucky World Trade Center.[56] She has held positions on the boards of directors for several corporations, including Eastman Kodak.[56]

[edit] Awards and honors

Women Leading Kentucky, a non-profit group designed to promote education, mentorship, and networking among Kentucky professional women, created the Martha Layne Collins Leadership Award in 1999 to recognize "a Kentucky woman of achievement who inspires and motivates other women through her personal, community and professional lives"; Collins was the first recipient of the award.[57] In 2003, Kentucky's Bluegrass Parkway was renamed the Martha Layne Collins Bluegrass Parkway in her honor; Collins also received the World Trade



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27. Elizabeth Howard

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Persondata

Name  
 Collins, Martha Layne  
 Alternative names  
 Short description  
 American businesswoman and politician  
 Date of birth  
 1936-12-07  
 Place of birth  
 Bagdad, Kentucky  
 Date of death  
 Place of death

RKO (Radio-Keith-Orpheum) Pictures is an American film production and distribution company. As RKO Radio Pictures Inc., it was one of the Big Five studios of Hollywood's Golden Age. The business was formed after the Keith-Albee-Orpheum (KAO) theater chains and Joseph P. Kennedy's Film Booking Offices of America (FBO) studio were brought together under the control of the Radio Corporation of America (RCA) in October 1928.[a] RCA chief David Sarnoff engineered the merger to create a market for the company's sound-on-film

technology, RCA Photophone. By the mid-1940s, the studio was under the control of investor Floyd Odlum.

RKO has long been celebrated for its cycle of musicals starring Fred Astaire and Ginger Rogers in the mid-to-late 1930s. Actors Katharine Hepburn and, later, Robert Mitchum had their first major successes at the studio. Cary Grant was a mainstay for years. The work of producer Val Lewton's low-budget horror unit and RKO's many ventures into the field now known as film noir have been acclaimed, largely after the fact, by film critics and historians. The studio produced two of the most famous films in motion picture history: King Kong and Citizen Kane.

Maverick industrialist Howard Hughes took over RKO in 1948. After years of decline under his control, the studio was acquired by the General Tire and Rubber Company in 1955. The original RKO Pictures ceased production in 1957 and was effectively dissolved two years later. In 1981, broadcaster RKO General, the corporate heir, revived it as a production subsidiary, RKO Pictures Inc. In 1989, this business with its few remaining assets, the trademarks and remake rights to many classic RKO films, was sold to new owners, who now operate the small independent company RKO Pictures LLC.

[edit] Origin of company

In October 1927, Warner Bros. released *The Jazz Singer*, the first feature-length talking picture. Its success prompted Hollywood to convert from silent to sound film production en masse. The Radio Corporation of America (RCA) controlled an advanced optical sound-on-film system, RCA Photophone, recently developed by General Electric. However, its hopes of joining in the anticipated boom in sound movies faced a major hurdle: Warner Bros. and Fox, Hollywood's other vanguard sound studio, were already financially and technologically aligned with ERPI, a subsidiary of AT&T's Western Electric division. The industry's two largest companies, Paramount and Loew's/MGM, with two other major studios, Universal and First National, were poised to contract with ERPI for sound conversion as well.[1]

Seeking a customer for Photophone, in late 1927 David Sarnoff, then general manager of RCA, approached Joseph Kennedy about using the system for Kennedy's modest-sized studio, Film Booking Offices of America (FBO). Negotiations resulted in General Electric acquiring a substantial interest in FBO. Sarnoff had apparently already conceived of a plan for the company to attain a central position in the film industry, maximizing Photophone revenue. Next on the agenda was securing a string of exhibition venues like those the leading Hollywood production companies owned. Kennedy began investigating the possibility of such a purchase. Around that time, the large Keith-Albee-Orpheum (KAO) circuit of theaters, built around the then-fading medium of live vaudeville, was attempting a transition to the movie business. In mid-1927, the filmmaking operations of Pathé (U.S.) and Cecil B. De Mille's Producers Distributing Corporation had united under KAO's control. Early in 1928, KAO general manager John J. Murdock, who had assumed the presidency of Pathé, turned to Kennedy as an adviser in consolidating the studio with De Mille's company, Producers Distributing Corporation (PDC). This was the relationship Sarnoff and Kennedy sought.[2][3][b]

After an aborted attempt by Kennedy to bring yet another studio that had turned to him for help, First National, into the Photophone fold, RCA was ready to step back in: the company acquired Kennedy's stock in both FBO and the KAO theater business. On October 23, 1928, RCA announced the creation of the Radio-Keith-Orpheum holding company, with Sarnoff as chairman of the board. Kennedy, who withdrew from his executive positions in the merged companies, kept Pathé separate from RKO and under his personal control.[2][4] RCA owned the governing stock interest in RKO, 22 percent; in the early 1930s, RCA's share of stock in the company rose as high as 60 percent.[5] The company's production and distribution arm, presided over by former FBO vice-president Joseph I. Schnitzer, was incorporated early in 1929 as Radio Pictures.[6] Looking to get out of the film business the following year, Kennedy arranged in late 1930 for RKO to purchase Pathé from him. On January 29, 1931, Pathé, with

its contract players, well-regarded newsreel operation, and Culver City studio and backlot, was merged into RKO as Kennedy sold off the last of his stock in the company he had been instrumental in creating.[7]

[edit] Golden Age studio

[edit] Early years

Declaring that it would make only all-talking films, RKO began shooting at the small facility FBO shared with Pathé in New York City while the main FBO studio in Hollywood was technologically refitted. In charge of production was William LeBaron, who had held the same position at FBO. The new company's two initial releases were musicals: The melodramatic *Syncopation* premiered on March 29, 1929.[8] The comedic *Street Girl* debuted July 30. This was billed as RKO's first "official" production—first to follow the formal incorporation of Radio Pictures, first to be made in Hollywood.[9][c] A few nonsinging pictures followed, but the studio's first major hit was again a musical. RKO spent heavily on the lavish *Rio Rita*, including a number of Technicolor sequences. Opening in September to rave reviews, it was named one of the ten best pictures of the year by *Film Daily*. [10] Cinema historian Richard Barrios credits it with initiating the "first age of the filmed Broadway musical". [11] By the end of the year, RKO was making use of an additional production facility—five hundred acres had been acquired near Encino in the San Fernando Valley as a backlot for exteriors and large-scale standing sets. [12]

RKO released a limited slate of twelve features in its first year; in 1930, that figure more than doubled to twenty-nine. [13] Originally organized as the distinct business entities RKO Productions Inc. and RKO Distributing Corp., by July the studio was making a transition to the new, unified RKO Radio Pictures Inc. [14] Encouraged by *Rio Rita*'s success, RKO produced several costly musicals incorporating Technicolor sequences, among them *Dixiana* and *Hit the Deck*, both scripted and directed, like *Rio Rita*, by Luther Reed. [15] Following the example of the other major studios, RKO had planned to create its own musical revue, *Radio Revels*. Promoted as the studio's most extravagant production to date, it was to be photographed entirely in Technicolor. [16] The project was abandoned, however, as the public's taste for musicals temporarily subsided. From a total of more than sixty Hollywood musicals in 1929 and over eighty the following year, the number dropped to eleven in 1931. [17] RKO was left in a bind: it still had a contract with Technicolor to produce two more features with its system. Complicating matters, audiences had come to associate color with the momentarily out-of-favor musical genre due to a glut of such productions from the major Hollywood studios. Fulfilling its obligations, RKO produced two all-Technicolor pictures, *The Runaround* and *Fanny Foley Herself* (both 1931), containing no musical sequences. Neither was a success. [18]

Even as the U.S. economy foundered, RKO had gone on a spending spree, buying up theater after theater to add to its exhibition chain. In October 1930, the company purchased a 50 percent stake in the New York's Van Beuren studio, which specialized in cartoons and live shorts. [19] RKO's production schedule soon surpassed forty features a year, released under the names "Radio Pictures" and, for a short time after the 1931 merger, "RKO Pathé". *Cimarron* (1931), produced by LeBaron himself, would become the only RKO production to win the Academy Award for Best Picture; nonetheless, having cost a profligate \$1.4 million to make, it was a money-loser on original domestic release. [20][d] The most popular RKO star of this pre-Code era was Irene Dunne, who made her debut as the lead in the 1930 musical *Leatherneking* and was a headliner at the studio for the entire decade. [21] Other major performers included Joel McCrea, Ricardo Cortez, Dolores del Río, and Mary Astor. Richard Dix, Oscar-nominated for his lead performance in *Cimarron*, would serve as RKO's standby B-movie star until the early 1940s. [22] The comedy team of Bert Wheeler and Robert Woolsey, often wrangling over ingenue Dorothy Lee, was a bankable mainstay for years. [23] Constance Bennett, Ann Harding, and Helen Twelvetrees came over with Pathé. [24] The Pathé acquisition, though a defensible investment in the long term for its physical facilities, was yet another major expense borne by the fledgling RKO, particularly as Pathé's stock price had been artificially

inflated by some prepurchase finagling.[25] After little more than a year of semiautonomous operation within RKO, Pathé was dissolved as a feature production unit.[26]

[edit] Success under Selznick

Exceptions like Cimarron and Rio Rita aside, RKO's product was largely regarded as mediocre, so in October, 1931, twenty-nine-year-old David O. Selznick visited Sarnoff in New York and convinced him to replace LeBaron as production chief.[27] As the new studio chief Selznick implemented rigorous cost-control measures, championed the unit production system, which gave the producers of individual movies much greater independence than they had under the prevailing central producer system. "Under the factory system of production you rob the director of his individualism", said Selznick, "and this being a creative industry that is harmful to the quality of the product made" (even though Selznick earned a sour reputation for meddling in director output).[28] Instituting unit production, he predicted, would also result in cost savings of 30 to 40 percent.[28] To make films under the new system, Selznick recruited prize behind-the-camera personnel, such as director George Cukor and producer/director Merian C. Cooper, and gave producer Pandro S. Berman, aged twenty-six, increasingly important projects.[29] Selznick discovered and signed a young actress who would become a star created by RKO, Katharine Hepburn. Also enlisted was established star John Barrymore for a few memorable performances.[30] From September 1932 on, print advertising for the company's features displayed the revised name "RKO Radio Pictures"; the Pathé name was used only for newsreels and documentaries.[e] That same year, the New York City-based corporate headquarters moved into the new RKO Building, an Art Deco skyscraper rising high above RKO controlled Radio City Music Hall that was one of the first Rockefeller Center structures to open.[31]

Selznick worked fifteen months as RKO production chief before resigning over a dispute with new corporate president Merlin Aylesworth, and then moved up to MGM to work for his powerful father-in-law, Louis B. Mayer.[32] One of his last acts at RKO was to approve a screen test for a thirty-three-year-old, balding Broadway song-and-dance man named Fred Astaire.[33] In a memo, Selznick wrote, "I feel, in spite of his enormous ears and bad chin line, that his charm is ... tremendous".[34] Selznick's tenure was widely considered a success: In 1931, before he arrived, the studio had produced forty-two features for \$16 million in total budgets (an average cost of \$380,000 per picture). In 1932, under Selznick, forty-one features were made for only \$10.2 million (an average budget of \$268,000 per feature), yet with improvement in polish and popularity.[35] He backed several major successes, including A Bill of Divorcement (1932), with Cukor directing Hepburn's debut, and the monumental King Kong (1933) — largely Merian Cooper's brainchild, brought to life by the astonishing special effects work of Willis O'Brien.[36] Still, shaky finances and excesses that marked the company's pre-Selznick days had not left RKO in good enough shape to withstand the Depression; the movie studio sank into receivership in early 1933, from which it did not emerge until 1940.[37]

[edit] Cooper at the helm

Cooper took over as production head after Selznick's departure and oversaw two hits starring Hepburn: Morning Glory (1933), for which she won her first Oscar, and Little Women (1933), director Cukor's second collaboration with the actress.[39] Among the studio's in-house productions, the latter was the biggest box-office success of the decade.[40] Ginger Rogers had already made several minor films for RKO when Cooper signed her to a seven-year contract and cast her in the big-budget musical Flying Down to Rio (1933).[41] Rogers was paired with Astaire, making his movie debut. Billed fourth and fifth respectively, the picture turned them into stars.[42] Hermes Pan, assistant to the film's dance director, would become one of Hollywood's leading choreographers through his subsequent work with Astaire.[43][44]

Along with Columbia Pictures, RKO became one of the primary homes of the screwball comedy. As film historian James Harvey describes, compared to their richer competition, the two studios were "more receptive to experiment, more



tolerant of chaos on the set. It was at these two lesser 'majors'...that nearly all the preeminent screwball directors did their important filmsâ ~[Howard] Hawks and [Gregory] La Cava and [Leo] McCarey and [George] Stevens." [45] The relatively unheralded William A. Seiter directed the studio's first significant contribution to the genre, *The Richest Girl in the World* (1934). [46] The drama *Of Human Bondage* (1934), directed by John Cromwell, was Bette Davis's first great success. [47] Stevens's *Alice Adams* and director John Ford's *The Informer* were each nominated for the 1935 Best Picture Oscarâ ~the Best Director statuette won by Ford was the only one ever given for an RKO production. [48] The *Informer*'s star, Victor McLaglen, also took home an Academy Award; he would appear in a dozen movies for the studio over a span of two decades. [49]

Lacking the financial resources of industry leaders MGM, Paramount, and Fox, RKO turned out many pictures during the era that made up for it with high style in an Art Deco mode, exemplified by such Astaireâ ^Rogers musicals as *The Gay Divorcee* (1934), their first pairing as leads, and *Top Hat* (1935). [50] One of the figures most responsible for this was creative Van Nest Polglase, chief of RKO's highly regarded design department for almost a decade. [51] [52] Film historian James Naremore has described RKO as "chiefly a designer's studio. It never had a stable of important actors, writers, or directors, but ... it was rich in artists and special-effects technicians. As a result its most distinctive pictures contained a strong element of fantasyâ ~not so much the fantasy of horror, which during the thirties was the province of Universal, but the fantasy of the marvelous and adventurous." [53]

As a group, the studio's craft divisions were among the strongest in the industry. [51] [54] Costumer Walter Plunkett, who worked with the company from the close of the FBO era through the end of 1939, was known as the top period wardrobe in the business. [55] Sidney Saunders, innovative head of the studio's paint department, was responsible for significant progress in rear projection quality. [56] On June 13, 1935, RKO premiered the first feature film shot entirely in advanced three-strip Technicolor, *Becky Sharp*. The movie was coproduced with Pioneer Pictures, founded by Cooperâ ~who departed RKO after two years helming productionâ ~and John Hay "Jock" Whitney, who brought in his cousin Cornelius Vanderbilt Whitney; Cooper had successfully encouraged the Whitneys to purchase a major share of the Technicolor business as well. [57] Though judged by critics a failure as drama, *Becky Sharp* was widely lauded for its visual brilliance and technical expertise. [58] RKO also employed some of the industry's leading artists and craftsmen whose work was never seen. From the studio's earliest days through late 1935, Max Steiner, regarded by many historians as the most influential composer of the early years of sound cinema, made music for over 100 RKO films. [44] [59] Murray Spivack, head of the studio's audio special effects department, made important advances in the use of rerecording technology first heard in *King Kong*. [60]

[edit] Briskin and Berman

In October 1935 the ownership team expanded, with financier Floyd Odlum leading a syndicate that bought 50 percent of RCA's stake in the company; the Rockefeller brothers, also major stockholders, increasingly became involved in the business. [61] While RKO made a concerted effort to promote Katharine Hepburn's career, her box office record while at the studio was checkered. Barbara Stanwyck joined the studio's rosterâ ~though Stanwyck would have little success during her few years there while Ann Sothorn enjoyed a career boost. Between 1935 and 1937 Miss Sothorn was paired five times with Gene Raymond out of her seven RKO films. [62] Then, in 1939 MGM finally found a replacement for the deceased Jean Harlow when they hired Sothorn. Cary Grant regularly appeared in RKO films for some years, but was one of the first leading men of the sound era to work extensively as a freelancer, under nonexclusive studio deals. [63] [f]

