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Senior Division

Group Website

**Annotated Bibliography**

Primary Sources

Archive Centre at King’s College. “The Turing Digital Archive.” King’s College. http://www.turingarchive.org (accessed January 8, 2012).

This website provides numerous digital copies of the original documents that relate to Turing. Documents include letters, publications, lectures, as well as unpublished works. These papers add to the understanding of Turing’s personal life, as well as other projects he was working on that may pertain to the Turing Machine. This source is listed as a primary source because it is a compilation of thousands of pages of original copies.

Gödel, Kurt. “Über formal unentscheidbare sätze der Principia Mathematica und verwandter Systeme I.” Paper, Monatshefte für Mathematik und Physik, 1931.

This was the original paper written by Kurt Gödel in German. With this paper, Gödel introduces his Incompleteness Theorems, which were used by Turing to develop his Turing Machine.

Gödel, Kurt. “Über formal unentscheidbare sätze der Principia Mathematica und verwandter Systeme I.” Translated by Martin Hirzel. Boulder: International Business Corporations, 2000.

This is the translated version of Kurt Gödel’s paper that introduced his Incompleteness Theorems. This source offers an understandable description of the mathematical language and ideas of the time that Alan Turing lived.

Grimson, Eric and Guttag, John. “1: Introduction and Goals; Data Types, Operators, and Variables.” Electrical Engineering and Computer Science from Massachusetts Institute of Technology. http://ocw.mit.edu/courses/electrical–engineering–and–computer–science/6–00–introduction–to–computer–science–and–programming–fall–2008/video–lectures/lecture–1 (accessed January 2, 2012).

This video demonstrates the use of Alan Turing’s work in modern times, as it shows the impact of his work on current computer science. It demonstrates that even today, Turing’s works are being discussed and applied. This is a primary source because it directly demonstrates the many impacts Turing has in modern computer science.

Kleene, Stephen Cole, “Recursive Predicates and Quantifiers.” PDF Document. http://www.ams.org/journals/tran/1943-053-01/S0002-9947-1943-0007371-8/S0002-9947-1943-0007371-8.pdf (accessed January 21, 2012).

This document provides translated quotes of Kurt Gödel’s Incompleteness Theorems. The quotes from Gödel help explain the complex mathematical concepts behind his theorems.

Millican, Peter, and Andy Clark, ed. *Machines and Thought: The Legacy of Alan Turing*. New York: Oxford University Press, 1999.

This book provides some information on other aspects of Turing's research. It includes papers about his lesser–known concepts and project ideas. It had a focus on his studies on artificial intelligence, but also addresses the aspects of human and machine similarity. This is a primary source because it is composed of his papers.

Newman, Max. Max Newman to Alonzo Church, May 31, 1936, in *Alan Turing: The Enigma,* written by Andrew Hodges, New York: Simon and Schuster, 1983.

This letter written from Newman to Alonzo Church discusses the differences between their methods for solving the Entscheidungsproblem. Newman tried to convince Church that their methods could be published independently. This helped show that even though Turing wasn’t the first to publish his work, he still received the most recognition because his explanation was so elegant. This source is primary because it is a copy of the actual letter Newman sent.

Turing, Alan, “On Computable Numbers, with an Application to the Entsheidungsproblem.” Paper, Princeton University, 1936.

This paper, one of Turing’s original works, develops the concept of the Turing Machine and the Universal Machine as methods to solve the Entscheidungsproblem. In addition to mentioning aspects of the Halting Problem, it also gave detailed descriptions on the functions of the Turing Machine. It is a primary source because it is Turing’s own work.

Images

Balaguer, Mark. “Kurt Gödel.” Encyclopedia Britannica. http://www.britannica.com/EBchecked/topic/236770/Kurt-Godel (accessed January 18, 2012).

This source is of an image of Kurt Gödel. This provides a visual for viewers to picture the important mathematicians that influenced Turing’s work.

Butler, Paul. “Visualizing Friendships.” Facebook. http://www.facebook.com/note.php?note\_id=469716398919 (accessed January 21, 2012).

This source provides an image to illustrate how our modern world has become more globalized and connected by computers through the use of social networking sites. The visualization of millions of Facebook friendships between cities around the world indicates how Turing’s work is even today present in all of the processes to share information with others.

