

## Charles Babbage, Ada Lovelace, and The Difference Engine References

Stephanie Foti

MM6101, Winter 2011

### MUSIC

Alianello, Monica. *Nocturne No.1 in E Flat Major*, John Field. "Nocturnes - John Field." *The Piano Society*. N.p., n.d. Web 17 Feb 2011.

<<http://pianosociety.com/cms/index.php?section=886>>.

### IMAGES AND VIDEO

- 00:00      *Town of Sheffield looking east from St. John's Church*, circa 1874  
"LIFE: Town of Sheffield looking east from St. ... - Hosted by Google." *Google Images*. N.p., n.d. Web. 17 Feb. 2011. <<http://images.google.com/hosted/life/?imgurl=6432d01c9d0487ee&q=great%20britain%20industrial%20revolution&prev=/images%3Fq%3Dgreat%20britain%20industrial%20revolution%26um%3D1%26hl%3Den%26client%3Dfirefox-a%26hs%3Dbo4%26rls%3Dorg.mozilla:en-US:official%2>>.
- 00:15      Cutler, Sarah. "steam-engine.jpg." *Irish Views*. N.p., n.d. Web. 17 Nov. 2011. <[www.irishviews.com/steam-engine.jpg](http://www.irishviews.com/steam-engine.jpg)>.
- 00:22      *Charles Babbage*, Samuel Lawrence  
public domain, [http://commons.wikimedia.org/wiki/File:Charles\\_Babbage\\_by\\_Samuel\\_Laurence.jpg](http://commons.wikimedia.org/wiki/File:Charles_Babbage_by_Samuel_Laurence.jpg)
- 00:25      Ada Lovelace, 1836, Margaret Sarah Carpenter  
"THE VIRTUAL VICTORIAN: ADA LOVELACE AND THE DIFFERENCE ENGINE...." *THE VIRTUAL VICTORIAN*. N.p., n.d. Web. 17 Feb. 2011. <<http://virtualvictorian.blogspot.com/2010/03/ada-lovelace-and-difference-engine.html>>.
- 00:32      *Ludgate Hill - A block in the Street--* from London, A Pilgrimage, 1872, Gustave Doré, public domain,  
[http://commons.wikimedia.org/wiki/File:Gustave\\_Dor%C3%A9\\_-\\_Ludgate\\_Hill.png](http://commons.wikimedia.org/wiki/File:Gustave_Dor%C3%A9_-_Ludgate_Hill.png)
- 00:44      Lower Slaughter water wheel, Beth Villanyi  
"Lower Slaughter water wheel pictures from united kingdom photos on webshots." *travel photos and pictures on webshots*. N.p., n.d. Web. 17 Feb. 2011. <<http://travel.webshots.com/photo/1439109665014263511KAgdDN>>

Charles Babbage, Lawrence, Samuel.  
"Charles Babbage\_Oil Painting." *Art Clon*. N.p., n.d. Web. 17 Feb. 2011.  
<[www.artclon.com/goods.php?id](http://www.artclon.com/goods.php?id)