Soon after the appointment of a new production chief, Samuel Briskin, in late 1935, RKO entered into an important distribution deal with animator Walt Disney (Van Beuren consequently folded its cartoon operations). [65] From 1936 to 1954, the studio released Disney features and shorts; *Snow White and the Seven Dwarfs*

(1937) was the highest grossing movie in the period between *The Birth of a Nation* (1915) and *Gone with the Wind* (1939).[66] Following the change in print branding a few years earlier, the opening and closing logos on RKO movies, other than the Pathé nonfiction line, were changed from "Radio Pictures" to "RKO Radio Pictures" in 1936. In February 1937, Selznick, now an independent producer, leased RKO's Culver City studio and Forty Acres backlot. In addition to its central Hollywood studio, RKO productions now revolved around its vast Encino movie ranch. While the Disney association was beneficial, RKO's own product was viewed as declining in quality and Briskin was gone by the end of the year.[67]

Pandro Berman—who had filled in on three previous occasions—accepted the position of production chief on a noninterim basis. As it turned out, he would leave the job before the decade's turn, but his brief tenure resulted in some of the most notable films in studio history, including *Gunga Din*, with Grant and McLaglen; *Love Affair*, starring Dunne and Charles Boyer; and *The Hunchback of Notre Dame* (all 1939).[68] Charles Laughton, who gave a now fabled performance as Quasimodo in the latter, returned periodically to the studio, headlining six more RKO features.[69] For Maureen O'Hara, who made her American screen debut in the film, it was the first of ten pictures she would make for RKO through 1952.[70] After co-starring with Ginger Rogers for the eighth time in *The Story of Vernon and Irene Castle* (1939), Fred Astaire departed the studio.[71]

The studio's B Western star of the period was George O'Brien, who made eighteen RKO pictures, sixteen between 1938 and 1940. *The Saint in New York* (1938) successfully launched a B detective series featuring the character Simon Templar that would run through 1943.[72] The Wheeler and Woolsey comedy series ended in 1937 when Woolsey became ill (he died the following year). RKO filled the void by releasing independently produced features such as the Dr. Christian series and the Laurel and Hardy comedy *The Flying Deuces* (1939).[73] The studio soon had its own new B comedy star in Lupe Vélez: *The Girl from Mexico* (1939) was followed by seven frantic installments of the Mexican Spitfire series, all featuring Leon Errol, between 1940 and 1943.[72] The studio's technical departments maintained their reputation as industry leaders; Vernon Walker's special effects unit became famous for its sophisticated use of the optical printer and lifelike matte work, an art that would reach its apex with 1941's *Citizen Kane*. [74]

[edit] Kane and Schaefer's troubles

Pan Berman had received his first screen credit in 1925 as a nineteen-year-old assistant director on FBO's *Midnight Molly*. [76] He departed RKO in December 1939 after policy clashes with studio president George J. Schaefer, handpicked the previous year by the Rockefellers and backed by Sarnoff. [77] With Berman gone, Schaefer became in effect production chief, though other men—including the former head of the industry censorship board, Joseph I. Breen—nominally filled the role. [78] Schaefer, announcing his philosophy with a new studio slogan, "Quality Pictures at a Premium Price", was keen on signing up independent producers whose films RKO would distribute. [79] In 1941, the studio landed one of the most prestigious independents in Hollywood when it arranged to handle Samuel Goldwyn's productions. The first two Goldwyn pictures released by the studio were highly successful: *The Little Foxes*, directed by William Wyler and starring Bette Davis, garnered four Oscar nominations, [80] while the Howard Hawks—directed *Ball of Fire* at last brought Barbara Stanwyck a hit under the RKO banner. However, Schaefer agreed to terms so favorable to Goldwyn that it was next to impossible for the studio to make money off his films. [81] David O. Selznick loaned out his leading contracted director for two RKO pictures in 1941: Alfred Hitchcock's *Mr. and Mrs. Smith* was a modest success and *Suspicion* a more substantial one, with an Oscar-winning turn by Joan Fontaine. [h]

That May, RKO released *Citizen Kane*, coproducing with director Orson Welles's Mercury Productions. While it opened to strong reviews and would go on to be hailed as one of the greatest movies ever made, it lost money at the time and brought down the wrath of the Hearst newspaper chain on RKO. [82] The next year

saw the commercial failure of Welles's *The Magnificent Ambersons*—like Kane, critically lauded and overbudget—and the expensive embarrassment of his aborted documentary *It's All True*.<sup>[83]</sup> The three Mercury productions combined to drain \$2 million from the RKO coffers, major money for a corporation that had reported an overall deficit of \$1 million in 1940 and a nominal profit of a bit more than \$500,000 in 1941.<sup>[i]</sup> Many of RKO's other artistically ambitious pictures were also dying at the box office and it was losing its last exclusive deal with a major star as well. Rogers, after winning an Oscar in 1941 for her performance in the previous year's *Kitty Foyle*, held out for a freelance contract like Grant's; after 1943, she would appear in just one more RKO production, thirteen years later.<sup>[84]</sup> On June 17, 1942, Schaefer tendered his resignation.<sup>[85]</sup> He departed a weakened and troubled studio, but RKO was about to turn the corner. Propelled by the box-office boom of World War II and guided by new management, RKO would make a strong comeback over the next half-decade.<sup>[86]</sup>

[edit] Rebound under Koerner

By the end of June 1942, Floyd Odlum had taken over a controlling interest in the company via his Atlas Corporation, edging aside the Rockefellers and Sarnoff. Charles Koerner, former head of the RKO theater chain and allied with Odlum, had assumed the title of production chief some time prior to Schaefer's departure.<sup>[87]</sup> With Schaefer gone, Koerner could actually do the job; announcing a policy of "entertainment, not genius" (a snipe at Schaefer's artistic ambitions in general and his sponsorship of Welles in particular),<sup>[88]</sup> he brought the studio much-needed stability until his death in February 1946.<sup>[86][89]</sup> The change in RKO's fortunes was virtually immediate: corporate profits rose from \$736,241 in 1942 (the theatrical division compensating for the studio's \$2.34 million deficit) to \$6.96 million the following year.<sup>[90]</sup> The Rockefellers sold off their stock and, early in 1943, RCA dispensed with the last of its holdings in the company as well, cutting David Sarnoff's ties to the studio that was largely his conception.<sup>[91]</sup> In June 1944, RKO created a television production subsidiary, RKO Television Corporation, to provide content for the new medium. RKO became the first major studio to produce for television with *Talk Fast, Mister*, a one-hour drama filmed at RKO-Pathé studios in New York and broadcast by the DuMont network's New York station, WABD, on December 18, 1944. In collaboration with Mexican businessman Emilio Azcárraga Vidaurreta, RKO established Estudios Churubusco in Mexico City in 1945.<sup>[92]</sup>

With RKO on increasingly secure ground, Koerner sought to increase its output of handsomely budgeted, star-driven features. However, the studio's only remaining major stars under anything like extended contracts were Grant, whose services were shared with Columbia Pictures, and O'Hara, shared with Twentieth Century-Fox.<sup>[94][95]</sup> Lacking in-house stars, Koerner and his successors under Odlum arranged with the other studios to loan out their biggest names or signed one of the growing number of freelance performers to short-term, "pay or play" deals. Thus RKO pictures of the mid- and late forties offered Bing Crosby, Henry Fonda, and others who were out of the studio's price range for extended contracts.<sup>[96]</sup> John Wayne appeared in 1943's *A Lady Takes a Chance* while on loan from Republic Pictures; he was soon working regularly with RKO, making nine more movies for the studio.<sup>[97]</sup> Gary Cooper appeared in RKO releases produced by Goldwyn and, later, the startup International Pictures,<sup>[98]</sup> and Claudette Colbert starred in a number of RKO coproductions.<sup>[99]</sup> Ingrid Bergman appeared under a variety of hats: on loan out from Selznick in *The Bells of St. Mary's* (1945), the biggest hit of any in-house RKO production during the 1940s;<sup>[40]</sup> in the coproductions *Notorious* (1946) and *Stromboli* (1950); and in the independently produced *Joan of Arc* (1948).<sup>[100]</sup> Freelancing Randolph Scott appeared in one major RKO release annually from 1943 through 1948.<sup>[101]</sup>

In similar fashion, many leading directors made one or more films at RKO during this era, including Alfred Hitchcock once more, with *Notorious*, and Jean Renoir, with *This Land Is Mine* (1943), reuniting Laughton and O'Hara, and *The Woman on the Beach* (1947).<sup>[102]</sup> John Ford's *The Fugitive* (1947) and *Fort Apache* (1948), which appeared right before studio ownership changed hands again, were

followed by *She Wore a Yellow Ribbon* (1949) and *Wagon Master* (1950); all four were co-productions between RKO and Argosy, the company run by Ford and RKO alumnus Merian C. Cooper.[103] Of the directors under long-term contract to RKO in the 1940s, the best known was Edward Dmytryk, who first came to notice with the remarkably profitable *Hitler's Children* (1943). Shot on a \$205,000 budget placing it in the bottom quartile of Big Five studio productions, it was one of the ten biggest Hollywood hits of the year.[104][j] Another low-cost war-themed film directed by Dmytryk, *Behind the Rising Sun*, released a few months later, was similarly profitable.[40][105]

[edit] Focus on B movies

Much more than the other Big Five studios, RKO relied on B pictures to fill up its schedule. Of the thirty-one features released by RKO in 1944, for instance, ten were budgeted below \$200,000, twelve were in the \$200,000 to \$500,000 range, and only nine cost more. In contrast, a clear majority of the features put out by the other top four studios were budgeted at over a half a million dollars.[106] A focus on B pictures limited the studio's financial risk; while it also limited the potential for reward (Dmytryk's extraordinary coups aside), RKO had a history of making better profits with its run-of-the-mill and low-cost product than with its A movies.[5] The studio's low-budget films offered training opportunities for new directors, as well, among them Mark Robson, Robert Wise, and Anthony Mann.[107][108] Robson and Wise received their first directing assignments with producer Val Lewton, whose specialized B horror unit also included the more experienced director Jacques Tourneur. The Lewton unit's moody, atmospheric workâ ~represented by films such as *Cat People* (1942), *I Walked with a Zombie* (1943), and *The Body Snatcher* (1945)â ~is now highly regarded.[107][109] Richard Dix concluded his lengthy RKO career with the 1943 Lewton production *The Ghost Ship*. [110] Tim Holt was RKO's cowboy star of the era, appearing in forty-six B Westerns and more than fifty movies altogether for the studio.[111] In 1940, Chester Lauck and Norris Goff brought their famous comic characters Lum and Abner from radio to RKO for a six-film run.[112] The *Falcon* detective series began in 1941; the *Saint* and the *Falcon* were so similar that *Saint* creator Leslie Charteris sued RKO.[113] The *Falcon* was first played by George Sanders, who had appeared five times as the *Saint*. He bowed out after four *Falcon* films and was replaced by his brother, Tom Conway. Conway had a nine-film run in the part before the series ended in 1946. Johnny Weissmuller starred in six *Tarzan* pictures for RKO between 1943 and 1948 before being replaced by Lex Barker.[62]

Film noir, to which lower budgets lent themselves, became something of a house style at the studio, indeed, the RKO B *Stranger on the Third Floor* (1940) is widely seen as initiating noir's classic period.[114] Its cinematographer, Nicholas Musuraca, who began at FBO in the 1920s and stayed with RKO through 1954, is a central figure in creating the look of classic noir.[115] Design chief Albert D'Agostinoâ ~another long-term, who succeeded Van Nest Polglase in 1941â ~and art director Walter Keller, along with others in the department, such as art directors Carroll Clark and Jack Okey and set decorator Darrell Silvera, are similarly credited.[116] The studio's 1940s list of contract players was filled with noir regulars: Robert Mitchum (who graduated to major star status) and Robert Ryan each made no fewer than ten film noirs for RKO.[117] Gloria Grahame, Jane Greer, and Lawrence Tierney were also notable studio players in the field.[118] Freelancer George Raft starred in two noir hits: *Johnny Angel* (1945) and *Nocturne* (1946).[119] Tourneur, Musuraca, Mitchum, and Greer, along with D'Agostino's design group, joined to make the A-budgeted *Out of the Past* (1947), now considered one of the greatest of all film noirs.[120] Nicholas Ray began his directing career with the noir *They Live by Night* (1948), the first of a number of well-received films he made for RKO.[121] A big money maker were the dark and moody *Dick Tracy* detective film series; *Dick Tracy*, *Detective* (1945), *Dick Tracy vs. Cueball* (1946) (as "Filthy Flora" character actress Esther Howard chewed up the scenery in this one), *Dick Tracy's Dilemma* (1947), and *Dick Tracy Meets Gruesome* (1947), (RKO wanted to title this feature "*Dick Tracy vs. Karloff*", but Boris Karloff nixed that idea, even though he did play

the part of Gruesome).

[edit] HUAC and Howard Hughes

RKO, and the movie industry as a whole, had its most profitable year ever in 1946. A Goldwyn production released by RKO, *The Best Years of Our Lives*, was the most successful Hollywood film of the decade.[124] But the legal status of the industry's reigning business model was increasingly being called into doubt: the U.S. Supreme Court ruled in *Bigelow v. RKO* that the company was liable for damages under antitrust statutes for having denied an independent movie house access to first run filmsâ ~a common practice among all of the Big Five.[125] With profits at a high point, Floyd Odlum cashed in by selling off about 40 percent of his shares in the company to a group of investment firms.[126] After Koerner's death, Radio-Keith-Orpheum president N. Peter Rathvon and RKO Radio Pictures president Ned Depinet had exchanged positions, with Depinet moving to the corporate offices in New York and Rathvon relocating to Hollywood and doubling as production chief while a permanent replacement was sought for Koerner. On the first day of 1947, producer and Oscar-winning screenwriter Dore Schary, who had been working at the studio on loan from Selznick, took over the role.[127]

RKO appeared in good shape to build on its recent successes, but the year brought a number of unpleasant harbingers for all of Hollywood. The British government imposed a 75 percent tax on films produced abroad; along with similarly confiscatory taxes and quota laws enacted by other countries, this led to a sharp decline in foreign revenues.[128][129] The postwar attendance boom peaked sooner than expected and television emerged as a competitor for audience interest. Across the board, profits fellâ ~a 27 percent drop for the Hollywood studios from 1946 to 1947.[130] The phenomenon that would become known as McCarthyism was building strength, and in October, the House Un-American Activities Committee (HUAC) began hearings into Communism in the motion picture industry. Two of RKO's top talents, Dmytryk and producer Adrian Scott, refused to cooperate. As a consequence, they were fired by RKO per the terms of the Waldorf Statement, the major studios' pledge to "eliminate any subversives". Scott, Dmytryk, and eight others who also defied HUACâ ~dubbed the Hollywood Tenâ ~were blacklisted across the industry.[131] Ironically, the studio's major success of the year was *Crossfire*, a Scottâ ^Dmytryk film.[132] Odlum concluded it was time to exit the film business, and he put his remaining RKO sharesâ ~approximately 25 percent of the outstanding stockâ ~on the market.[133] Before the turn of the year, the Pathé®-branded newsreel was sold to Warner Bros.[129] For her performance in *The Farmer's Daughter* (1947), a coproduction with Selznick's Vanguard Films, Loretta Young won the Best Actress Oscar the following March. It would turn out to be the last major Academy Award for an RKO picture.[134]

In May 1948, eccentric aviation tycoon and occasional movie producer Howard Hughes gained control of the company, beating out British film magnate J. Arthur Rank as the buyer of Odlum's interest.[135] During Hughes's tenure, RKO suffered its worst years since the early 1930s, as his capricious management style took a heavy toll. Production chief Schary quit almost immediately due to his new boss's interference and Rathvon soon followed.[136] Within weeks of taking over, Hughes had dismissed three-fourths of the work force; production was virtually shut down for six months as the conservative Hughes shelved or canceled several of the "message pictures" that Schary had backed. Once shooting picked up again, Hughes quickly became notorious for meddling in minute production matters, particularly the presentation of actresses he favored.[137] All of the Big Five saw their profits dwindle in 1948â ~from Fox, down 11 percent, to Loew's/MGM, down 62 percentâ ~but at RKO they virtually vanished: from \$5.1 million in 1947 to \$0.5 million, a drop of 90 percent.[138] The production-distribution end of the RKO business, now deep in the red, would never make a profit again.[139]