Computer History Museum. “Pilot ACE.” Computer History Museum. http://www.computerhistory.org/revolution/birth–of–the–computer/4/96 (accessed January 2, 2012).

This source provides a great visual of Turing’s work. There are few pictures of such machines available, so these pictures are very important to visually depict these early computers.

Cooper, Barry. “The Alan Turing Year - 2012 Turing Centenary.” ATY. http://www.mathcomp.leeds.ac.uk/turing2012/ (accessed January 20, 2012).

This source offers numerous images of Alan Turing. This source also provides numerous links to other sources that also contained relevant images and information.

East of England Broadband Network. “Gallery.” East of England Broadband Network. http://gallery.e2bn.org/gallery1756-historysheroes.html (accessed January 7, 2012).

This image gallery provides a source full of images. There are many images on Bletchley Park and the Enigma, as well as photos of Turing himself.

Heath, Nick. “Photos: Codebreaking Bletchley Park gets £4.6m Lottery Grant: A walk through life inside Britain's WWII codebreaking hub.” Silicon.com. http://www.silicon.com/technology/hardware/2011/10/05/photos-codebreaking-bletchley-park-gets-46m-lottery-grant-39748041/4/#story (accessed January 15, 2012).

This source provides a good selection of images on the Enigma. There were also a few images of Bletchley Park.

Hodges, Andrew. “The Alan Turing Internet Scrapbook.” Alan Turing. http://www.turing.org.uk/turing/scrapbook/spirit.html (accessed January 7, 2012).

This website provides numerous images of Turing from various times in his life. An image found on this website was of his diary entry about Christopher Morcom. This entry expressed Turing’s attraction toward Morcom.

Kettle, Stephen. “Alan Turing.” Stephen Kettle. http://www.stephenkettle.co.uk/turing.html (accessed January 7, 2012).

This website provides images of a sculpture dedicated to Turing for his work on the Enigma at Bletchley Park.

Mschlindwein. “File:Hilbert.jpg.” Wikipedia Commons. http://commons.wikimedia.org/wiki/File:Hilbert.jpg (accessed January 28, 2012).

This source provides an image of Hilbert that was public domain in the US. The real photographer died and the copyright has since expired.

PsdGraphics. “Abstract binary code background.” PsdGraphics. http://www.psdgraphics.com/backgrounds/abstract-binary-code-background (January 16, 2012).

This source provided the image used as the background of the website. It was used because binary is often associated with computing. Furthermore, it is not distracting and does not interrupt a viewer’s focus.

Ryska, Norbert. “Eminent and Enigmatic: 10 Aspects of Alan Turing.” HNF Heinz Nixdorf MuseumsForum GmbH. http://en.hnf.de/Special\_exhibitions/Turing/Turing.asp (accessed January 28, 2012).

This source provides an image of a British Bombe machine. Originally designed by the Polish, Turing implicated ideas from his Turing Machine to enhance the Enigma–breaking machine.

Sanderson, Bill. “Alan Turing, British Mathematician.” Science Photo Library. http://www.sciencephoto.com/media/228929/enlarge (accessed January 16, 2012).

This picture provided a more characterized view of Turing. It added a different visual aspect of Turing because it was not a painting or a photograph like the other images of Turing.

Science and Society Picture Library. *Code–Breaking Personnel at Bletchley Park, 1943*. Photograph. Getty Images. December 31, 1942. http://www.gettyimages.com/detail/news–photo/this–shows–one–of–the–hut–3–priority–teams–at–bletchley–news–photo/90737447 (accessed January 19, 2012).

This shows one of the Hut 3 teams at Bletchley Park, Buckinghamshire, in which civilian and service personnel worked together at code–breaking. The image provides an example of work in a Bletchley Park hut.

Science and Society Picture Library. *Four–rotor German Enigma cypher machine, 1939–1945*. Photograph. Getty Images. October 18, 1996. http://www.gettyimages.com/detail/news–photo/four–rotor–german–enigma–cypher–machine–with–a–second–news–photo/90736440 (accessed January 19, 2012).

This is an image of a German Enigma machine from World War II that was used to code messages. Turing worked on deciphering messages created by such a machine.

Science and Society Picture Library. *Wrens operating the Colossus computer, 1943*. Photograph. Getty Images. December 31, 1942. http://www.gettyimages.com/detail/news–photo/colossus–was–the–worlds–first–electronic–programmable–news–photo/90737445 (accessed January 19, 2012).