- 00:48 Railway workers  
Williams, Stuart . "Walsall's Railways - stuartwilliams.net." *Home - stuartwilliams.net*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.stuartwilliams.net/walsallrailways.htm>>.
- 00:53 Munson, James. "Forgotten Steam" *Vimeo, Video Sharing For You*. N.p., n.d. Web. 17 Feb. 2011. <<http://vimeo.com/13093359>>.
- 00:56 *A View in Whitechapel Road, 1831*, H.T. Alken, public domain, <http://commons.wikimedia.org/wiki/File:1831-View-Whitechapel-Road-steam-carriage-caricature.jpg>
- 01:06 Munson, James. "Forgotten Steam" *Vimeo, Video Sharing For You*. N.p., n.d. Web. 17 Feb. 2011. <<http://vimeo.com/13093359>>.
- 01:12 *The Burning of the Houses of Lords and Commons, 16 October, 1834*, 1835, J.M.W. Turner, public domain, [http://en.wikipedia.org/wiki/File:Turner-The\\_Burning\\_of\\_the\\_Houses\\_of\\_Lords\\_and\\_Commons.jpg](http://en.wikipedia.org/wiki/File:Turner-The_Burning_of_the_Houses_of_Lords_and_Commons.jpg)
- 01:18 *Salon de Madame Geoffrin, 1812*, Anicet Charles Gabriel Lemonnier, public domain, [http://commons.wikimedia.org/wiki/File:Salon\\_de\\_Madame\\_Geoffrin.jpg](http://commons.wikimedia.org/wiki/File:Salon_de_Madame_Geoffrin.jpg)
- 01:22 Mechanical Globe  
"Mechanical globe and movement." *Wikimedia Commons*. N.p., n.d. Web. 17 Feb. 2011. <[commons.wikimedia.org/wiki/File:BLW\\_Mechanical\\_globe\\_and\\_movement\\_.jpg](http://commons.wikimedia.org/wiki/File:BLW_Mechanical_globe_and_movement_.jpg)>.
- 01:36 *Newton 1795-1805*, William Blake  
public domain, [http://en.wikipedia.org/wiki/Newton\\_%28Blake%29](http://en.wikipedia.org/wiki/Newton_%28Blake%29)
- 01:47 photograph of Charles Babbage  
"LIFE: Portrait of Charles Babbage (1792-1871),... - Hosted by Google." *Google Images*. N.p., n.d. Web. 17 Feb. 2011. <<http://images.google.com/hosted/life/?imgurl=19fc9fba4ea4a1cb&q=charles%20babbage&prev=/images%3Fq%3Dcharles%2Bbabbage%26um%3D1%26hl%3Den%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official%26biw%3D1008%26b>
- 01:53 Gears and Plans, Marcin Wichary  
"A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR* :

*National Public Radio : News & Analysis, World, US, Music & Arts : NPR.*  
N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.

- 01:56 Cambridge Observatory  
Hurn, Mark, Departmental Librarian.. "Institute of Astronomy, University of Cambridge | BSHS Travel Guide." *The British Society for the History of Science.* N.p., n.d. Web. 17 Feb. 2011. <<http://www.bshs.org.uk/travel-guide/institute-of-astronomy-university-of-cambridge>>.
- 02:00 *Sir John Herschel*, circa 1835, Henry William Pickersgill  
public domain, [http://commons.wikimedia.org/wiki/File:Sir\\_John\\_Herschel,\\_by\\_Henry\\_William\\_Pickersgill\\_%28detail%29.jpg](http://commons.wikimedia.org/wiki/File:Sir_John_Herschel,_by_Henry_William_Pickersgill_%28detail%29.jpg)
- 02:07 Cambridge Observatory  
Hurn, Mark, Departmental Librarian.. "Institute of Astronomy, University of Cambridge | BSHS Travel Guide." *The British Society for the History of Science.* N.p., n.d. Web. 17 Feb. 2011. <<http://www.bshs.org.uk/travel-guide/institute-of-astronomy-university-of-cambridge>>.
- 02:10 Book of charts, Marcin Wichary  
"A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR.* N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 02:13 Large gears, Marcin Wichary  
"A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR.* N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 02:22 Typesetting  
"Melbourne Museum of Printing - Typesetting: Invitation and Program." *Museums of Printing Portal - also Balance Research.* N.p., n.d. Web. 17 Feb. 2011. <<http://www.printingmuseums.com/museum/gallery/typset01/enlarg01.htm>>.
- 02:25 Calendar Stereotype  
"Melbourne Museum of Printing - Stereotyped Calendar Unit - January 1932." *Museums of Printing Portal - also Balance Research.* N.p., n.d. Web. 17 Feb. 2011. <<http://www.printingmuseums.com/museum/gallery/stereo01/ast0206b.htm>>.
- 02:28 Timing diagram, Marcin Wichary