Offscreen, Robert Mitchum's arrest and conviction for marijuana possessionâ ~he would serve two months in jailâ ~was widely assumed to mean career death for RKO's most promising young star, but Hughes surprised the industry by

announcing that his contract was not endangered.[140] Of much broader significance, Hughes decided to get the jump on his Big Five competitors by being the first to settle the federal government's antitrust suit against the major studios, which had won a crucial Supreme Court ruling in *United States v. Paramount Pictures, Inc.* Under the consent decree he signed, Hughes agreed to dissolve the old parent company, Radio-Keith-Orpheum Corp., and split RKO's production-distribution business and its exhibition chain into two entirely separate corporationsâRKO Pictures Corp. and RKO Theatres Corp.âwith the obligation to promptly sell off one or the other. While Hughes delayed the divorcement procedure until December 1950 and didn't actually sell his stock in the theater company for another three years, his decision to acquiesce was one of the crucial steps in the collapse of classical Hollywood's studio system.[141]

[edit] Turmoil under Hughes

While Hughes's time at RKO was marked by dwindling production and a slew of expensive flops, the studio continued to turn out some well-received films under production chiefs Sid Rogell and Sam Bischoff, though both became fed up with Hughes's meddling and quit after less than two years. (Bischoff would be the last man to hold the job under Hughes.)[144] There were B noirs such as *The Window* (1949), which turned into a hit,[145] and *The Set-Up* (1949), directed by Robert Wise and starring Robert Ryan, which won the Critic's Prize at the Cannes Film Festival.[146] *The Thing from Another World* (1951), a science-fiction drama coproduced with Howard Hawks's Winchester Pictures, is seen as a classic of the genre.[147] In 1952, RKO put out two films directed by Fritz Lang, *Rancho Notorious* and *Clash by Night*. The latter was a project of the renowned Jerry WaldâNorman Krasna production team, lured by Hughes from Warner Bros. with great fanfare in August 1950.[148]

The company also began a close working relationship with Ida Lupino. She starred in two suspense films with Robert RyanâNicholas Ray's *On Dangerous Ground* (1952, though shooting had been completed two years earlier) and *Beware, My Lovely* (1952), a coproduction between RKO and Lupino's company, *The Filmakers*. [149] Of more historic note, Lupino was Hollywood's only female director during the period; of the five pictures *The Filmakers* made with RKO, Lupino directed three, including her now celebrated *The Hitch-Hiker* (1953). [150] Exposing many moviegoers to Asian cinema for the first time, RKO distributed Akira Kurosawa's epochal *Rashomon* in the United States, sixteen months after its original 1950 Japanese release. [151] The only smash hits released by RKO in the 1950s came out during this period, but neither was an in-house production: Goldwyn's *Hans Christian Andersen* (1952) was followed by Disney's *Peter Pan* (1953). [40][152]

In early 1952, Hughes fought off a lawsuit by screenwriter Paul Jarrico, who had been caught up in the latest round of HUAC hearingsâHughes had fired him and removed his name from the credits of a recent release. The studio owner subsequently ordered 100 RKO employees on "leave of absence" while he established a "security office" to oversee an ideological vetting system. "We are going to screen everyone in a creative or executive capacity", he declared. "The work of Communist sympathizers will not be used." [153] As more credits were expunged, some in the industry began to question whether Hughes's hunt for subversives served primarily as a convenient rationale for further curtailing production and trimming expenses. [154]

In September, Hughes and his corporate president, Ned E. Depinet, sold their RKO studio stock to a Chicago-based syndicate with no experience in the movie business; the syndicate's chaotic reign lasted until February 1953, when the stock and control were reacquired by Hughes. [155] The studio's net loss in 1952 was over \$10 million, and shooting had taken place for just a single in-house production over the last five months of the year. [156] During the turmoil, Samuel Goldwyn ended his 11-year-long distribution deal with RKO. Wald and Krasna escaped their contracts and the studio as well. The deal that brought the team to RKO had called for them to produce sixty features over five years; in just shy of half that time, they succeeded in making four. [157] The RKO

Encino movie ranch shut down permanently in 1954 and the property was sold off.[158] Jack Webb's 'DRAGNET' NBC television series was the last project to film on the rundown movie ranch for an episode entitled "The Big Producer", where the lot played the part of a crumbling "Westside Studios". In November, Hughes finally fulfilled his obligations under the 1948 consent decree, divesting RKO Theatres; Albert A. List purchased the controlling interest in the business and renamed it List Industries.[159] Hughes soon found himself the target of no less than five separate lawsuits filed by minority shareholders in RKO, accusing him of malfeasance in his dealings with the Chicago group and a wide array of acts of mismanagement. "RKO's contract list is down to three actors and 127 lawyers", quipped Dick Powell.[160]

Looking to forestall the impending legal imbroglio, in early 1954 Hughes offered to buy out all of RKO's other stockholders. Convinced that the studio was sinking, Walt Disney ended his arrangement with RKO and set up his own distribution firm, Buena Vista Pictures.[161] By the end of the year, at a cost of \$23.5 million, Hughes had gained near-total control of RKO Pictures, becoming the first virtual sole owner of a studio since Hollywood's pioneer days. Virtual, but not quite actual. Floyd Odlum reemerged to block Hughes from acquiring the 95 percent ownership of RKO stock he needed to write off the company's losses against his earnings elsewhere. Hughes had reneged on his promise to give Odlum first option on buying the RKO theater chain when he divested it and was now paying the price.[162] With negotiations between the two at a stalemate, in July 1955, Hughes turned around and sold RKO pictures to the General Tire and Rubber Company for \$25 million.[163] For Hughes, this was the effective end of a quarter-century's involvement in the movie business. Historian Betty Lasky describes Hughes's relationship with RKO as a "systematic seven-year rape." [164]

[edit] General Tire and studio's demise

In taking control of the studio, General Tire restored RKO's links to broadcasting. General Tire had bought the Yankee Network, a New England regional radio network, in 1943.[166] In 1950, it purchased the West Coast regional Don Lee Broadcasting System,[167] and two years later, the Bamberger Broadcasting Service, owner of the WOR TV and radio stations in New York City.[168] The latter acquisition gave General Tire majority control of the Mutual Broadcasting System, one of America's leading radio networks.[169] General Tire then merged its broadcasting interests into a new division, General Teleradio.[170]

Thomas O'Neil, son of General Tire's founder William O'Neil and chairman of the broadcasting group, saw that the company's new television stations, indeed all TV outlets, were in need of programming. With the purchase of RKO, the studio's library was his, and rights to the 742 films to which RKO retained clear title were quickly put up for sale. C&C Television Corp., a subsidiary of beverage maker Cantrell & Cochrane, won the bidding in December 1955. It was soon offering the films to independent stations in a package called "MovieTime USA".[171][172] RKO Teleradio Picturesâ ~the new company created from the merger of General Teleradio and the RKO studioâ ~retained the broadcast rights for the cities where it owned TV stations. By 1956, RKO's classic movies were playing widely on television, allowing many to see such films as Citizen Kane for the first time. The \$15.2 million RKO made on the deal convinced the other major studios that their libraries held profit potentialâ ~a turning point in the way Hollywood did business.[171][173]

The new owners of RKO made an initial effort to revive the studio, hiring veteran producer William Dozier to head production.[174][175] A needed cash infusion was realized in 1954 when the 89 acre RKO Encino movie ranch was sold off to make way for a new tract home development. During the first half of 1956, the production facilities were as busy as they had been in a half-decade.[174][176] RKO Teleradio Pictures released Fritz Lang's final two American films, While the City Sleeps and Beyond a Reasonable Doubt (both 1956), but years of mismanagement had driven away many directors, producers, and stars.[115] The studio was also saddled with the last of the inflated B

movies such as Pearl of the South Pacific (1955) and The Conqueror (1956) that enchanted Hughes.[177] The latter, starring John Wayne, was the biggest hit produced at the studio during the decade, but its \$4.5 million in North American rentals did not come close to covering its \$6 million cost.[40]

After a year and a half without a notable success, General Tire abruptly closed down production at RKO for good at the end of January 1957, three productions already in progress were never completed. The Hollywood and Culver City facilities were sold later that year for \$6.15 million to Desilu Productions, owned by Desi Arnaz and Lucille Ball, who had been an RKO contract player from 1935 to 1942.[178] Desilu would be acquired by Gulf and Western Industries in 1967 and merged into G+W's other production company, Paramount Pictures; the former RKO Hollywood studio became home to Paramount Television (now CBS Paramount Television), which it remains to this day. The renovated Culver City studio is now owned and operated as an independent production facility.[179] Forty Acres, the Culver City backlot, was razed in the mid-1970s.[180] List Industries, the former RKO Theatres Corp., was acquired by Glen Alden Corp. in 1959. After Glen Alden's 1967 acquisition of the Stanley Warner theater group, the two chains were merged into RKO's Stanley Warner Theatres. Cinerama purchased the exhibition circuit from Glen Alden in 1971.[181]

With the closing down of production, RKO also shut its distribution exchanges; from 1957 forward, remaining pictures were released through other companies, primarily Universal-International. The final RKO film, Verboten!, a coproduction with director Samuel Fuller's Globe Enterprises, was released by Columbia Pictures in March 1959.[182] That same year, "Pictures" was stripped from the corporate identity; the holding company for General Tire's broadcasting operation and the few remaining motion picture assets was renamed RKO General.[183][k] In the words of scholar Richard B. Jewell, "The supreme irony of RKO's existence is that the studio earned a position of lasting importance in cinema history largely because of its extraordinarily unstable history. Since it was the weakling of Hollywood's 'majors,' RKO welcomed a diverse group of individualistic creators and provided them...with an extraordinary degree of freedom to express their artistic idiosyncrasies.... [I]t never became predictable and it never became a factory." [184]

[edit] RKO General

Main article: RKO General

One of North America's major radio and television broadcasters from the 1950s through the late 1980s, RKO General traces its roots to the 1943 purchase of the Yankee Network by General Tire. In 1952, the company united its newly expanded broadcasting interests into a division dubbed General Teleradio. With the tire manufacturer's acquisition of the RKO film studio in 1955, its media businesses were brought together under the rubric of RKO Teleradio Pictures. In 1959, following the breakup of the movie studio, the media division was given the name it would operate under for the next three decades, RKO General. In addition to its broadcasting activities, RKO General was also the holding company for many of General Tire's (and, after its parent company's reorganization, GenCorp's) other noncore businesses, including soft-drink bottling, Musac (dept. store and elevator piped-in) music, Video Independent Theatre (135 theatres strong) Circuit, hotel enterprises, and, for seventeen years, the original Frontier Airlines.[185]

The RKO General radio lineup included some of the highest rated, most influential popular music stations in North America. In May 1965, KHJ (AM) in Los Angeles introduced the Boss Radio variation of the top 40 format. The restrictive programming style was soon adopted by many of RKO's other stations and imitated by non-RKO broadcasters around the country.[186] RKO's FM station in New York pioneered numerous formats under a variety of call letters, including WOR and WXLO ("99X"); in 1983, as WRKS ("98.7 Kiss FM"), it became one of the first major stations to regularly program rap music.[187] In 1979, RKO General created the RKO Radio Network, reportedly the first broadcasting web linked via satellite.[188]



The company's television stations, for the most part non-network affiliated, were known for showing classic films (both RKO productions and many others) under the banner of Million Dollar Movie, launched by New York's WOR-TV in 1954.[189] In June 1962, RKO General and Zenith Electronics initiated what became the first extended venture into subscription television service: through early 1969, Hartford, Connecticut's WHCT-TV aired movies, sports, classical and pop music concerts, and other live performances without commercials, generating income from descrambler installation and weekly rental fees as well as individual program charges.[190] However, RKO General's most notable legacy is what may be the longest licensing dispute in television history. It began in 1965, when General Tire was accused of obliging vendors to buy advertising with one of its stations if they wanted to keep their contracts. More than two decades' worth of legal actions ensued, eventually forcing GenCorp (the parent company since 1983 of both General Tire and RKO General) to sell off its broadcast holdings under FCC pressure. RKO General exited the media business permanently in 1991.[185][191]

[edit] Later incarnations

Beginning with 1981's Carbon Copy, RKO General became involved in the coproduction of a number of feature films and TV projects through a subsidiary created three years earlier, RKO Pictures Inc.[192] In collaboration with Universal Studios, RKO put out five films over the next three years. Though the studio frequently worked with major namesâ ~including Burt Reynolds and Dolly Parton in The Best Little Whorehouse in Texas, Jack Nicholson in The Border, and Nastassja Kinski in Cat People (all 1982)â ~it met with little success. Starting with the Meryl Streep vehicle Plenty (1985), RKO took on more projects as sole studio backer. Films such as the erotic thriller Half Moon Street (1986) and the Vietnam War drama Hamburger Hill (1987) followed, but production ended as GenCorp underwent a massive reorganization following an attempted hostile takeover.[185] With RKO General dismantling its broadcast business, RKO Pictures Inc., along with the original RKO studio's trademark, remake rights, and other remaining assets, was spun off and put up for sale. After a bid by RKO Pictures' own managers failed, it was acquired in late 1987 by Wesray Capital Corporationâ ~under the control of former U.S. Secretary of the Treasury William E. Simon and Ray Chambersâ ~and linked with their Six Flags amusement parks to form RKO/Six Flags Entertainment Inc.[193]

In 1989, RKO Pictures, which had produced no films while under Wesray control, was spun off yet again. Actress and Post Cereals heiress Dina Merrill and her husband, producer Ted Hartley, acquired a majority interest and merged the company with their Pavilion Communications. After a brief period as RKO/Pavilion, the business was reorganized as RKO Pictures LLC.[194] With the inaugural RKO production under Hartley and Merrill's ownership, False Identity (1990), the company also stepped into the distribution business. In 1992, it handled the well-regarded independent production Laws of Gravity, directed by Nick Gomez.[195] RKO's next significant release came in 1998 with Mighty Joe Young, a remake of a 1949 RKO movie that was itself something of a King Kong redux.[196] In the early 2000s, the company was involved as a coproducer on TV movies and modestly budgeted features at the rate of about one annually. In 2003, RKO coproduced a Broadway stage version of the 1936 Astaireâ ^Rogers vehicle Swing Time, under the title Never Gonna Dance.[197]

In 2003, as well, RKO Pictures entered into a legal battle with Wall Street Financial Associates (WSFA). Hartley and Merrill claimed that the owners of WSFA fraudulently induced them into signing an acquisition agreement by concealing their "cynical and rapacious" plans to purchase RKO with the intention only of dismantling it. WSFA sought a preliminary injunction prohibiting RKO's majority owners from selling their interests in the company to any third parties.[198] The WSFA motion was denied in July 2003, freeing RKO to deal with another potential purchaser, InternetStudios.com. In 2004, that planned sale fell through when InternetStudios.com apparently folded.[199] The company's minimal involvement in new film production continues to focus on its remake rights: Are We Done Yet?, based on Mr. Blandings Builds His Dream House

(1948), was released in April 2007 to dismal reviews.[200] Later in the year, RKO launched a horror division, Roseblood Movie Company. As of early 2010, Roseblood's mission had expanded, according to the RKO website, to encompass the "popular horror/thriller genre ... youth-oriented feature length motion pictures that are edgy, sensuous, scary and commercial." [201] The most recent RKO release is *Beyond a Reasonable Doubt* (2009), a remake of a 1956 RKO film directed by Fritz Lang.[202] A stage version of *Top Hat* toured Great Britain in the second half of 2011.[203]

[edit] Studio library

RKO Pictures LLC is the owner of all the trademarks and logos connected with RKO Radio Pictures Inc., as well as the rights concerning stories, screenplays (including 800 to 900 unproduced scripts), remakes, sequels, and prequels connected with the RKO library.[204] The television, video, and theatrical distribution rights, however, are in other hands: The U.S. and Canadian TV and, consequently, video rights to the bulk of the RKO film library were sold at auction in 1971 after the holders, TransBeacon (a corporate descendant of C&C Television), went bankrupt. The auctioned rights were split between United Artists and Marian B. Inc. (MBI). In 1984, MBI created a subsidiary, Marian Pictures Inc. (MBP), to which it transferred its share of the RKO rights. Two years later GenCorp's subsidiaries, RKO General and RKO Pictures, repurchased the rights then controlled by MBP.[205] In the meantime, United Artists had been acquired by MGM. In 1986, MGM/UA's considerable library, including its RKO rights, was bought by Turner Broadcasting for its new Turner Entertainment division. During RKO Pictures' brief Wesray episode, Turner acquired many of the distribution rights that had returned to RKO via MBP, as well as both the theatrical rights and the TV rights originally held back from C&C for the cities where RKO owned stations.[206]

In October 1996, Turner Broadcasting was merged into Time Warner, which controls and distributes the bulk of the RKO library today, though RKO Pictures retains the copyright.[207] As for RKO's primary release deals, the Disney pictures originally distributed by the studio are controlled by the Walt Disney Company. Rights to the Goldwyn features released by RKO, which had been held by the Samuel Goldwyn Company, are now controlled by MGM.[208]

International ownership of TV and video distribution rights to RKO's library is divided on a virtual country-by-country basis: In the UK, many of the RKO rights are currently held by Universal Studios.[209] In 1981, RAI, the public broadcasting service, acquired the Italian rights to the RKO library, which it now shares with Silvio Berlusconi's Fininvest.[210] In France, the rights are held by AriÃ's.[211] The German rights were acquired in 1969 by KirchGruppe on behalf of its KirchMedia division, which went bankrupt in 2002.[212] EOS Entertainment's Beta Film purchased many of KirchMedia's rights in 2004, and the library is now distributed by Kineos, created in 2005 as a Beta Film and KirchMedia joint venture.[213] In Australia and New Zealand they were held by Communications and Entertainment Limited (CEL) who failed for bankruptcy in 1999, and reverted to Magna Pacific. In Japan as of 2009 all the RKO films are in the public domain under Japanese copyright law and have been distributed through various distributors.

