

Bet You've Never Heard of Herman Hollerith

by Lynne Belluscio

I just returned from California where I spent Thanksgiving with my son and his family. "So Mom, let's go over to the Computer History Museum. They have a Babbage Machine." "Isn't that the English guy who developed a type of computer but he was never given credit for his innovations?" Sure enough, the museum has a working model of the Babbage Difference Machine #2.

In 1821, Charles Babbage was reading through pages of mathematical calculations and was frustrated by the errors. At that time, books were typeset by hand, and it was easy to make mistakes with numbers. If you typeset words, an editor can read a proof of the page and make corrections, but with mathematical tables, unless you do the calculations, there is no way to know if there is a mistake.

Babbage envisioned a machine that would do the calculations, and then print the results and make a plaster cast that could be used to make a printing plate. He made a small working component that he used for demonstrations, but never built a complete machine.

A hundred and fifty years later the London Science Museum built Babbage's Difference Machine #2. It took 17 years to complete. It has 8,000 parts, and weighs 5 tons. A few years later a second model was built and was sent to the Computer History Museum in Mountain View, California. It is a sight to behold, as the crank is wound and all the levers and gears move and the numbered pieces move into place. I have to admit, that my recollection of polynomials is pretty slim. But while reading about Babbage, I discovered Ada Lovelace, who was Lord Byron's only legitimate daughter. She met Babbage and was enthralled with the potential of the Difference Machine. Her mathematical mind, "interpreted" the machine and she is credited by some, as writing the first algorithm to be carried out by a machine. She is also described as the world's first computer programmer.

Around the corner from the Babbage Difference Machine, is an exhibit about another early computer designed by Herman

Hollerith – someone I had never heard of. The Hollerith machine was developed to process the data from the United States Census which had become a nightmare. The tenth Federal Census was held in 1880. It took eight years to collate the information and another Census was scheduled in 1890.

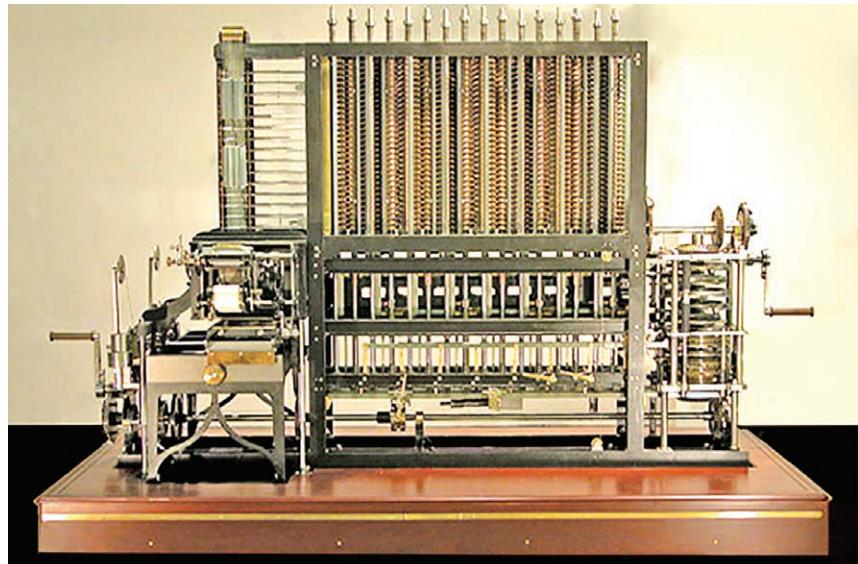
In 1888, a contest was held to find a method of tabulating some of the information from the 1880 census. Herman Hollerith's machine was successful and was used for the 1890 Census. In fact, Hollerith machines were used into the 1950s when they were replaced with computers.

The Hollerith machine read punched cards, that were prepared by census clerks who used pantograph machines to transfer the information from the census forms to the punched cards. A clerk could prepare 500 cards a day. Then one by one the cards were placed between two plates and small metal pins would pass through the holes into a layer of mercury making an electrical connection which in turn turned the dials on the machine. After the card was read, it was sorted into a file. An experienced tabulator could process 80 cards an hour.

Sources disagree about how long it took to tabulate all the data from the 1890 census with the Hollerith Machine, but in only six weeks, they were able to report that the total population of the United States was 62,947,714.

Some say it was months and others say it was three years, but it certainly wasn't the eight years needed for the 1880 census. It saved the government \$5 million. Hollerith received a Doctorate from Columbia University for his work. His machines were used to collect census data in many other countries.

In 1911, Hollerith joined with several other companies and formed the Computing-Tabulat-



The Babbage engine.

ing-Recording Company (CTR) which changed its name to the International Business Machines Corporation (IBM) in 1924.

Unfortunately, as many of you know, who have gone to the 1890 census for family genealogical information, the original data sheets were destroyed. After the data was transferred to the Hollerith machines and tabulated, all the original sheets were boxed up and put into storage.

In 1921, there was a fire in the storage facility and about 15% of the records were damaged by smoke, fire, and water. (It is generally reported that all of the records were destroyed by the fire, but that is not correct. Only a small portion were actually destroyed by the fire.) The records were unique because they recorded information from each family, but no one seemed to care much about saving the damaged papers.

In December 1932, the chief Clerk of the Bureau of Cen-

sus ordered the records to be destroyed. The Librarian of Congress unfortunately did not identify the records as having any historical importance, so the original records were lost. Later, a small handful of records were discovered which included 6,160 family sheets.

At the time of the 1921 fire there was no Federal Archives, but the fire brought attention to the lack of adequate storage for important papers. In fact, someone noted that even the original copy of the Declaration of Independence and the Constitution, were in peril during the fire. They escaped damage only because they were stored on the sixth floor of the building that housed the Census records. Ironically, just one day before Congress authorized the destruction of the 1890 census papers, President Herbert Hoover, laid the cornerstone for the National Archives Building.



Hollerith machine.