This is an image of Colossus, the first electronic programmable computer. The image exemplifies how Turing’s work was crucial in the development of early computers and the breaking of the Enigma code.

Software Architecture. “Application Software.” Software Architecture. http://softwarearc.com (accessed January 28, 2012).

This image is adequate to illustrate the importance of computations in our modern lives. Today, our society is centered on computers.

Secondary Sources

Agar, Jon. *The Government Machine: A Revolutionary History of the Computer*. Cambridge, Massachusetts: MIT Press, 2003.

Included in this book is information regarding the primary purposes and ties that early computing had with governmental agencies. It also illustrates the development of computing. This book ties cracking the Enigma with its influences on modern computing.

Beale, Clive, et al. “Celebrating the Genius of Alan Turing.” Computing at School. http://www.computingatschool.org.uk/data/uploads/newsletter–spring–2012.pdf (accessed January 18, 2012).

The document gives a much broader definition of computability. Thus, his impacts could include aspects in everyday life because it relates Turing’s work to our modern world.

Beavan, Clare “Alan Truing Decoded.” Story Center Productions, LLC. http://www.turingfilm.com (accessed January 22, 2012).

This was a British source that emphasized a more present day view of Turing’s story. We quoted this source a few times, as it offered valuable insight for any reader into Turing’s revolutionary work.

Ceruzzi, Paul. *A History of Modern Computing*. Cambridge, Massachusetts: MIT Press, 1998.

This book offers a general overview of the development of computers. It is primarily used to address the impacts of Turing on computations and the development of computers over time. It addresses the creation of the first electronic digital computer to the advent of the World Wide Web.

Coleman, Sean, “Information Pioneers: Episode Two Alan Turing.” PDF Document, http://pioneers.bcs.org/media/18022/information%20pioneers%20–%20alan%20turing%20shooting%20script.pdf (accessed January 28, 2012).

This is the transcript of the video done by PioneerBCS. It demonstrates the importance of Turing’s work and the impacts they had on computing. It also addresses why his works were so revolutionary.

Computer History Museum. “Opening Moves: Origins of Computer Chess – Early Theorists.” Computer History Museum. http://www.computerhistory.org/chess/main.php?sec=thm–42b86c2029762&sel=thm–42b89c3224944 (accessed January 2, 2012).

This source provides an intriguing look into one of Turing’s projects that is not described accurately in other sources. In doing so, this source also demonstrates a separate part of Turing’s work that is not often highlighted.

Computer History Museum. “Timeline of Computer History.” Computer History Museum. http://www.computerhistory.org/timeline (accessed January 2, 2012).

This timeline gives a great general overview of computer history. It puts much of Turing’s work into perspective and presents a chronological way of looking at Turing’s works. This information helps develop the sequential impact of Turing’s ideas.

Copeland, Jack. *The Essential Turing: Seminal Writings in Computing, Logic, Philosophy, Artificial Intelligence, and Artificial Life plus The Secrets of Enigma*. Oxford: Oxford University Press, 2004.

This source provides many facts regarding Turing’s work with the Enigma code. The book also illustrates how his theoretical work helped develop the first computers by implementing his ideas in more practical methods.

Cormen, Thomas, et al. *Introduction to Algorithms*. Cambridge, Massachusetts: MIT Press, 1990

This book is a great reference about computer science, and some of the ideas Turing pioneered. It also clarifies some of the complex topics discussed by Turing. It stresses the introduction of algorithms and how these change computations and computer science.

Corrigan, Jim. *Profiles in Mathematics: Alan Turing*. New York: Morgan Reynolds Publishing, 2007.

This source provides basic background information of Turing’s work in mathematics as well as his work on the Enigma. The workings of the Enigma machine and the decryption process that Turing worked on are also described. The book also addresses the impacts of Turing’s appearance and character on other people.

East of England Broadband Network. “History’s Heroes: Alan Turing.” East of England Broadband Network. http://historysheroes.e2bn.org/hero/91 (accessed January 2, 2012).

This website helps in gaining a general understanding for Turing’s major achievements and his personal life. The website’s layout also provides a way to break up his life and achievements. The timeline on the site provides descriptions of key dates in Turing’s personal life and work.