[edit] RKO Encino Ranch

RKO Radio Pictures' Encino, California, movie ranch consisted of 89 acres (360,000 m<sup>2</sup>) located on the outskirts of the City of Encino, California, in the San Fernando Valley, near Los Angeles River and west of Sepulveda Basin Recreation Area on Burbank Boulevard. RKO Radio Pictures purchased this property as a location to film their epic motion picture *Cimarron* (1931), (winner of four Academy Awards for Best Picture, Best Writing, Best Art Direction, and Best Make-Up). Art Director Max Ree won an Oscar for his creative design of the very first theme sets constructed on the movie ranch which consisted of a complete western town and a three block modern main street built as the Oklahoma (fictional) town of Osage.

In addition to *Cimarron* scenery, RKO continued to create a vast array of diverse sets for their ever expanding movie ranch that included a New York

avenue, brownstone street, English row houses, slum district, small town square, residential neighborhood, three working train depots, mansion estate, New England farm, western ranch, a mammoth medieval City of Paris, European marketplace, Russian village, Yukon mining camp, ocean tank with sky backdrop, Moorish casbah, Mexican outpost, Sahara Desert fort, plaster mountain range diorama, and a football field sized United States map on which Fred Astair and Ginger Rogers danced across in *The Story of Vernon and Irene Castle* (1939) (<http://www.retroweb.com/gallery/index.php?album=Studio%20Backlots/RKO%20Encino%20Ranch/Bison%20Archives>). Also available were scene docks, carpentry shop, prop storage, greenhouse, and three fully equipped soundstages with an average of over 11,000 square feet each.

A short list of classic movies that contain scenes shot on the RKO Pictures Ranch includes *What Price Hollywood?* (1932), *King Kong* (1933), *Of Human Bondage* (1934), *Becky Sharp* (1935), *Walking on Air* (1936), *Stage Door* (1937), *Kitty Foyle* (1940), *Citizen Kane* (1941), *Cat People* (1942), *Murder, My Sweet* (1944), *Dick Tracy* film noir series (1945-1947), and *They Live by Night* (1948) among others.

In 1953 *Dragnet* was the last project to film on RKO's movie ranch for an NBC 1954 broadcast of an episode entitled "The Big Producer" (<http://www.youtube.com/watch?v=rLE92cUlVGY>) in which the crumbling lot played the part of a fictitious "Westside Studio". Standing sets exhibited on this particular *Dragnet* program were a cocktail lounge on modern street, a ranch entry gate with a church and house facades ('*George Bailey*' wrecked his car there during a snow storm in *It's a Wonderful Life* 1946), plaster desert mountain range, ocean tank & sky backdrop used for *Sinbad the Sailor* (1947), *Notre Dame de Paris* Carre built for *The Hunchback of Notre Dame* (1939), and (the very first sets ever built on the ranch) the award winning western town from *Cimarron* (1931), (perhaps a tribute to the historic movie ranch from Jack Webb?).

After all those unique themed sets were bulldozed under in 1954, the 'Encino Village' subdivision was built on the property with modern home designs by architect Martin Stern, Jr.

[edit] In Popular Culture

In the last scenes of the movie version of the *Rocky Horror Picture Show*, the RKO Productions logo is in the background for Dr. Frank-N-Furter's floor show.

Most Radio Pictures Inc. and RKO Radio Pictures Inc. films produced between 1929 and 1957 have an opening logo displaying the studio's famous trademark, the spinning globe and radio tower, nicknamed the "Transmitter." It was inspired by a two-hundred-foot tower built in Colorado for a giant electrical amplifier, or Tesla coil, created by inventor Nikola Tesla.[214] Orson Welles referred to the design as his "favorite among the old logos, not just because it was so often a reliable portent. ... It reminds us to listen." [215] The studio's closing logo, a triangle enclosing a thunderbolt, was also a well-known trademark.[216] Instead of the Transmitter, many Disney films released by the studio originally appeared with colorful versions of the RKO closing logo as part of the main title sequence. For decades, re-releases of these films had Disney/Buena Vista logos replacing the RKO insignia, but the originals have been restored in many recent DVD editions.[217] The Hartleyâ ^Merrill RKO Pictures has created new versions of the Transmitter and the closing thunderbolt logo.

[edit] See also

^ The current online edition of *EncyclopÃ|dia Britannica* erroneously claims that RKO resulted "from the merger of the Radio Corporation of America, the Keith-Albee-Orpheum theatre chain, and the American PathÃ© production firm." See RKO Radio Pictures, Inc. entry. Retrieved 2010-05-03. Many other online resources make the same false claim or similar ones (e.g., that the RCA Photophone business was made part of RKO).

Note also the following:

Many sources incorrectly describe Keith-Albee-Orpheum as the union of three

theater chains; in fact the name describes the union of just two chains, B. F. Keith Corp. (doing business as Keith-Albee) and Orpheum Circuit Inc. Edward F. Albee was Benjamin F. Keith's right-hand man. He took over the company after the death of its founder, in 1914, and his son, A. Paul Keith, four years later.[218]

Many sources incorrectly give FBO's full name as "Film Booking Office of America"; the proper name is Film Booking Offices of America, which may be confirmed by examining its official logo.[219]

As an example of the many erroneous descriptions of RKO's early history that are routine even in reputable sources, take the summary history of the company's origins in *Grand Design: Hollywood as a Modern Business Enterprise, 1930-1939*, by Tino Balio (Berkeley, Los Angeles, and London: University of California Press, 1995 [1993]), p. 16. The following corrections must be made to a single paragraph:

FBO's full name was not "Film Booking Office" (see above).

RCA Photophone was not "amalgamated" with FBO and KAO under the Radio-Keith-Orpheum holding company.[220]

The company did not "contain" anything close to "three hundred theaters" (see note b, below).

Until its acquisition of Pathé in 1931, RKO did not "contain ... four studios" in either sense of the term "production company" (it "contained" one: FBO) or permanent production facility (it had, even by a generous count, three: FBO's Hollywood studio, the small New York studio FBO shared with Pathé, and the Encino backlot RKO established in 1929).

^ The reference in Jewell (1982) to "the 700 K-A-O Theatres in the US and Canada" (p. 10) is inaccurate. Time (1927) indicates that as of May 1927, Keith-Albee (legally the B. F. Keith Corp.) had 50 theaters and Orpheum had 47. Crafton (1997) claims KAO had "200 theaters" at the time of RKO's founding (p. 141), though he references no contemporary source. He does cite Film Daily in a description of RKO as controlling 250 theaters in 1930, following a "buying binge" (p. 256). Schatz (1998) describes an "RKO chain of 161 theaters" around the time David O. Selznick became production chief in October 1931 (p. 128). Schatz (1999) writes that as of 1940, RKO had "slightly more than 100 theaters" (p. 17). He explains that "the figures on studio-affiliated theaters vary considerably, owing to the number of houses in which the studios held only partial interest—as little as 5 percent in some cases" (p. 484, n. 24). A 1944 book, *Economic Control of the Motion Picture Industry*, includes the table "Theater holdings of the major companies are approximately as follows"—RKO is listed as holding 222 theaters.[221] Lasky (1989) indicates that a 1953 *Fortune* article tallied the RKO circuit in 1948, at the time of Hughes's purchase, at "124 theaters, plus a share in about 75 others" (p. 205).

^ The standard history and reference guide to the studio's films, *The RKO Story*, by Richard B. Jewell, with Vernon Harbin (New York: Arlington House/Crown, 1982) is used as the final arbiter of whether specific films made between 1929 and 1957 were RKO solo productions, coproductions, or completely independent productions. Official year of release is also per *The RKO Story*.

^ Only one previous sound film had cost more than \$1 million, and just barely: *Noah's Ark* (1929), from Warner Bros.[222]

^ For the switch to the RKO Radio Pictures brand at the beginning of the 1932-33 exhibition season for U.S. print advertising, see, e.g., this original poster for *The Most Dangerous Game*, which premiered September 9, 1932.[223]

^ Among still-ascendant male stars, Grant was preceded by the more established Fredric March as a freelancer. For other freelance Hollywood performers of the mid-1930s, see Balio (1995), p. 155.

^ By August 1940, the lease was no longer exclusive—see "Screen News Here and in Hollywood," *New York Times*, August 28, 1940. By mid-1949, Selznick had left the studio entirely—see two articles by Thomas F. Brady: "Republic to Make Film on Baseball," *New York Times*, April 8, 1949; and "Hollywood Buys More Stories," *New York Times*, May 1, 1949.

^ Schatz's (1999) brief description of Mr. and Mrs. Smith as a "critical and

commercial failure" (p. 89) is evidently incorrect. According to historian Leonard Leff, "Mr. and Mrs. Smith had a happy ending: good reviews and modest box office success." [224] Ed Sikov agrees, calling it a "solid commercial hit". [225] Donald Spoto's report on its release lends further support to this position. [226]

^ Citizen Kane lost \$150,000 to \$160,000 on original release (the production cost was precisely \$805,527.53); The Magnificent Ambersons lost \$624,000 (production cost \$1.125 million); and the unreleased It's All True cost the studio an estimated \$1.2 million. [227] Note that the studio operation itself was almost certainly a bigger money-loser than the cited figures suggest, with profits coming from the corporation's theatrical division. [228]

^ Jewell (1982) states that it "attracted \$3,355,000 in film rentals" (p. 181); Lasky (1989) refers to a Hollywood Reporter article on the film, published seven months after its premiere, predicting it "would do better than \$3 million in the U.S. alone" (p. 185). It is not listed in Schatz's (1999) appendix of annual top box-office films of the 1940s (p. 466), based on a 1992 Variety reckoning, perhaps because of its unusual production history. Assuming Jewell's figure is accurate, and the Schatz/Variety list is otherwise accurate and complete, Hitler's Children was the ninth biggest earner of 1943, a very impressive feat for a movie with a B budget and star (Tim Holt).

^ Many online sources give RKO General's year of inception as 1958, without evidence; O'Neill's 1959 dating is supported by the fact that there is no mention of RKO General in either the New York Times or the Los Angeles Times before February 1960.

#### [edit] References

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- ^ a b Goodwin (1987), pp. 375 to 379; Jewell (1982), pp. 9 to 10; Lasky (1989), pp. 25 to 27; Gomery (1985), pp. 63 to 65; Crafton (1997), pp. 136 to 139, 193 to 194.
- ^ "Cinemamerger", Time, May 2, 1927 (available online).
- ^ Lasky (1989), pp. 28 to 29.
- ^ a b Crafton (1997), p. 210.
- ^ "New Incorporations", New York Times, April 11, 1929.
- ^ Goodwin (1987), pp. 422 to 423; Jewell (1982), p. 32; Crafton (1997), pp. 208, 210.
- ^ Koszarski (2008), pp. 169 to 171; Barrios (1995), pp. 86 to 88.
- ^ Jewell (1982), p. 20; Lasky (1989), pp. 46 to 47; Barrios (1995), pp. 209, 226.
- ^ Lasky (1989), pp. 42 to 47; Barrios (1995), pp. 225 to 229.
- ^ Barrios (1995), p. 225.
- ^ Jewell (1982), p. 10.
- ^ Jewell (1982), pp. 20, 24.
- ^ Catalogue of Copyright Entries (1930), p. 369 et al.
- ^ Barrios (1995), p. 127; Lasky (1989), p. 52.
- ^ Bradley (1996), p. 260; "R.-K.-O. Signs More Noted Names", Los Angeles Times, June 20, 1929; "Studios Plan Huge Programs", Los Angeles Times, July 21, 1929.
- ^ Bradley (1996), p. 279.
- ^ Jewell (1982), pp. 38, 41. For Technicolor contracts during this era, see Kalmus, Herbert (October 28, 1938). "Technicolor Adventures in Cinemaland". Widescreen Museum. <http://www.widescreenmuseum.com/oldcolor/kalmus.htm>. Retrieved 2010-05-03.
- ^ Crafton (1997), p. 210; Barrier (2003), p. 169.
- ^ Crafton (1997), p. 552; Lasky (1989), p. 55.
- ^ Jewell (1982), p. 30.
- ^ Finler (2003), pp. 221, 223.
- ^ Finler (2003), p. 214.
- ^ Lasky (1989), p. 74.
- ^ Lasky (1989), pp. 58 to 59.
- ^ Jewell (1982), p. 44.

^ Lasky (1989), pp. 67â ^70.  
 ^ a b Bordwell et al. (1985), p. 321.  
 ^ Lasky (1989), pp. 74â ^76; Jewell (1982), p. 17.  
 ^ Lasky (1989), pp. 77â ^80, 93.  
 ^ Kroessler (2002), p. 219.  
 ^ Schatz (1998), pp. 131â ^33; Lasky (1989), pp. 81â ^82.  
 ^ Schatz (1998), p. 133; Lasky (1989), p. 83.  
 ^ Mueller (1986), p. 7.  
 ^ Schatz (1998), pp. 131.  
 ^ Lasky (1989), pp. 78â ^79, 93â ^95; Jewell (1982), pp. 52, 60.  
 ^ Lasky (1989), pp. 81â ^82.  
 ^ Finler (2003), p. 221.  
 ^ Lasky (1989), pp. 100â ^1.  
 ^ a b c d e Finler (2003), p. 219.  
 ^ Lasky (1989), pp. 98â ^99.  
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[edit] External links

RKO Radio Pictures history

RKO Pictures LLC

RKO Pictures the Hartleyâ ^Merrill company's website

Ted Hartley personal website of RKO Pictures LLC's chairman and CEO

"Newman Helms Doc" article by Michael Fleming on planned Hartley documentary,  
Variety.com, September 11, 2003

RKO library and logos

C&C RKO 16 mm Prints extensive discussion of RKO preservation and rights  
issues, by David Chierichetti; part of eFilmCenter website

The RKO Logo essay by Rick Mitchell; part of Hollywood: Lost and Found website

RKO Pictures Logos detailed descriptions by Nicholas Aczel and Sean Beard

Coordinates: 53°32′24″N 2°08′33″W﻿ / ﻿53.5462°N 2.1426°W﻿ / 53.5462; -2.1426

Chadderton (pop. 33,000) is a town within the Metropolitan Borough of Oldham, in Greater Manchester, England, historically a part of Lancashire. It lies along the course of the River Irk and the Rochdale Canal, on undulating land in the foothills of the Pennines, 1 mile (1.6 km) west of Oldham, 4.5 miles (7.2 km) south of Rochdale, and 6 miles (9.7 km) northeast of the city of Manchester.