- "A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 02:35 Lynn, Ian Stuart. "Dream of Steam." *Vimeo, Video Sharing For You*. N.p., n.d. Web. 17 Feb. 2011. <<http://vimeo.com/8873590>>.
- 02:46 Wired. "Babbage's Difference Engine No. 2 ." *YouTube - Broadcast Yourself*. . N.p., n.d. Web. 17 Feb. 2011. <<http://www.youtube.com/watch?v=0anlyVGeWOI>>.
- 03:04 Difference Engine No. 1  
Eckert, Presper. "Computer History ." *UNCW Faculty and Staff*. N.p., n.d. Web. 17 Feb. 2011. <<http://people.uncw.edu/tompkinsj/112/texnh/handouts/historyHandout.html>>.
- 03:12 Antique tools  
"691: 19th c. Wooden Tool Caddy, with early tools – Case Antiques." *Case Antiques*. N.p., n.d. Web. 17 Feb. 2011. <<http://caseantiques.com/item/691-19th-c-wooden-tool-caddy-with-early-tools/>>.
- 03:14 Joseph Clements Tools  
"Joseph Clement - The Babbage Engine | Computer History Museum." *Computer History Museum*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.computerhistory.org/babbage/josephclement/>>.
- 03:18 Gears and Plans, Marcin Wichary  
"A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 03:20 Babbage Difference Engine (wheel detail), Robert Hinkley  
" Semiskimmed.net - All the goodness, half the fat.." *Semiskimmed.net - All the goodness, half the fat.*. N.p., n.d. Web. 17 Feb. 2011. <<http://semiskimmed.net/23.html>>.
- 03:25 Babbage Difference Engine (top detail), Robert Hinkley  
" Semiskimmed.net - All the goodness, half the fat.." *Semiskimmed.net - All the goodness, half the fat.*. N.p., n.d. Web. 17 Feb. 2011. <<http://semiskimmed.net/23.html>>.
- 03:30 Ada Lovelace, 1836, Margaret Sarah Carpenter

"THE VIRTUAL VICTORIAN: ADA LOVELACE AND THE DIFFERENCE ENGINE...." *THE VIRTUAL VICTORIAN*. N.p., n.d. Web. 17 Feb. 2011. <<http://virtualvictorian.blogspot.com/2010/03/ada-lovelace-and-difference-engine.html>>.

- 03:37 Lord Byron portrait  
"byron." *imageshack*. N.p., n.d. Web. 17 Feb. 2011. <[img511/7420/byron.jpg](http://img511.imageshack.us/img511/7420/byron.jpg)>.
- 03:39 *Portrait of Annabella Byron (nee Anne Isabella Milbanke) (1792-1860)*, 1812, Sir George Hayter, public domain,  
[http://commons.wikimedia.org/wiki/File:Annabella\\_Byron\\_%281792-1860%29.jpg](http://commons.wikimedia.org/wiki/File:Annabella_Byron_%281792-1860%29.jpg)
- 03:50 Geometry  
"Chapter 302 An Early 19th Century Math Primer « Book Hunter's Holiday." *Book Hunter's Holiday*. N.p., n.d. Web. 17 Feb. 2011. <<http://bookhuntersholiday.wordpress.com/2008/11/10/chapter-302-an-early-19th-century-math-primer/>>.
- 03:59 Handwritten music  
"Contrapas.jpg." *Wikimedia Commons*. N.p., n.d. Web. 17 Feb. 2011. <[commons.wikimedia.org/wiki/File:Contrapas.jpg](http://commons.wikimedia.org/wiki/File:Contrapas.jpg)>.
- 04:03 Cube root  
"Chapter 302 An Early 19th Century Math Primer « Book Hunter's Holiday." *Book Hunter's Holiday*. N.p., n.d. Web. 17 Feb. 2011. <<http://bookhuntersholiday.wordpress.com/2008/11/10/chapter-302-an-early-19th-century-math-primer/>>.
- 04:10 Analytic Engine, mill  
"index Early computing-related items." *Welcome to the School of Computer Science - The University of Nottingham*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.cs.nott.ac.uk/~ef/ComputerXHistory/EarlyHistory/index.htm>>.
- 04:23 Bernuli Numbers  
Kim, Eugene Eric, and Betty Alexandra Toole. "Ada and the First Computer." *Scientific American* May 1999: 76-81. Print.
- 04:32 Punched cards  
"Plan 28 | John Graham-Cumming." *John Graham-Cumming - Blog*. N.p., n.d. Web. 17 Feb. 2011. <<http://blog.jgc.org/2010/09/plan-28.html>>.
- 04:38 Jacquard Loom, David Monniaux, 2006  
"Jacquard loom p1040320.jpg." *Wikimedia Commons*. N.p., n.d. Web. 17 Feb.

2011. <[commons.wikimedia.org/wiki/File:Jacquard\\_loom\\_p1040320.jpg](http://commons.wikimedia.org/wiki/File:Jacquard_loom_p1040320.jpg)>.