Editors of Philosophical Readings. “Call for Papers: Alan Turing’s Philosophy.” University of Chicago Press. http://philosophicalreadings.files.wordpress.com/2011/12/cfpturing.pdf (accessed January 18, 2012).

This source provides many quotes about Alan Turing’s impact. It also shows the broader scope of his work. This webpage is one of the few sources that directly address his work on philosophy.

Epstein, Robert. Roberts, Gary. Beber, Grace. *Parsing the Turing Test: Philosophical and Methodological Issues in the Quest for the Thinking Computer.* San Diego, CA: Springer, 2008.

This source focuses on the philosophical and methodological problems in the search for true artificial intelligence, a subject essentially created by Alan Turing. This source helps show that the impact of Turing’s work is not evident only in early computing, but also in how the world as a whole thinks.

Gottfried, Ted*. Alan Turing: The Architect of the Computer Age*. London: Franklin Watts, 1996.

This book provides a broad overview of his life. It incorporates details from his life with aspects of his work. It is important in understanding the scope of Turing. Through its mention of numerous projects, the work is great for learning about how his works are applied to modern technology.

Gray, Paul. “Computer Scientist: Alan Turing.” Time Magazine, March 29, 1999.

This magazine article provided a quote for the impact of Alan Turing’s work on the field of computing. It also illustrated how his his work can be seen even today.

Harrington, Julia. “Channel 4 Commissions: Alan Turing Documentary.” Channel 4. http://www.channel4.com/info/press/news/channel–4–commissions–alan–turing–documentary (accessed January 29, 2012).

This source provides some quotes for the impact Alan Turing had on society by comparing him to figures such as Isaac Newton, Albert Einstein and Charles Darwin. In this source is a quote that summarizes the topic and shows the overall importance of Alan Turing in revolutionizing computing.

Henderson, Harry. *Alan Turing: Computing Genius and Wartime Code Breaker*. New York: Chelsea House Publishers, 2011.

This book covers Turing’s life in its entirety, which makes it a good source for most of the general information that we need. There is a large section purely devoted to the Entscheidungsproblem, Gödel’s Incompleteness Theorems, and Church’s work on Lambda Calculus. This book also covers his legacy, which shows the continuing impact of his life’s work in computability.

Hodges, Andrew. “Alan Turing: A Short Biography.” Alan Turing. http://www.turing.org.uk/bio (accessed January 8, 2012).

This page provides images of Alan Turing from 1931 and 1934, as well as information about his life during this time and personal information from his private notes. This proved to be very helpful in writing about his life in college, as well as his social life.

Hodges, Andrew. *Alan Turing: The Enigma*. New York: Simon and Schuster, 1983.

This book is a great resource regarding Turing’s work in World War II as well as some of his early developments in computational thinking. It also chronicles his correspondence with some of his contemporaries. Included are letters between Church and others, as well as Turing and his mother.

Hodges, Andrew. *Turing (The Great Philosophers Series).* New York, NY: Phoenix, 1997.

This source is helpful in simplifying the complex philosophical thoughts and ideas of Alan Turing, thus making the subject more understandable for people unfamiliar with the topic. This book also shows the driving force behind much of Turing’s work, allowing a more detailed and informative background on Turing.

Leavitt, David. *The Man Who Knew Too Much: Alan Turing and the Invention of the Computer*. New York: Atlas Books, 2006.

This book focuses on the more personal side of Turing. It elaborates on how his personal life affected the development of his works. It also has a very good explanation of the Turing Machine and goes into great detail.

Michael Main, interview by Logan Garbarini, Boulder, CO, March 2, 2012.

This interview provided emphasis on the impacts of Turing’s work, elaborating on many of the computational aspects and revolutionary details. Main gave theoretical examples of the uses of the Turing Machine.

Petzold, Charles. *The Annotated Turing: A Guided Tour Through Alan Turing's Historic Paper on Computability and the Turing Machine*. Hoboken, New Jersey: John Wiley and Sons, 2008.

Introduced in this book is the Turing Machine, which is the foundation to all computer programming. This book, comprised of Turing’s original paper, is interpreted and explained, incorporating details of Turing’s life. It provides specifics on mathematical principals, such as the Entscheidungsproblem and Gödel’s Incompleteness Theorems. Even though this source contains Turing’s Paper, it is listed as a secondary source because it was primarily used for its analysis.