During the Middle Ages, Chadderton was chiefly distinguished by its two mansions, Foxdenton Hall and Chadderton Hall, and by the prestigious families who occupied them. Its early history is marked by its status as a manorial township, with its own line of lords and overlords, who included the Asshetons, Chethams, Radclyffes, and Traffords. Farming was the main industry of the area, with locals supplementing their incomes by hand-loom woollen weaving in the domestic system.

Chadderton's urbanisation and expansion largely coincided with developments in textile manufacture during the Industrial Revolution and the Victorian era. A late 19th-century factory-building boom transformed Chadderton from a rural township into a major mill townâ ~one of several in its regionâ ~and the second most populous urban district in the United Kingdom. More than 50 cotton mills had been built in Chadderton by 1914.

Although Chadderton's industries declined during the mid-20th century, the town continued to grow as a result of suburbanisation and urban renewal. The legacy of the town's industrial past remains visible in its landscape of red-brick cotton mills, now used as warehouses or distribution centres. Some of these are listed buildings because of their architectural, historical, and cultural significance.[1][2]

[edit] History

[edit] Toponymy

The name Chadderton derives from Caderton, which is believed to be a combination of the Brythonic word Cader or Cater (modern Welsh: Caer), indicating a fortified place amongst the hills, and the Old English suffix -ton meaning a settlement.[3][4][5] The University of Nottingham's Institute for Name-Studies has offered a similar suggestion, that the name Chadderton means "farm or settlement at the hill called Cadeir".[6] This name is believed to date from the 7th century, when Angles colonised the region following the Battle of Chester.[7] It has been suggested that the Anglian settlers found a few Brythonic Celts already inhabiting what is now called Chadderton, and

borrowed their name for the hill, "Chadder", adding their own word for a settlement to the end.[8] Archaic spellings include Chaderthon, Chaderton, Chaterton, and Chatherton.[9] The first known written record of the name Chadderton is in a legal document relating to land tenure, in about 1220.[4]

#### [edit] Early history

The study of place names in Chadderton suggests that the ancient Britons once inhabited the area.[8] Remains of Roman roads have been discovered running through the town,[3][9] and the local road name Streetbridge suggests that the Romans once marched along it on a path which may have led to Blackstone Edge.[4][5] Relics found at a tumulus in Chadderton Fold date from the Early Middle Ages, probably from the early period of Anglo-Saxon England,[4][9] when Angles settled in the area and Chadderton emerged as a manor of the hundred of Salford.

Chadderton is not recorded in the Domesday Book of 1086. Its first appearance in a written record is in a legal document from around 1220, which states that Robert, Rector of Prestwich, gave land to Richard, son of Gilbert, in exchange for an annual fee of one silver penny.[4] Following the Norman conquest of England, Chadderton was made a constituent manor of the wider Royal Estate of Tottington, an extensive fee held by the Norman overlord, Roger de Montbegon.[3][10] Taxation and governance continued on this basis throughout the Middle Ages, with the Barons Montbegon of Hornby Castle holding the estate, until it passed to the Barons Lacy of Clitheroe Castle, and then onto local families.[3] In about 1235, the sub-manor of Chadderton and Foxdenton passed from Richard de Trafford of Trafford Park to Geoffrey de Trafford, who adopted the surname of Chadderton, thus founding the Chadderton family.[5] During the High Middle Ages, pieces of land in Chadderton were granted to religious orders and institutions, including Cockersand Abbey and the Knights Hospitaller.[4]

The manorial system was strong in Chadderton, and this lent distinction to the township,[3] in a region which otherwise had weak local lordship.[11] Throughout the Middle Ages, the manor of Chadderton constituted a township, centred on the hill by the banks of the River Irk, known as Chadderton Fold.[3] The fold consisted of a cluster of cottages centred around Chadderton Hall manor house, and a water-powered corn mill.[3] Chadderton Hall was owned and occupied by the de Chaddertons. Geoffrey de Chadderton became the Lord of the Manor of Tottington in the 13th century.[12][13] The de Chaddertons' involvement in regional and national affairs gave prestige to what was otherwise an obscure and rural township. William Chaderton was Bishop of Chester from 1579 to 1595 and held distinguished academic posts such as Lady Margaret's Professor of Divinity.[13][14] Laurence Chaderton was the first Master of Emmanuel College, Cambridge and among the first translators of the King James Version of the Bible.[13] Tottington was dissolved in the mid-15th century and there came a succession of distinguished families, each headed by an esquire with links to the monarchs of England. The Radclyffe, Assheton, and Horton families provided six High Sheriffs of Lancashire and a Governor of the Isle of Man.[13]

Apart from the dignitaries who lived in Chadderton's manor houses, Chadderton's population during the Middle Ages comprised a small community of retainers, most of whom were occupied in farming, either growing and milling of grain and cereal or raising cattle, sheep, pigs, and domestic fowl.[5] Workers supplemented their incomes by hand-loom spinning and weaving of wool at home.[3][5] The community was ravaged by an outbreak of the Black Death in 1349.[15]

#### [edit] Textiles and the Industrial Revolution

Until the mid-18th century, the region in and around Chadderton was dominated by dispersed agricultural settlements.[17] During this period the population was fewer than 1,000, broadly consisting of farmers who were involved with pasture, but who supplemented their incomes by working in cottage industries, particularly fustian and silk weaving.[5][18] A fulling mill at Chadderton by the River Irk was recorded during the Elizabethan era,[18] and during the Early Modern period the weavers of Chadderton had been using spinning wheels in

makeshift weavers' cottages to produce woollens. Primitive early 18th-century industrialisation developed slowly in Chadderton.[5] However, as the demand for cotton goods increased and the technology of cotton-spinning machinery improved during the mid-18th century, the need for larger structures to house bigger, better, and more efficient equipment became apparent. A water-powered cotton mill was built at Chadderton's Stock Brook in 1776.[12][19][20] The damp climate below the South Pennines provided ideal conditions for textile production to be carried out without the thread drying and breaking, and newly developed 19th-century mechanisation optimised cotton spinning for industrial-scale manufacture of yarn and fabric for the global market. As the Industrial Revolution advanced, socioeconomic conditions in the region contributed to Chadderton adopting cotton spinning in the factory system, which became the dominant source of employment in the locality.[18] The construction of multi-storey steam powered mills followed, which initiated a process of urbanisation and cultural transformation in the region; the population increasingly moved away from farming and domestic weaving in favour of the mechanised production of cotton goods.[11]

During this early period of change, Chadderton's parliamentary representation was limited to two Members of Parliament for Lancashire. Nationally, the end of the Napoleonic Wars in 1815 had resulted in periods of famine and unemployment for textile workers. Nevertheless, despite years of distress and unrest, major disturbances of machine-breaking did not occur until 1826. By the beginning of 1819 the pressure generated by poor economic conditions, coupled with the lack of suffrage in northern England, had enhanced the appeal of political Radicalism in the region. The Manchester Patriotic Union, a group agitating for parliamentary reform, began to organise a mass public demonstration in Manchester to demand the reform of parliamentary representation. Organised preparations took place, and a spy reported that in neighbouring Thornham, "seven hundred men drilled ... as well as any army regiment would".[23] A few days later, on 3<sup>rd</sup> August, a royal proclamation forbidding the practice of drilling was posted in Manchester.[24] On 16<sup>th</sup> August 1819, Chadderton (like its neighbours) sent a contingent of its townsfolk to Manchester to join the mass political demonstration now known as the Peterloo Massacre (owing to the 15 deaths and 400<sup>+</sup> 700 injuries which followed).[16][25] Two of the 15<sup>+</sup> deceased were from the area: John Ashton of Cowhill and Thomas Buckley of Baretrees.[26]

New markets in Europe and South America increased the demand for Britain's cheap cotton goods. Supplies of raw cotton were exported from plantations in the United States to Manchester.[27][28] From the markets in Manchester, mill owners from Chadderton and neighbouring towns bought their cotton to be processed into yarn and cloth. Supplies were cut during the Lancashire Cotton Famine of 1861<sup>-</sup>65 as a result of the American Civil War, leading to the formation of the Chadderton Local Board of Health in 1873, whose purpose was to ensure social security and maintain hygiene and sanitation in the locality following the crisis.[29] Despite a brief economic depression, the urban growth of Chadderton accelerated after the famine. The profitability of factory based cotton spinning meant that much of Chadderton's plentiful cheap open land, used for farming since antiquity, vanished under distinctive rectangular multi-storey brick-built factories<sup>~</sup>35 by 1891.[18] Chadderton's former villages and hamlets agglomerated as a mill town around these factories and a network of newly created roads, canals and railways.[19][30][31] The Chadderton landscape was "dominated by mill chimneys, many with the mill name picked out in white brick".[32] Neighbouring Oldham (which by the 1870s had emerged as the largest and most productive mill town in the world)[17][33] encroached upon Chadderton's eastern boundary, urbanising the town and surrounds,[34] and forming a continuous urban cotton-spinning district with Royton, Lees and Shaw and Crompton<sup>~</sup>the Oldham parliamentary constituency<sup>~</sup>which at its peak was responsible for 13<sup>+</sup> per<sup>+</sup> cent of the world's cotton production.[35] These Victorian era developments shifted the commercial focus away from Chadderton Fold to the major arterial Middleton Road, by Chadderton's eastern boundary with Oldham.[12][30] Sixty cotton mills were constructed in Chadderton between



1778 and 1926,[18] and 6,000 people, a quarter of Chadderton's population, worked in these factories by the beginning of the 20th century.[36] Industries ancillary to cotton spinning, such as engineering, coal mining, bleaching and dyeing became established during this period, meaning the rest of Chadderton's population were otherwise involved in the sector. Philip Stott was a Chadderton-born architect, civil engineer and surveyor of cotton mills. Stott's mills in Chadderton were some of the largest to be built in the United Kingdom, multiplying the town's industrial capacity and in turn increasing its population and productivity.[33]

The boomtown of Chadderton reached its industrial zenith in the 1910s, with over 50 cotton mills within the town limits.[19] A social consequence of this industrial growth was a densely populated metropolitan landscape, home to an extensive and enlarged working class community living in an urban sprawl of low quality terraced houses.[37] However, Chadderton developed an abundance of civic institutions including public street lighting, Carnegie library, public swimming baths, and council with its own town hall. The development of the town meant that the district council made initial steps to petition the Crown for honorific borough status for Chadderton in the 1930s.[12][29] However, the Great Depression, and the First and Second World Wars each contributed to periods of economic decline. As imports of cheaper foreign yarns and textile goods increased during the mid-20th century, Chadderton's textile sector declined to a halt; cotton spinning reduced dramatically in the 1960s and 1970s, and by 1997 only two mills were operational.[19] In spite of efforts to increase the efficiency and competitiveness of its production, the last cotton was spun in the town in 1998.[16][38] Many of the redundant mills have now been demolished. Non-textile based industries continued on throughout the 20th century and into the 21st century, particularly in the form of aircraft and chemical manufacture at plants in south Chadderton and Foxdenton respectively.[5]

[edit] Post-industrial history

During the second half of the 20th century, Chadderton experienced accelerated deindustrialisation along with economic decline.[19] Large areas of Victorian and Edwardian era terraced housing were identified as unsuited for modern needs, and were subsequently demolished.[39] However, the town's population continued to grow as a result of urban renewal and modern suburban housing developments.[5][40] During the 1970s and 1980s, redevelopment in the form of new shopping, health and leisure facilities contributed to the growth and renewal of Chadderton.[5][41] In 1990, the new Firwood Park, on the west side of Chadderton, was said to be the largest private housing estate in Europe.[41][42] Chadderton continued to be a regional hub for the secondary sector of the economy into the 21st century through BAE Systems and Zetex Semiconductors, though BAE Chadderton closed in March 2012.[38][43] Other major employers include The Stationery Office and Trinity Mirror.[5][38]

[edit] Governance

Lying within the historic county boundaries of Lancashire since the early 12th century, the boundaries of Chadderton have varied from time to time.[9] Chadderton anciently formed part of the hundred of Salford for civil jurisdiction, but for manorial government, Chadderton was a constituent manor of the Fee of Tottington, whose overlords were the de Lacys, Barons of Clitheroe Castle.[10] The de Chaddertons, Lords of the Manor of Chadderton, were accustomed to pay tax to the overlords until the division of Tottington.[10][46] In 1507, two constables were appointed to uphold law and order in Chadderton.[47] Following a court case, in 1713 it was agreed that 20 acres (8 ha) of Hollinwood be within Chadderton with the rest belonging to Oldham.[48]

Following the Poor Law Amendment Act 1834, Chadderton formed part of the Oldham Poor Law Union, an inter-parish unit established to provide social security. Chadderton's first local authority was a local board of health established in 1873; Chadderton Local Board of Health was a regulatory body responsible for standards of hygiene and sanitation in the township. Following

the Local Government Act 1894, the area of the local board became the Chadderton Urban District, a local government district within the administrative county of Lancashire.[48] The urban district council, comprising 18 members, would later be based out of Chadderton Town Hall, a purpose built municipal building opened in 1913.[45] In 1933, there were exchanges of land with the neighbouring Municipal Borough of Middleton and City of Manchester.[48]

Chadderton was the second most populous urban district in the United Kingdom by the 1930s, and the district council took initial steps to obtain municipal borough status, but this was not achieved. In 1926 and 1931, two Oldham Extension Bills for the County Borough of Oldham to amalgamate with Chadderton Urban District were rejected by the House of Lords, following objections from neighbouring councils.[29][49] A twinning arrangement was made in 1966 by Chadderton Urban District Council with Geesthacht, West Germany.[50] Under the Local Government Act 1972, the Chadderton Urban District was abolished, and Chadderton has, since 1 April 1974, formed an unparished area of the Metropolitan Borough of Oldham, a local government district of the metropolitan county of Greater Manchester.[4][12][48][51] Chadderton has three of the twenty wards of the Metropolitan Borough of Oldham: Chadderton North, Chadderton Central and Chadderton South.[52]

In terms of parliamentary representation, Chadderton after the Reform Act 1832 was represented as part of the Oldham parliamentary borough constituency, of which the first Members of Parliaments (MPs) were the radicals William Cobbett and John Fielden.[53] Winston Churchill was the MP between 1900 and 1906.[54] Constituency boundaries changed during the 20th century, and Chadderton has lain within the constituencies of Middleton and Prestwich (1918–1950) and Oldham West (1950–1997). Since 1997, Chadderton has lain within Oldham West and Royton. It is represented in the House of Commons by Michael Meacher, a member of the Labour Party.[55]

[edit] Geography

At 53°32′24″N 2°8′23″W﻿ / ﻿53.54611°N 2.1425°W﻿ / 53.54611; -2.1425 (53.54611; -2.1425), and 165 miles (266 km) north-northwest of central London, Chadderton lies at the foothills of the Pennines, 2.7 miles (4.3 km) east-southeast of Middleton, and 1.1 miles (1.8 km) west of Oldham. It is in the northeast part of the Greater Manchester Urban Area,[56][57] the UK's third largest conurbation, on undulating land rising from 300 feet (91 m) above sea level in the west to 450 feet (137 m) in the east. Chadderton Heights, on the hillier northern edge of the town, is its highest point at 509 feet (155 m).[9]