- 04:06      Jacquard fabric  
"Cherie Rouge | Online Fabric Stores | Upholstery Fabric | Discount Fabrics." *Online Discount Drapery Fabrics and Upholstery Fabric Super Store!*. N.p., n.d. Web. 17 Feb. 2011. <<http://warehousefabricsinc.com/CHEROE.html>>.
- 04:50      Analytic Engine, store  
"index Early computing-related items." *Welcome to the School of Computer Science - The University of Nottingham*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.cs.nott.ac.uk/~ef/ComputerXHistory/EarlyHistory/index.htm>>.
- 04:58      Analytic Engine, mill  
"index Early computing-related items." *Welcome to the School of Computer Science - The University of Nottingham*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.cs.nott.ac.uk/~ef/ComputerXHistory/EarlyHistory/index.htm>>.
- 05:02      Analytic Engine Diagram  
"Yahoo! Groups ." *Yahoo! Groups : Directory : Computers Internet* . N.p., n.d. Web. 17 Feb. 2011. <<http://tech.groups.yahoo.com/group/metaphorical/message/459>>.
- 05:10      Paper printout, Marcin Wichary  
"A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 05:16      Munson, James. "Forgotten Steam" *Vimeo, Video Sharing For You*. N.p., n.d. Web. 17 Feb. 2011. <<http://vimeo.com/13093359>>.
- 05:22      Ada painting with math  
Kim, Eugene Eric, and Betty Alexandra Toole. "Ada and the First Computer." *Scientific American* May 1999: 76-81. Print.
- 05:32      Analytic Engine, mill  
"index Early computing-related items." *Welcome to the School of Computer Science - The University of Nottingham*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.cs.nott.ac.uk/~ef/ComputerXHistory/EarlyHistory/index.htm>>.
- 05:40      Printed music  
"Rusty Music - PentaxForums.com." *The Largest Pentax Camera & Photography Forum and Review Site - PentaxForums.com Home*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.pentaxforums.com/forums/post-your-photos/87532-macro->

rusty-music.html>.

- 05:46 Babbage Machine  
Feb. "Babbage Machine- an earlier computer." *members.peak*. N.p., n.d. Web. 17 Feb. 2011. <<http://members.peak.org/~jeremy/superlative/babbageMachine.html>>.
- 05:54 *A closeup of the London Science Museum's replica difference engine, built from Babbage's design*, 2005, Carsten Ullrich  
"LondonScienceMuseumsReplicaDifferenceEngine.jpg." *Wikimedia Commons*. N.p., n.d. Web. 17 Feb. 2011. <<http://commons.wikimedia.org/wiki/File:LondonScienceMuseumsReplicaDifferenceEngine.jpg>>
- 06:04 Wired. "Babbage's Difference Engine No. 2 ." *YouTube - Broadcast Yourself*. . N.p., n.d. Web. 17 Feb. 2011.  
<<http://www.youtube.com/watch?v=0anlyVGeWOI>>.
- 06:12 Table of Astronomy, Cyclopaedia, Volume 1, p 164, public domain,  
[http://commons.wikimedia.org/wiki/File:Table\\_of\\_Astronomy,\\_Cyclopaedia,\\_Volume\\_1,\\_p\\_164.jpg](http://commons.wikimedia.org/wiki/File:Table_of_Astronomy,_Cyclopaedia,_Volume_1,_p_164.jpg)
- 06:20 Numbered wheels, Marcin Wichary  
"A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 06:26 Difference Engine, Marcin Wichary  
"A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 06:30 photograph of Charles Babbage  
"LIFE: Portrait of Charles Babbage (1792-1871),... - Hosted by Google." *Google Images*. N.p., n.d. Web. 17 Feb. 2011. <<http://images.google.com/hosted/life/?imgurl=19fc9fba4ea4a1cb&q=charles%20babbage&prev=/images%3Fq%3Dcharles%2Bbabbage%26um%3D1%26hl%3Den%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official%26biw%3D1008%26b>>
- 06:33 Science Museum Logo, Lajos Dioszegi  
Eypórsdóttir, Katrín. "Museum Signs Part 1 - Smashing Magazine." *Smashing Magazine*. N.p., n.d. Web. 17 Feb. 2011.  
<<http://www.smashingmagazine.com/museum-signs-part-1/>>.