Petzold, Charles. “The Annotated Turing: A Guided Tour through Alan Turing’s Historic Paper on computability and the Turing Machine.” University of Toronto. http://www.archive.org/details/TheAnnotatedTuringAGuidedTourThroughAlanTuringsHistoricPaperOn (accessed January 2, 2012).

This lecture gives additional information on Turing’s paper and offers great explanations. In addition to the information mentioned in Petzold’s book by the same title, the lecture also provides broader descriptions of the Turing Machine. Petzold also expands on the information included in the mathematical background.

PioneerBCS, “Info Pioneers – Kate Russell Presents Alan Turing.” DailyMotion Video, http://www.dailymotion.com/video/xdglqz\_info–pioneers–kate–russell–presents\_tech (accessed January 21, 2012).

This is a great video for a view of Turing’s impact on the ideological aspects of computing that he focused on. This source illustrates a larger impact than books and other sources have of him, as it is directed towards a broader audience. The video also provides an animation of a Turing machine.

Ryska, Norbert. “Eminent and Enigmatic: 10 Aspects of Alan Turing.” HNF Heinz Nixdorf MuseumsForum GmbH. http://en.hnf.de/Special\_exhibitions/Turing/Turing.asp (accessed January 28, 2012).

This is a web page for an exhibit, from which we used quotes and information about Turing's work in computability. The site also addressed Turing’s work on breaking the Enigma code.

Singh, Simon. *The Code Book: The Science of Secrecy from Ancient Egypt To Quantum Cryptography.* New York: Anchor Books, 2000.

This book is more focused on cryptography, which helped develop his work with the Enigma. It is helpful in understanding an overview of the work Turing did for the effort in World War II by providing background and specifics of the Enigma. The source offers an easy explanation on how the Enigma worked and how it could be broken. It also provides some analysis of his legacy.

Strathern, Paul. *Turing and the Computer: The Big Idea.* New York, NY: Anchor Books, 1997.

This source gives a brief and concise summary of all the events that led to the creation of the first computer. It also provides a summarized account of Alan Turing’s life. This source proves to be very helpful in understanding his background and early life.

Teuscher, Christof, ed. *Alan Turing: Life and Legacy of a Great Thinker*. Berlin: Springer–Verlag, 2004.

This book provides an in–depth look into each of the subjects that Turing revolutionized. It covers how these individual improvements affect technology today. In addition to information on the Enigma, it also presents information on technicalities of the Turing Machine. It gives examples of and elaborates on many programs.

Viehoff, Wiltrud, “Eminent and Enigmatic – 10 Aspects of Alan Turing.” PDF Document, http://en.hnf.de/Special\_exhibitions/Turing/Programm\_Turing\_engl\_9–1–12\_72dpi.pdf (accessed January 19, 2012).

This is a great source for putting Turing’s work on the Enigma in perspective. It is also the perfect source for connecting Turing’s work to specific computers and computer science breakthroughs.

Weisstein, Eric W. “Decision Problem.” Wolfram MathWorld. http://mathworld.wolfram.com/DecisionProblem.html (accessed January 8, 2012).

This source provides a deeper understanding of the Entscheidungsproblem (German for the Decision Problem). Alan Turing developed his conceptual Turing Machine in order to solve this problem. This source also provides additional resources about the problem, as well as other problems that interested Turing.

Wolfram|Alpha Knowledgebase. “Gödel’s first Incompleteness Theorem.” Wolfram Mathematica. http://www.wolframalpha.com/input/?i=g%C3%B6del%27s+first+incompleteness+theorem (accessed January 8, 2012).

This source provides information and understanding of Gödel’s first Incompleteness Theorem. It also supplies a simplified definition. This theorem was crucial to help Turing develop the Turing Machine. The background sources and references present further information and details about this theorem.

Wolfram|Alpha Knowledgebase. “Gödel's Second Incompleteness Theorem.” Wolfram Mathematica.  
http://www.wolframalpha.com/input/?i=g%C3%B6del%27s+second+incompleteness+theorem (accessed January 8, 2012).

This source provides the information for the second part of Gödel’s Incompleteness Theorems. It too provides a simplified definition of the theory. This theorem was important in helping Turing understand and later solve the Halting Problem posed by his Turing Machine.