Chadderton's modern commercial centre lies close to the boundary with Oldham; the expansion of Oldham in the mid-19th century caused urbanisation along the eastern boundary of Chadderton, which spread outwards into the rest of the township.[34] Continued growth in the late-19th and early-20th centuries gave rise to a densely populated, industrial landscape of factories and rows of terraced housing, typical of mill towns in northern England.[5][9] There is a mixture of high-density urban areas, suburbs, and semi-rural locations in Chadderton, but overwhelmingly the land use in the town is urban. The soils of Chadderton are sand based, with subsoils of clay and gravel.[9]

Chadderton's built environment is distinguished by its former textile factories: "The huge flat-topped brick mills with their square towers and their tall circular chimneys dwarf all other buildings." [58] Rows of early-20th century terraced housing built to house Chadderton's factory workers are a common type of housing stock throughout the town; narrow streets pass through these older housing areas.[5]

Chadderton is contiguous with other settlements on all sides, including a shared boundary with the city of Manchester to the southwest.[3]

Localities within Chadderton include Baretrees, Block Lane, Busk, Butler Green, Chadderton Fold, Chadderton Park, Cowhill, Greengate, Firwood Park, Foxdenton, Healds Green, Middleton Junction, Mills Hill, Nimble Nook, Stock Brook and Whitegate.[9][12][16][59] Chadderton Fold, the former centrepiece of Chadderton, lies on the banks of the River Irk, 1.3 miles (2 km)

north-northwest of Chadderton's modern commercial centre. Hollinwood was formerly a village and industrial district of Chadderton, but was largely incorporated into neighbouring Oldham following a court case in 1713.[9]

[edit] Demography

Chadderton compared

2001 UK census

Chadderton[60]

Oldham (borough)[61]

England

Total population

33,001

217,273

49,138,831

White

94.4%

86.1%

90.9%

Asian

3.8%

11.9%

4.6%

Black

0.5%

0.6%

2.3%

According to the Office for National Statistics, at the time of the United Kingdom Census 2001, Chadderton (urban-core and sub-area) had a total resident population of 33,001.[62] The population density was 8,669 inhabitants per square mile (3,347<sup>Â</sup> /km<sup>2</sup>), with a 100 to 95.4 female-to-male ratio.[63] Of those over 16 years old, 27.2<sup>Â</sup> per<sup>Â</sup> cent were single (never married) 44.5<sup>Â</sup> per<sup>Â</sup> cent married, and 8.5<sup>Â</sup> per<sup>Â</sup> cent divorced.[64] Chadderton's 13,698 households included 28.8<sup>Â</sup> per<sup>Â</sup> cent one-person, 38.7<sup>Â</sup> per<sup>Â</sup> cent married couples living together, 8.9<sup>Â</sup> per<sup>Â</sup> cent co-habiting couples, and 10.3<sup>Â</sup> per<sup>Â</sup> cent single parents with their children.[65] Of those aged 16<sup>Â</sup> ^74, 35.6<sup>Â</sup> per<sup>Â</sup> cent had no academic qualifications.[66]

As of the 2001 UK census, 81.1<sup>Â</sup> per<sup>Â</sup> cent of Chadderton's residents reported themselves as being Christian, 3.2<sup>Â</sup> per<sup>Â</sup> cent Muslim, 0.5<sup>Â</sup> per<sup>Â</sup> cent Hindu, 0.1<sup>Â</sup> per<sup>Â</sup> cent Buddhist, and 0.1<sup>Â</sup> per<sup>Â</sup> cent Sikh. The census recorded 8.7<sup>Â</sup> per<sup>Â</sup> cent as having no religion, 0.1<sup>Â</sup> per<sup>Â</sup> cent had an alternative religion and 6.3<sup>Â</sup> per<sup>Â</sup> cent did not state their religion.[67]

Chadderton's population has been described as broadly working class with pockets of lower middle class communities, particularly in the northeast of the town, near the border with Royton.[68] Parts of the town are relatively affluent compared to the wider Metropolitan Borough of Oldham.[40]

Population growth in Chadderton since 1901

Year

1901

1911

1921

1931

1939

1951

1961

1971

1981

1991

2001

Population

24,892

28,299

28,721  
27,450  
30,571  
31,124  
32,568  
32,450  
33,518  
34,026  
33,001

Urban District 1901â ~1971[69] Â ~ Urban Subdivision 1981â ~2001[70][71][72]  
[edit] Economy

Up until the 18th century, the inhabitants of Chadderton raised domestic farm animals, supplementing their incomes by the spinning and weaving wool in the domestic system. Primitive coal mining was established by the 17th century, and the factory system adopted in the late-18th century.[5] During the Victorian era, Chadderton's economy was heavily dependent on manufacturing industries, especially the spinning of cotton, but also the weaving of silk and production of hats.[19][34] By the 20th century the landscape was covered with over 50 cotton mills.[5] Industries ancillary to these sectors, including coal mining, brick making, mechanical engineering, and bleaching and dyeing were present.[19] Chadderton developed an extensive coal mining sector auxiliary to Chadderton's cotton industry and workforce. Coal was transported out of the township via the Rochdale Canal. The amount of coal was overestimated however, and production began to decline even before that of the local spinning industry; Chadderton's last coal mine closed in 1920.[73]

Since the deindustrialisation of the region in the mid-20th century, these industries have been replaced by newer sectors and industries,[19] although many of the civic developments that accompanied industrialisation remain in the form of public buildings; a town hall, public baths and library.[5] The few surviving cotton mills are now occupied by warehousing and distribution companies, or used as space for light industry.[74]

British aircraft manufacturer Avro built a factory in south Chadderton in 1938â ~39.[19][75] It was one of the largest employers in the area, producing a variety of aircraft models including Ansons, Manchesters and Bristol Blenheims.[75] During the Second World War, 3,050 Avro Lancaster bombers were built at the Chadderton factoryâ ~over 40Â perÂ cent of the Royal Air Force's fleet.[19][76] After the Aircraft and Shipbuilding Industries Act 1977, Avro became part of the nationalised British Aerospace (now BAE Systems) and produced commercial aircraft for Boeing and Airbus.[77][78]

Chadderton has been described as a "relatively prosperous town [...] which makes it a popular residential area".[5] Chadderton Mall is a shopping precinct located in the town centre, and is one of Chadderton's main concentrations of retailing. It was constructed in 1974, and opened in 1975. It includes an Asda supermarket and a variety of smaller shops.[79]The Stationery Office has a base in Chadderton, as does 3M. In 2008, 3M was the centre of a high profile robbery of over 3,000 British passports.[80][81][82] Other major businesses include Costco and Shop Direct Group.[83] The Centre (formerly Elk Mill Retail Park),[84] is a retail park located at the start of the A627(M) motorway.[59]

[edit] Landmarks

Chadderton Town Hall was the seat of Chadderton Urban District Council. It is Chadderton's second town hall, the first was the former Chadderton Lyceum building (demolished in 1975). The current town hall, Chadderton's first purpose built municipal building, was designed by Taylor and Simister of Oldham, and was opened in 1913 by Herbert Wolstencroft JP, the then chairman of Chadderton Urban District Council. The architectural style was intended to have "a broad and strong treatment of the English Renaissance".[45] It features "charming gardens and a beautifully renovated ballroom".[85] Since 2007, Chadderton Town Hall has housed the Oldham Register Office, the civil registration authority for the Metropolitan Borough of Oldham.[86][87] It is a licensed venue for marriage ceremonies, and holds records of births, marriages

and deaths which have taken place in what is now the Metropolitan Borough of Oldham from 1837 to the present.[87]

Foxdenton Hall is a two-storey Georgian mansion and former manor house, with an English garden wall bond exterior and its own private gardens.[88] The original Hall was erected in the mid-15th century as a home for the Radclyffes, who had acquired the title of joint Lords of the Manor with the Asshetons of Chadderton, through marriage. This Foxdenton Hall was demolished to make way for a second Hall, built in 1620. The ground floor of that second Hall now forms the basement of the present Hall, built in 1700.[89] The building is described as "a dignified early Georgian house, particularly rare in this part of the country".[88] The Radclyffes moved out of Foxdenton Hall in the late 18th century, favouring properties they had purchased in Dorset, although they still maintained ownership.[89] Foxdenton Hall and the adjoining Foxdenton Park were leased to Chadderton Council by the Radclyffes in 1922, when they opened to the public. In 1960 the council took over ownership of the Hall, by which time it was in a state of disrepair. Following protest about funding and the condition of the building, Foxdenton Hall was restored in 1965.[90]

Chadderton War Memorial is located outside Chadderton Town Hall, and was originally erected "in honour of the men of Chadderton who made the supreme sacrifice and in grateful remembrance of all who served their county" during the First World War, but later, the Second World War. It is a granite obelisk fronted by three steps. At the front on a short plinth stands a bronze figure of an ordinary soldier, holding a rifle in his right hand. It was designed by Taylor and Simister and sculpted by Albert Toft. Chadderton War Memorial was commissioned by the Chadderton War Memorial Committee and unveiled on 8 October 1921 by Councillor Ernest Kempsey.[91]

Chadderton Hall Park is a public park by the River Irk in the north of Chadderton, spanning an area of over 15 acres (6Â ha),[92] in what were once the gardens of the manorial Chadderton Hall. At the end of the 19th century they were leased to Joseph Ball, who transformed the hall and grounds into a pleasure garden, complete with a boating lake and a menagerie.[93] The hall was demolished in 1939. The park is now owned by Oldham Council, the local authority, and was opened to the public in 1956. It was awarded Green Flag status in 2006.[92][94]

[edit] Transport

Public transport in Chadderton is co-ordinated by Transport for Greater Manchester (TfGM), a county-wide public body with direct operational responsibilities such as supporting (and in some cases running) local bus services, and managing integrated ticketing in Greater Manchester. Major A roads link Chadderton with other settlements, including the A663 road. Opened by Wilfrid William Ashley, 1st Baron Mount Temple in 1925, the arterial A663, named Broadway, bisects Chadderton from north to south, and was "a major factor in the unification and modernisation of the town".[19] The A669 road, routed through Chadderton, connects Oldham with Middleton. At its eastern end is Chadderton's town centre. The M62 motorway runs to the north of the area and is accessed via Broadway at junction 21 and junction 20 via the A627(M) motorway, which terminates close to Chadderton's northeastern boundary with Royton.[59] The M60 motorway skirts the south of Chadderton, near Hollinwood.[5] The section of the M60 through Chadderton was opened in autumn 2000.[95]

Chadderton is served by two railway stations just outside its western boundary, Mills Hill railway station at its border with Middleton and Moston railway station at its border with New Moston, Manchester.

The Middleton Junction and Oldham Branch Railway was routed through Chadderton. Middleton Junction railway station was within the town limits. Opened on 31 March 1842 it closed in 1966. On 12 August 1914 Chadderton goods and coal depot was opened. The depot was at the end of a 1097 yards long branch which came off the Middleton Junction to Oldham line at Chadderton Junction.[96] The line from Chadderton Junction to Oldham Werneth was closed on 7 January 1963, but Chadderton goods and coal depot remained open for a period.[97] Electric tramways to and from Middleton opened in 1902. Tram

services ran along Middleton Road and terminated in Chadderton. The final tram ran in 1935.[98] The Oldham Loop Line closed as a heavy rail line in 2009, and reopened in June 2012 as part of a new Manchester Metrolink light-rail line from Manchester Victoria to Rochdale via Oldham. South Chadderton Metrolink station, Freehold Metrolink station and the former Hollinwood railway station are part of the conversion to Metrolink.[99][100]

The majority of the bus services in Chadderton are operated by First Greater Manchester, who run services 24, 58, 59, 181, 182 and 419, which provide frequent services from Chadderton town centre to Middleton, Oldham and Shaw, with other services running to Ashton-under-Lyne, Manchester, Royton and Rochdale. Service 415 links the Cowhill and Nimble Nook areas of Chadderton with Middleton and Oldham, while services 81 and 81a operate through South Chadderton providing services to Manchester via Moston and to Oldham, Holts and Derker. Service 149 also links South Chadderton with Oldham and to Manchester via Blackley. Bluebird run services 152 and 159 in Chadderton and provide links to Failsworth, Hollinwood, Middleton, Moston, New Moston and Woodhouses.[59]Citibus was a Chadderton-based commercial bus operator serving Greater Manchester, launched in 1986. It competed with GMPTE until 1995 when it was bought-out by GM Buses North, what is now First Manchester.[101]

[edit] Education

An old style grammar school at Healds Green in Chadderton was built and founded in 1789.[102] As the population of Chadderton grew during the 19th century, more schools were opened, each linked with a local church.[34] Mills Hill School began as a voluntary aided school belonging to the local Baptist church.[102] Further schoolrooms from this period were found at Cowhill Methodist Church and Washbrook Methodist Church, opened in 1855 and 1893 respectively.[103]

The Chadderton Grammar School was the first new style co-educational grammar school opened by Lancashire County Council. It was opened by David Lindsay, 28th Earl of Crawford, on 18<sup>th</sup> October 1930. In 1959, it became The Girls' Grammar, when a separate school for boys was opened. The Girls' Grammar briefly became Mid-Chadderton School, what is now The Radclyffe School, and the boys' school part of North Chadderton School.[102][104] Radclyffe and North Chadderton are today the town's two co-educational, non-denominational, comprehensive secondary schools.[5] North Chadderton School has a sixth form college for 16<sup>th</sup> ^19 year-olds. The Radclyffe School, which has specialist Technology College status, was modernised in 2008 by way of a £30<sup>th</sup> million new school complex opened by Sir Alex Ferguson on 8<sup>th</sup> July 2008.[105]

[edit] Religion

Chadderton had no medieval church of its own,[106] and until 1541, for ecclesiastical purposes, lay within the parish of Prestwich-cum-Oldham in the Diocese of Lichfield. The diocese was then divided, and Chadderton became part of the Diocese of Chester.[16] This in turn was divided in 1847, when the present Diocese of Manchester was created. For ritual baptisms, marriages and burials, the people of Chadderton, a Christian community, had to travel to churches that lay outside of the township's boundaries, including Oldham St Mary's, Middleton St Leonard's, and Prestwich St Mary's. The route of some of the ancient paths to these churches is preserved in the modern layout of some of the town's roads.[107]

The New Parishes Act 1844 allowed for the creation of a parish for Chadderton, dedicated to St Matthew the Evangelist. Services were initially held in the stables of Chadderton Hall, and then in a temporary wooden structure opened in 1848.[108][109] The Church of St Matthew was opened for the parish in 1857 by the then Bishop of Manchester, James Prince Lee.[108][109] A steeple was added in 1881.[108] Following the construction of this church, four followed. There are now several Anglican parishes, and within them daughter and mission churches, serving the town.[106] The parish of St Matthew united with the neighbouring parish of St Luke, and the United Benefice of St Matthew with St Luke now lies within the Tandle Deanery of the Diocese of Manchester.[110] Also within this deanery is the Parish Church of St Mark, built in the early<sup>th</sup> 1960s.