- 06:39 Close-up levers, Marcin Wichary  
 "A 19th-Century Mathematician Finally Proves Himself : NPR." *NPR : National Public Radio : News & Analysis, World, US, Music & Arts : NPR*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.npr.org/templates/story/story.php?storyId=121206408>>.
- 06:47 Collier, Bruce, and James H. MacLachlan. *Charles Babbage and the engines of perfection* . New York: Oxford University Press, 1998. Print.
- 06:53 Difference Engine at The Computer History Museum  
 violetohara. "Difference Engine No. 2 | Flickr - Photo Sharing!." *Welcome to Flickr - Photo Sharing*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.flickr.com/photos/violetohara/3581908375/>>.
- 07:03 *Charles Babbage*, Samuel Lawrence  
 public domain, [http://commons.wikimedia.org/wiki/File:Charles\\_Babbage\\_by\\_Samuel\\_Laurence.jpg](http://commons.wikimedia.org/wiki/File:Charles_Babbage_by_Samuel_Laurence.jpg)
- Ada Lovelace, 1836, Margaret Sarah Carpenter  
 "THE VIRTUAL VICTORIAN: ADA LOVELACE AND THE DIFFERENCE ENGINE...." *THE VIRTUAL VICTORIAN*. N.p., n.d. Web. 17 Feb. 2011. <<http://virtualvictorian.blogspot.com/2010/03/ada-lovelace-and-difference-engine.html>>.
- 07:08 ENIAC  
 "Historic Computer Images." *FTP.ARL.ARMY.MIL Home Page*. N.p., n.d. Web. 17 Feb. 2011. <<http://ftp.arl.army.mil/ftp/historic-computers/>>.
- 07:14 Font view of the completed ABC replica  
 "Recorded Demonstration." *Main Page*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.scl.ameslab.gov/ABC/may98/May98.html>>.
- 07:18 Babbage Machine  
 "Babbage Machine- an earlier computer." *members.peak*. N.p., n.d. Web. 17 Feb. 2011. <[members.peak.org/~jeremy/superlative/babbageMachine.html](http://members.peak.org/~jeremy/superlative/babbageMachine.html)>.

## INFORMATIONAL REFERENCES

Collier, Bruce, and James H. MacLachlan. *Charles Babbage and the engines of perfection* . New York: Oxford University Press, 1998. Print.

Golden, Frederic. "Who Built The First Computer? - TIME." *Breaking News, Analysis, Politics, Blogs, News Photos, Video, Tech Reviews - TIME.com*. N.p., 29 Mar. 1999. Web. 17 Feb. 2011.

<<http://www.time.com/time/magazine/article/0,9171,990596,00.html>>.

"Industrial Revolution in Britain." *UMD Web Site - UMass Dartmouth*. N.p., n.d. Web. 17 Feb. 2011. <<http://www1.umassd.edu/ir/>>.

00:56 reference "*Liberals insisted that the well being of the common people was not a matter of 'rose covered cottages' but of 'steam power and independence.'*" "

Kim, Eugene Eric, and Betty Alexandra Toole. "Ada and the First Computer." *Scientific American* May 1999: 76-81. Print.

04:38 quote, "*We say most aptly that the Analytical Engine weaves algebraical patterns just as the Jacquard-loom weaves flowers and leaves.*"

Kreis, Steven. "Lecture 16: The Romantic Era." *The History Guide -- Main*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.historyguide.org/intellect/lecture16a.html>>.

01:22 quote, "*As the physical universe was ultimately machinelike, so social organization could be fashioned after the machine.*" "

01:36 reference, "*The Romantics sought their soul in the science of life, not the science of celestial mechanics. They moved from planets to plants. The experience was positively exhilarating, explosive and liberating -- liberation from the soulless, materialistic, thinking mechanism that was man.*"

"The Babbage Engine | Computer History Museum." *Computer History Museum*. N.p., n.d. Web. 17 Feb. 2011. <<http://www.computerhistory.org/babbage/>>.

Toole, Dr. Betty. "Ada Byron, Lady Lovelace (1815-1852)." *yale.edu*. N.p., n.d. Web. 17 Feb. 2011. <[www.cs.yale.edu/homes/tap/Files/ada-bio.html](http://www.cs.yale.edu/homes/tap/Files/ada-bio.html)>.