It is a blue brick building with a graduated slate pitched roof, and a rectangular brick steeple with a high gabled roof.[111] It was granted Grade II listed building status in 1998.[111]

In addition to the Church of England, a variety of Reformed denominations have been practiced in Chadderton. Nonconformism was popular in Chadderton, and places of worship for Methodism, Baptist and Congregationalism were built during the 19th and 20th centuries.[106] Washbrook Methodist Church and School at Butler Green was built in 1868, but was demolished around 1970.[112]

Chadderton forms part of the Roman Catholic Diocese of Salford. The Roman Catholic Parish of Corpus Christi was founded in Chadderton in 1878, following immigration to the region by Irish Catholics fleeing the Great Famine. A combined school and church was opened in 1904.[113] A further Catholic parish for Chadderton, dedicated to Saint Herbert, was created in 1916.[113] Its first mass was held on 1 July 1916, the day the Battle of the Somme began.[113]

[edit] Sports

Chadderton F.C. is an association football club formed in 1947 under the name Millbrow Football Club, later changing to North Chadderton Amateurs, before adopting its present name in 1957.[114] It plays in the North West Counties Football League First Division. Past players have included former England national football team captain David Platt, former Leeds United A.F.C. and Crystal Palace F.C. player John Pemberton and Northern Ireland national football team player Steve Jones.[114] Mark Owen of pop group Take That briefly played for the club.[114] Chaddertonians A.F.C. were formed in 1937 and currently play in the Lancashire Amateur League.[115] Chadderton Park F.C. is an amateur football club founded in 1977.[116]

The Art Nouveau Chadderton Baths was a public swimming facility opened in 1937.[5] Henry Taylor, the British Olympic freestyle swimming triple gold medallist and champion was an attendant at Chadderton Baths where many of his awards were displayed.[117][118] Chadderton Baths were closed indefinitely in 2006 after a structural survey found faults which could have put the public at risk.[119] Chadderton Sports Centre, built onto the Baths, was closed and replaced by the Chadderton Wellbeing Centre in January 2010. An application to demolish the Baths was made in March 2011.[120] The Wellbeing Centre is a multi-purpose facility with a swimming pool, dance studio, library, gym, meeting rooms, and café.[121]

[edit] Public services

Policing in Chadderton is provided by the Greater Manchester Police. The force's "(Q) Division" has its headquarters for policing the Metropolitan Borough of Oldham in central Oldham. Greater Manchester Police have two stations in Chadderton: a Victorian building in central Chadderton, and a modern purpose-built station at Broadgate in southern Chadderton.[122][123] Statutory emergency fire and rescue service is provided by the Greater Manchester Fire and Rescue Service, who have a fire station in Chadderton, on Broadway.[124]

There are no hospitals in Chadderton – the nearest are in the larger settlements of Oldham and Rochdale – but some local health care is provided by Chadderton Town and South Chadderton health centres which are commissioned by NHS Oldham. The North West Ambulance Service provides emergency patient transport in the area. Other forms of health care are provided for locally by several small specialist clinics and surgeries.

Waste management is co-ordinated by the local authority via the Greater Manchester Waste Disposal Authority.[125] Locally produced inert waste for disposal is sent to landfill at the Beal Valley.[126] United Utilities manages Chadderton's drinking and waste water.[127] Water supplies are sourced from several reservoirs in the borough, including Dovestones and Chew.[128] A sewage treatment works is located in the southwest of Chadderton, at Foxdenton. It opened in 1898.[5]

A power station in Chadderton existed as early as 1925, built for the County Borough of Oldham in the Slacks Valley.[129] This structure was demolished to make way for the new Chadderton "B" Power Station, opened in 1955

for the British Electricity Authority in anticipation that the region would experience increased demand for electricity.[130][131] Structural changes to the National Grid made the power station redundant in 1982.[132] It was sold by the Central Electricity Generating Board in 1984, and demolished in 1986.[129][133] Chadderton's Distribution Network Operator for electricity is United Utilities.[127]

[edit] Notable people

People from Chadderton are called Chaddertonians. Historically, Chadderton was chiefly distinguished by the presence of ruling families, including the Asshetons, Radclyffes, Hortons and Chaddertons. Within the extended Chadderton/Chaderton family, two ecclesiastically notable persons were William Chaderton (medieval academic and bishop) and Laurence Chaderton (one of the original translators of the Authorised King James Version of the Bible).[13] John Ashton of Cowhill and Thomas Buckley of Baretrees in Chadderton were two victims of the Peterloo Massacre in 1819.[9][19] Lydia Becker was a leader within Britain's 19th-century suffragette movement, born in Chadderton's Foxdenton Hall.[76] Chadderton born scientist Geoff Tootill helped create the Manchester Small-Scale Experimental Machine in 1948, the world's first electronic stored-program computer.[134] Terry Hall was a pioneering ventriloquist and early children's television entertainer born in Chadderton in 1926.[135][136] He was one of the first ventriloquists to perform with an animal (the "cowardly and bashful" Lenny the Lion) as his puppet, rather than a traditional child doll.[135][136] Other notable people from Chadderton include Woolly Wolstenholme, the Chadderton-born vocalist and keyboard player with the British progressive rock band Barclay James Harvest,[137] David Platt, former captain of the England national football team,[138][139][140] and supermodel Karen Elson, who grew up in the town and attended North Chadderton School.[141][142][143] Professor Brian Cox was born in Chadderton in 1968. William Ash, is a Chadderton-born actor who has appeared in productions such as Waterloo Road and Hush.[144]

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[edit] External links

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; Jörg 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 Göttingen 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]

â

[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 ForÃ¢t de Vohidrazana near the village of Fanovana, approximately 12Â 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. Catherine's 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 3 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 2 subspecies).[62] The third edition went on to recognize 101 lemur taxa (97 species and 4 subspecies) and suggested that future research could reveal as many as 110 to 125 taxa.[18]

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A globular cluster is a spherical collection of stars that orbits a galactic core as a satellite. Globular clusters are very tightly bound by gravity, which gives them their spherical shapes and relatively high stellar densities toward their centers. The name of this category of star cluster is derived from the Latin *globulus* ~a small sphere. A globular cluster is sometimes known more simply as a globular.

Globular clusters, which are found in the halo of a galaxy, contain considerably more stars and are much older than the less dense galactic, or open clusters, which are found in the disk. Globular clusters are fairly common; there are about 150[2] to 158[3] currently known globular clusters in the Milky Way, with perhaps 10 to 20 more still undiscovered.[4] Large galaxies can have more: Andromeda, for instance, may have as many as 500.[5] Some giant elliptical galaxies, particularly those at the centers of galaxy clusters, such as M87,[6] have as many as 13,000 globular clusters. These globular clusters orbit the galaxy out to large radii, 40 kiloparsecs (approximately 131,000 light-years) or more.[7]

Every galaxy of sufficient mass in the Local Group has an associated group of globular clusters, and almost every large galaxy surveyed has been found to possess a system of globular clusters.[8] The Sagittarius Dwarf and Canis Major Dwarf galaxies appear to be in the process of donating their associated globular clusters (such as Palomar 12) to the Milky Way.[9] This demonstrates how many of this galaxy's globular clusters might have been acquired in the past.

Although it appears that globular clusters contain some of the first stars to be produced in the galaxy, their origins and their role in galactic evolution are still unclear. It does appear clear that globular clusters are significantly different from dwarf elliptical galaxies and were formed as part of the star formation of the parent galaxy rather than as a separate galaxy.[10] However, recent conjectures by astronomers suggest that globular clusters and dwarf spheroidals may not be clearly separate and distinct types of objects.[11]

#### [edit] Observation history

The first globular cluster discovered was M22 in 1665 by Abraham Ihle, a German amateur astronomer.[12] However, given the small aperture of early telescopes, individual stars within a globular cluster were not resolved until Charles Messier observed M4.[13] The first eight globular clusters discovered are shown in the table. Subsequently, Abbé Lacaille would list NGC 104, NGC 4833, M55, M69, and NGC 6397 in his 1751 <sup>52</sup> catalogue. The M before a number refers to the catalogue of Charles Messier, while NGC is from the New General Catalogue by John Dreyer.

William Herschel began a survey program in 1782 using larger telescopes and was able to resolve the stars in all 33 of the known globular clusters. In addition he found 37 additional clusters. In Herschel's 1789 catalog of deep sky objects, his second such, he became the first to use the name globular cluster as their description.[13]

The number of globular clusters discovered continued to increase, reaching 83 in 1915, 93 in 1930 and 97 by 1947. A total of 152 globular clusters have now been discovered in the Milky Way galaxy, out of an estimated total of  $180 \pm 20$ . [4] These additional, undiscovered globular clusters are believed to be hidden behind the gas and dust of the Milky Way.

Beginning in 1914, Harlow Shapley began a series of studies of globular clusters, published in about 40 scientific papers. He examined the RR Lyrae variables in the clusters (which he assumed were cepheid variables) and would use their period<sup>luminosity</sup> relationship for distance estimates. Later, it was found that RR Lyrae variables are fainter than cepheid variables, which caused Shapley to overestimate the distance to the clusters.[14]

Of the globular clusters within our Milky Way, the majority are found in the vicinity of the galactic core, and the large majority lie on the side of the celestial sky centered on the core. In 1918 this strongly asymmetrical

distribution was used by Harlow Shapley to make a determination of the overall dimensions of the galaxy. By assuming a roughly spherical distribution of globular clusters around the galaxy's center, he used the positions of the clusters to estimate the position of the sun relative to the galactic center.[15] While his distance estimate was significantly in error, it did demonstrate that the dimensions of the galaxy were much greater than had been previously thought. His error was because dust in the Milky Way diminished the amount of light from a globular cluster that reached the earth, thus making it appear farther away. Shapley's estimate was, however, within the same order of magnitude as the currently accepted value.

Shapley's measurements also indicated that the Sun was relatively far from the center of the galaxy, contrary to what had previously been inferred from the apparently nearly even distribution of ordinary stars. In reality, ordinary stars lie within the galaxy's disk and are thus often obscured by gas and dust, whereas globular clusters lie outside the disk and can be seen at much further distances.

Shapley was subsequently assisted in his studies of clusters by Henrietta Swope and Helen Battles Sawyer (later Hogg). In 1927<sup>29</sup>, Harlow Shapley and Helen Sawyer began categorizing clusters according to the degree of concentration the system has toward the core. The most concentrated clusters were identified as Class I, with successively diminishing concentrations ranging to Class XII. This became known as the Shapley<sup>30</sup> Sawyer Concentration Class. (It is sometimes given with numbers [Class I<sup>12</sup>] rather than Roman numerals.)[16]

[edit] Formation

At present, the formation of globular clusters remains a poorly understood phenomenon, and it remains uncertain whether the stars in a globular cluster form in a single generation, or are spawned across multiple generations over a period of several hundred million years. In many globular clusters, most of the stars are at approximately the same stage in stellar evolution, suggesting that they formed at about the same time.[18] However, the star formation history varies from cluster to cluster, with some clusters showing distinct populations of stars. An example of this is the globular clusters in the Large Magellanic Cloud (LMC) that exhibit a bimodal population. During their youth, these LMC clusters may have encountered giant molecular clouds that triggered a second round of star formation.[19] This star-forming period is relatively brief, compared to the age of many globular clusters.[20]

Observations of globular clusters show that these stellar formations arise primarily in regions of efficient star formation, and where the interstellar medium is at a higher density than in normal star-forming regions. Globular cluster formation is prevalent in starburst regions and in interacting galaxies.[21] Research indicates a correlation between the mass of a central supermassive black holes (SMBH) and the extent of the globular cluster systems of elliptical and lenticular galaxies. The mass of the SMBH in such a galaxy is often close to the combined mass of the galaxy's globular clusters.[22]

No known globular clusters display active star formation, which is consistent with the view that globular clusters are typically the oldest objects in the Galaxy, and were among the first collections of stars to form. Very large regions of star formation known as super star clusters, such as Westerlund 1 in the Milky Way, may be the precursors of globular clusters.[23]

[edit] Composition

Globular clusters are generally composed of hundreds of thousands of low-metal, old stars. The type of stars found in a globular cluster are similar to those in the bulge of a spiral galaxy but confined to a volume of only a few million cubic parsecs. They are free of gas and dust and it is presumed that all of the gas and dust was long ago turned into stars.

Globular clusters can contain a high density of stars; on average about 0.4 stars per cubic parsec, increasing to 100 or 1000 stars per cubic parsec in the core of the cluster.[25] The typical distance between stars in a globular cluster is about 1 light year,[26] but at its core, the separation is

comparable to the size of the Solar System (100 to 1000 times closer than stars near the Solar System).[27]

However, they are not thought to be favorable locations for the survival of planetary systems. Planetary orbits are dynamically unstable within the cores of dense clusters because of the perturbations of passing stars. A planet orbiting at 1 astronomical unit around a star that is within the core of a dense cluster such as 47 Tucanae would only survive on the order of 108 years.[28] There is a planetary system orbiting a pulsar (PSR B1620-6) that belongs to the globular cluster M4, but these planets likely formed after the event that created the pulsar.[29]

Some globular clusters, like Omega Centauri in our Milky Way and G1 in M31, are extraordinarily massive, with several million solar masses and multiple stellar populations. Both can be regarded as evidence that supermassive globular clusters are in fact the cores of dwarf galaxies that are consumed by the larger galaxies.[30] About a quarter of the globular cluster population in the Milky Way may have been accreted along with their host dwarf galaxy.[31]

Several globular clusters (like M15) have extremely massive cores which may harbor black holes,[32] although simulations suggest that a less massive black hole or central concentration of neutron stars or massive white dwarfs explain observations equally well.

[edit] Metallic content

Globular clusters normally consist of Population II stars, which have a low proportion of elements other than hydrogen and helium when compared to Population I stars such as the Sun. Astronomers refer to these heavier elements as metals and to the proportions of these elements as the metallicity. These elements are produced by stellar nucleosynthesis and then are recycled into the interstellar medium, where they enter the next generation of stars. Hence the proportion of metals can be an indication of the age of a star, with older stars typically having a lower metallicity.[34]

The Dutch astronomer Pieter Oosterhoff noticed that there appear to be two populations of globular clusters, which became known as Oosterhoff groups. The second group has a slightly longer period of RR Lyrae variable stars.[35] Both groups have weak lines of metallic elements. But the lines in the stars of Oosterhoff type I (OoI) cluster are not quite as weak as those in type II (OoII).[35] Hence type I are referred to as "metal-rich" while type II are "metal-poor".

These two populations have been observed in many galaxies, especially massive elliptical galaxies. Both groups are nearly as old as the universe itself and are of similar ages, but differ in their metal abundances. Many scenarios have been suggested to explain these subpopulations, including violent gas-rich galaxy mergers, the accretion of dwarf galaxies, and multiple phases of star formation in a single galaxy. In our Milky Way, the metal-poor clusters are associated with the halo and the metal-rich clusters with the bulge.[36]

In the Milky Way it has been discovered that the large majority of the low metallicity clusters are aligned along a plane in the outer part of the galaxy's halo. This result argues in favor of the view that type II clusters in the galaxy were captured from a satellite galaxy, rather than being the oldest members of the Milky Way's globular cluster system as had been previously thought. The difference between the two cluster types would then be explained by a time delay between when the two galaxies formed their cluster systems.[37]

[edit] Exotic components

Globular clusters have a very high star density, and therefore close interactions and near-collisions of stars occur relatively often. Due to these chance encounters, some exotic classes of stars, such as blue stragglers, millisecond pulsars and low-mass X-ray binaries, are much more common in globular clusters. A blue straggler is formed from the merger of two stars, possibly as a result of an encounter with a binary system.[38] The resulting star has a higher temperature than comparable stars in the cluster with the same luminosity, and thus differs from the main sequence stars formed at the beginning of the cluster.[39]



Astronomers have searched for black holes within globular clusters since the 1970s. The resolution requirements for this task, however, are exacting, and it is only with the Hubble space telescope that the first confirmed discoveries have been made. In independent programs, a 4,000 solar mass intermediate-mass black hole has been suggested to exist based on HST observations in the globular cluster M15 and a 20,000 solar mass black hole in the Mayall II cluster in the Andromeda Galaxy.[40] Both x-ray and radio emissions from Mayall II appear to be consistent with an intermediate-mass black hole.[41]

These are of particular interest because they are the first black holes discovered that were intermediate in mass between the conventional stellar-mass black hole and the supermassive black holes discovered at the cores of galaxies. The mass of these intermediate mass black holes is proportional to the mass of the clusters, following a pattern previously discovered between supermassive black holes and their surrounding galaxies.

Claims of intermediate mass black holes have been met with some skepticism. The densest objects in globular clusters are expected to migrate to the cluster center due to mass segregation. These will be white dwarfs and neutron stars in an old stellar population like a globular cluster. As pointed out in two papers by Holger Baumgardt and collaborators, the mass-to-light ratio should rise sharply towards the center of the cluster, even without a black hole, in both M15[42] and Mayall II.[43]

[edit] Color-magnitude diagram

The Hertzsprung-Russell diagram (HR-diagram) is a graph of a large sample of stars that plots their visual absolute magnitude against their color index. The color index,  $B - V$ , is the difference between the magnitude of the star in blue light, or B, and the magnitude in visual light (green-yellow), or V. Large positive values indicate a red star with a cool surface temperature, while negative values imply a blue star with a hotter surface.

When the stars near the Sun are plotted on an HR diagram, it displays a distribution of stars of various masses, ages, and compositions. Many of the stars lie relatively close to a sloping curve with increasing absolute magnitude as the stars are hotter, known as main-sequence stars. However the diagram also typically includes stars that are in later stages of their evolution and have wandered away from this main-sequence curve.

As all the stars of a globular cluster are at approximately the same distance from us, their absolute magnitudes differ from their visual magnitude by about the same amount. The main-sequence stars in the globular cluster will fall along a line that is believed to be comparable to similar stars in the solar neighborhood. The accuracy of this assumption is confirmed by comparable results obtained by comparing the magnitudes of nearby short-period variables, such as RR Lyrae stars and cepheid variables, with those in the cluster.[44]

By matching up these curves on the HR diagram the absolute magnitude of main-sequence stars in the cluster can also be determined. This in turn provides a distance estimate to the cluster, based on the visual magnitude of the stars. The difference between the relative and absolute magnitude, the distance modulus, yields this estimate of the distance.[45]

When the stars of a particular globular cluster are plotted on an HR diagram, in many cases nearly all of the stars fall upon a relatively well defined curve. This differs from the HR diagram of stars near the Sun, which lumps together stars of differing ages and origins. The shape of the curve for a globular cluster is characteristic of a grouping of stars that were formed at approximately the same time and from the same materials, differing only in their initial mass. As the position of each star in the HR diagram varies with age, the shape of the curve for a globular cluster can be used to measure the overall age of the star population.[46]

The most massive main-sequence stars will also have the highest absolute magnitude, and these will be the first to evolve into the giant star stage. As the cluster ages, stars of successively lower masses will also enter the giant star stage. Thus the age of a single population cluster can be measured by looking for the stars that are just beginning to enter the giant star stage.

This forms a "knee" in the HR diagram, bending to the upper right from the main-sequence line. The absolute magnitude at this bend is directly a function of the age of globular cluster, so an age scale can be plotted on an axis parallel to the magnitude.

In addition, globular clusters can be dated by looking at the temperatures of the coolest white dwarfs. Typical results for globular clusters are that they may be as old as 12.7 billion years.[47] This is in contrast to open clusters which are only tens of millions of years old.

The ages of globular clusters place a bound on the age limit of the entire universe. This lower limit has been a significant constraint in cosmology. During the early 1990s, astronomers were faced with age estimates of globular clusters that appeared older than cosmological models would allow. However, better measurements of cosmological parameters through deep sky surveys and satellites such as COBE have resolved this issue as have computer models of stellar evolution that have different models of mixing.

Evolutionary studies of globular clusters can also be used to determine changes due to the starting composition of the gas and dust that formed the cluster. That is, the evolutionary tracks change with changes in the abundance of heavy elements. The data obtained from studies of globular clusters are then used to study the evolution of the Milky Way as a whole.[48]

In globular clusters a few stars known as blue stragglers are observed, apparently continuing the main sequence in the direction of brighter, bluer stars. The origins of these stars is still unclear, but most models suggest that these stars are the result of mass transfer in multiple star systems.[49]

[edit] Morphology

In contrast to open clusters, most globular clusters remain gravitationally bound for time periods comparable to the life spans of the majority of their stars. However, a possible exception is when strong tidal interactions with other large masses result in the dispersal of the stars.

After they are formed, the stars in the globular cluster begin to interact gravitationally with each other. As a result the velocity vectors of the stars are steadily modified, and the stars lose any history of their original velocity. The characteristic interval for this to occur is the relaxation time. This is related to the characteristic length of time a star needs to cross the cluster as well as the number of stellar masses in the system.[50] The value of the relaxation time varies by cluster, but the mean value is on the order of 109 years.

Ellipticity of Globulars

Galaxy

Ellipticity[51]

Milky Way

$0.07 \pm 0.04$

LMC

$0.16 \pm 0.05$

SMC

$0.19 \pm 0.06$

M31

$0.09 \pm 0.04$

Although globular clusters generally appear spherical in form, ellipticities can occur due to tidal interactions. Clusters within the Milky Way and the Andromeda Galaxy are typically oblate spheroids in shape, while those in the Large Magellanic Cloud are more elliptical.[52]

Astronomers characterize the morphology of a globular cluster by means of standard radii. These are the core radius ( $r_c$ ), the half-light radius ( $r_h$ ) and the tidal radius ( $r_t$ ). The overall luminosity of the cluster steadily decreases with distance from the core, and the core radius is the distance at which the apparent surface luminosity has dropped by half. A comparable quantity is the half-light radius, or the distance from the core within which half the total luminosity from the cluster is received. This is typically larger than the core radius.

Note that the half-light radius includes stars in the outer part of the cluster that happen to lie along the line of sight, so theorists will also use the half-mass radius ( $r_m$ ) ~ the radius from the core that contains half the total mass of the cluster. When the half-mass radius of a cluster is small relative to the overall size, it has a dense core. An example of this is Messier 3 (M3), which has an overall visible dimension of about 18 arc minutes, but a half-mass radius of only 1.12 arc minutes.[53]

Almost all globular clusters have a half-light radius of less than 10 pc, although there are well-established globular clusters with very large radii (i.e. NGC 2419 ( $R_h = 18$  pc) and Palomar 14 ( $R_h = 25$  pc)).[11]

Finally the tidal radius is the distance from the center of the globular cluster at which the external gravitation of the galaxy has more influence over the stars in the cluster than does the cluster itself. This is the distance at which the individual stars belonging to a cluster can be separated away by the galaxy. The tidal radius of M3 is about 38 arc minutes.

[edit] Mass segregation, luminosity and core collapse

In measuring the luminosity curve of a given globular cluster as a function of distance from the core, most clusters in the Milky Way increase steadily in luminosity as this distance decreases, up to a certain distance from the core, then the luminosity levels off. Typically this distance is about  $1\text{--}2$  parsecs from the core. However about 20% of the globular clusters have undergone a process termed "core collapse". In this type of cluster, the luminosity continues to increase steadily all the way to the core region.[54] An example of a core-collapsed globular is M15.

Core-collapse is thought to occur when the more massive stars in a globular cluster encounter their less massive companions. Over time, dynamic processes cause individual stars to migrate from the center of the cluster to the outside. This results in a net loss of kinetic energy from the core region, leading the remaining stars grouped in the core region to occupy a more compact volume. When this gravothermal instability occurs, the central region of the cluster becomes densely crowded with stars and the surface brightness of the cluster forms a power-law cusp.[55] (Note that a core collapse is not the only mechanism that can cause such a luminosity distribution; a massive black hole at the core can also result in a luminosity cusp.)[56] Over a lengthy period of time this leads to a concentration of massive stars near the core, a phenomenon called mass segregation.

The dynamical heating effect of binary star systems works to prevent an initial core collapse of the cluster. When a star passes near a binary system, the orbit of the latter pair tends to contract, releasing energy. Only after the primordial supply of binaries are exhausted due to interactions can a deeper core collapse proceed.[57][58] In contrast, the effect of tidal shocks as a globular cluster repeatedly passes through the plane of a spiral galaxy tends to significantly accelerate core collapse.[59]

The different stages of core-collapse may be divided into three phases. During a globular cluster's adolescence, the process of core-collapse begins with stars near the core. However, the interactions between binary star systems prevents further collapse as the cluster approaches middle age. Finally, the central binaries are either disrupted or ejected, resulting in a tighter concentration at the core.

The interaction of stars in the collapsed core region causes tight binary systems to form. As other stars interact with these tight binaries, they increase the energy at the core, which causes the cluster to re-expand. As the mean time for a core collapse is typically less than the age of the galaxy, many of a galaxy's globular clusters may have passed through a core collapse stage, then re-expanded.[60]

The Hubble Space Telescope has been used to provide convincing observational evidence of this stellar mass-sorting process in globular clusters. Heavier stars slow down and crowd at the cluster's core, while lighter stars pick up speed and tend to spend more time at the cluster's periphery. The globular star cluster 47 Tucanae, which is made up of about 1 million stars, is one of the

densest globular clusters in the Southern Hemisphere. This cluster was subjected to an intensive photographic survey, which allowed astronomers to track the motion of its stars. Precise velocities were obtained for nearly 15,000 stars in this cluster.[61]

A 2008 study by John Fregeau of 13 globular clusters in the Milky Way shows that three of them have an unusually large number of X-ray sources, or X-ray binaries, suggesting the clusters are middle-aged. Previously, these globular clusters had been classified as being in old age because they had very tight concentrations of stars in their centers, another test of age used by astronomers. The implication is that most globular clusters, including the other ten studied by Fregeau, are not in middle age as previously thought, but are actually in 'adolescence'.[62]

The overall luminosities of the globular clusters within the Milky Way and the Andromeda Galaxy can be modeled by means of a gaussian curve. This gaussian can be represented by means of an average magnitude  $M_v$  and a variance  $\sigma^2$ . This distribution of globular cluster luminosities is called the Globular Cluster Luminosity Function (GCLF). (For the Milky Way,  $M_v = -7.20 \pm 0.13$ ,  $\sigma = 1.1 \pm 0.1$  magnitudes.)[63] The GCLF has also been used as a "standard candle" for measuring the distance to other galaxies, under the assumption that the globular clusters in remote galaxies follow the same principles as they do in the Milky Way.

[edit] N-body simulations

Computing the interactions between the stars within a globular cluster requires solving what is termed the N-body problem. That is, each of the stars within the cluster continually interacts with the other  $N-1$  stars, where  $N$  is the total number of stars in the cluster. The naive CPU computational "cost" for a dynamic simulation increases in proportion to  $N^3$ , [64][65] so the potential computing requirements to accurately simulate such a cluster can be enormous.[66] An efficient method of mathematically simulating the N-body dynamics of a globular cluster is done by subdividing into small volumes and velocity ranges, and using probabilities to describe the locations of the stars. The motions are then described by means of a formula called the Fokker-Planck equation. This can be solved by a simplified form of the equation, or by running Monte Carlo simulations and using random values. However the simulation becomes more difficult when the effects of binaries and the interaction with external gravitation forces (such as from the Milky Way galaxy) must also be included.[67]

The results of N-body simulations have shown that the stars can follow unusual paths through the cluster, often forming loops and often falling more directly toward the core than would a single star orbiting a central mass. In addition, due to interactions with other stars that result in an increase in velocity, some of the stars gain sufficient energy to escape the cluster. Over long periods of time this will result in a dissipation of the cluster, a process termed evaporation.[68] The typical time scale for the evaporation of a globular cluster is 10<sup>10</sup> years.[50] In 2010 it became possible to directly compute, star by star, N-body simulations of a globular cluster over the course of its lifetime.[69]

Binary stars form a significant portion of the total population of stellar systems, with up to half of all stars occurring in binary systems. Numerical simulations of globular clusters have demonstrated that binaries can hinder and even reverse the process of core collapse in globular clusters. When a star in a cluster has a gravitational encounter with a binary system, a possible result is that the binary becomes more tightly bound and kinetic energy is added to the solitary star. When the massive stars in the cluster are sped up by this process, it reduces the contraction at the core and limits core collapse.[39]

The ultimate fate of a globular cluster must be either to accrete stars at its core, causing its steady contraction,[70] or gradual shedding of stars from its outer layers.[71]

[edit] Intermediate forms

The distinction between cluster types is not always clear-cut, and objects

have been found that blur the lines between the categories. For example, BH 176 in the southern part of the Milky Way has properties of both an open and a globular cluster.[73]

In 2005, astronomers discovered a completely new type of star cluster in the Andromeda Galaxy, which is, in several ways, very similar to globular clusters. The new-found clusters contain hundreds of thousands of stars, a similar number to that found in globular clusters. The clusters share other characteristics with globular clusters such as stellar populations and metallicity. What distinguishes them from the globular clusters is that they are much larger  $\hat{a}$  several hundred light-years across  $\hat{a}$  and hundreds of times less dense. The distances between the stars are, therefore, much greater within the newly discovered extended clusters. Parametrically, these clusters lie somewhere between a globular cluster and a dwarf spheroidal galaxy.[74]

How these clusters are formed is not yet known, but their formation might well be related to that of globular clusters. Why M31 has such clusters, while the Milky Way does not, is not yet known. It is also unknown if any other galaxy contains these types of clusters, but it would be very unlikely that M31 is the sole galaxy with extended clusters.[74]

[edit] Tidal encounters

When a globular cluster has a close encounter with a large mass, such as the core region of a galaxy, it undergoes a tidal interaction. The difference in the pull of gravity between the part of the cluster nearest the mass and the pull on the furthest part of the cluster results in a tidal force. A "tidal shock" occurs whenever the orbit of a cluster takes it through the plane of a galaxy.

As a result of a tidal shock, streams of stars can be pulled away from the cluster halo, leaving only the core part of the cluster. These tidal interaction effects create tails of stars that can extend up to several degrees of arc away from the cluster.[75] These tails typically both precede and follow the cluster along its orbit. The tails can accumulate significant portions of the original mass of the cluster, and can form clump-like features.[76]

The globular cluster Palomar 5, for example, is near the apogalactic point of its orbit after passing through the Milky Way. Streams of stars extend outward toward the front and rear of the orbital path of this cluster, stretching out to distances of 13,000 light-years.[77] Tidal interactions have stripped away much of the mass from Palomar 5, and further interactions as it passes through the galactic core are expected to transform it into a long stream of stars orbiting the Milky Way halo.

Tidal interactions add kinetic energy into a globular cluster, dramatically increasing the evaporation rate and shrinking the size of the cluster.[50] Not only does tidal shock strip off the outer stars from a globular cluster, but the increased evaporation accelerates the process of core collapse. The same physical mechanism may be at work in Dwarf spheroidal galaxies such as the Sagittarius Dwarf, which appears to be undergoing tidal disruption due to its proximity to the Milky Way.

There are many globular clusters with a retrograde orbit round the galaxy.[78]

[edit] Planets

In 2000, the results of a search for giant planets in the globular cluster 47 Tucanae were announced. The lack of any successful discoveries suggests that the abundance of elements (other than hydrogen or helium) necessary to build these planets may need to be at least 40% of the abundance in the Sun. Terrestrial planets are built from heavier elements such as silicon, iron and magnesium. The very low abundance of these elements in globular clusters means that the member stars have a far lower likelihood of hosting Earth-mass planets, when compared to stars in the neighborhood of the Sun. Hence the halo region of the Milky Way galaxy, including globular cluster members, are unlikely to host habitable terrestrial planets.[79]

In spite of the lower likelihood of giant planet formation, just such an object has been found in the globular cluster Messier 4. This planet was detected orbiting a pulsar in the binary star system PSR B1620-26. The

eccentric and highly inclined orbit of the planet suggests it may have been formed around another star in the cluster, then was later "exchanged" into its current arrangement.[80] The likelihood of close encounters between stars in a globular cluster can disrupt planetary systems, some of which break loose to become free floating planets. Even close orbiting planets can become disrupted, potentially leading to orbital decay and an increase in orbital eccentricity and tidal effects.[81]

[edit] See also

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#### [edit] General resources

NASA Astrophysics Data System has a collection of past articles, from all major astrophysics journals and many conference proceedings.  
 SCYON is a newsletter dedicated to star clusters.  
 MODEST is a loose collaboration of scientists working on star clusters.

Binney, James; Tremaine, Scott (1987). *Galactic Dynamics* (First ed.). Princeton, New Jersey: Princeton University Press. ISBNÂ 0-691-08444-0.  
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Elson, Rebecca; Hut, Piet; Inagaki, Shogo (1987). Dynamical evolution of globular clusters. *Annual review of astronomy and astrophysics* 25 565. Bibcode:Â 1987ARA&A...25..565E  
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#### [edit] External links

