



From the Annals of the World History

Johannes Gutenberg

June 23, 1398 - February 3, 1468



Johannes Gensfleisch zur Laden zum Gutenberg was a German goldsmith, printer and publisher who introduced modern book printing. His invention of mechanical movable type printing started the Printing Revolution and is widely regarded as the most important event of the modern period. It played a key role in the development of the Renaissance, Reformation and the Scientific Revolution and laid the material basis for the modern knowledge-based economy and the spread of learning to the masses.

Gutenberg was the first European to use movable type printing, in around 1439, and the global inventor of the printing press. Among his many contributions to printing are: the invention of a process for mass-producing movable type; the use of oil-based ink; and the use of a wooden printing press similar to the agricultural screw presses of the period. His truly epochal invention was the combination of these elements into a practical system which allowed the mass production of printed books and was economically viable for printers and readers alike. Gutenberg's method for making type is traditionally considered to have included a type metal alloy and a hand mould for casting type.

The use of movable type was a marked improvement on the handwritten manuscript, which was the existing method of book production in Europe, and upon woodblock printing, and revolutionized European book-making. Gutenberg's printing technology spread rapidly throughout Europe and later the world.

His major work, the Gutenberg Bible (also known as the 42-line Bible), has been acclaimed for its high aesthetic and technical quality.

Early life

Gutenberg was born in the German city of Mainz, the youngest son of the upper-class merchant Friele Gensfleisch zur Laden, and his second wife Else Wyrich, who was the daughter of a shopkeeper. According to some accounts Friele was a goldsmith for the bishop at Mainz, but most likely he was involved in the cloth trade. Gutenberg's year of birth is not precisely known but was most likely around 1398. John Lienhard, technology historian, says "Most of Gutenberg's early life is a mystery. His father worked with the ecclesiastic mint. Gutenberg grew up knowing the trade of a goldsmith."

In 1411, there was an uprising in Mainz against the patricians, and more than a hundred families were forced to leave. As a result, the Gutenbergs are thought to have moved to Eltville am Rhein (Alta Villa), where his mother had an inherited estate. According to historian Heinrich Wallau, "All that is known of his youth is that he was not in Mainz in 1430. It is presumed that he migrated for political reasons to Strassburg (Strasbourg), where the family probably had connections." He is assumed to have studied at the University of Erfurt, where there is a record of a student, in 1419, named Johannes de Alta villa.

Nothing is now known of Gutenberg's life for the next fifteen years, but in March 1434, a letter by him indicates that he was living in Strassburg, where he had some relatives on his mother's side. He also appears to have been a goldsmith member enrolled in the Strassburg militia. In 1437, there is evidence that he was instructing a wealthy tradesman on polishing gems, but where he had acquired this knowledge is unknown.

Printing press



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Gutenberg with his printing press

Around 1439, Gutenberg was involved in a financial misadventure making polished metal mirrors (which were believed to capture holy light from religious relics) for sale to pilgrims to Aachen: in 1439 the city was planning to exhibit its collection of relics from Emperor Charlemagne but the event was delayed by one year and the capital already spent could not be repaid. When the question of satisfying the investors came up, Gutenberg is said to have promised to share a "secret". It has been widely speculated that this secret may have been the idea of printing with movable type. Legend has it that the idea came to him "like a ray of light".

At least up to 1444, he lived in Strassburg, most likely in the St. Arbogast suburb. It was in Strassburg in 1440 that Gutenberg perfected and unveiled the secret of printing based on his research, mysteriously entitled *Kunst und Aventura* (art and enterprise). It is not clear what work he was engaged in, or whether some early trials with printing from movable type may have been conducted there. After this, there is a gap of four years in the record. In 1448, he was back in Mainz, where he took out a loan from his brother-in-law Arnold Gelthus, presumably for a printing press. Gutenberg may have been familiar with printing; it is claimed that he had worked on copperplate engravings with an artist known as the Master of the Playing Cards.

By 1450, the press was in operation, and a German poem had been printed, possibly the first item to be printed there. Gutenberg was able to convince the wealthy moneylender Johann Fust for a loan of 800 guilders. Peter Schöffer, who became Fust's son-in-law, also joined the enterprise. Schöffer had worked as a scribe in Paris and is believed to have designed some of the first typefaces.

Gutenberg's workshop was set up at Hof Humbrecht, a property belonging to a distant relative.

It is not clear when Gutenberg conceived the Bible project, but for this he borrowed another 800 guilders from Fust, and work commenced in 1452. At the same time, the press was also printing other, more lucrative texts (possibly Latin grammars). There is also some speculation that there may have been two presses, one for the pedestrian texts, and one for the Bible. One of the profit-making enterprises of the new press was the printing of thousands of indulgences for the church, documented from 1454-55. In 1455 Gutenberg published his 42-line Bible, known as the Gutenberg Bible. About 180 were printed, most on paper and some on vellum.

Later life

In January 1465, Gutenberg's achievements were recognized and he was given the title Hofmann (gentleman of the court) by von Nassau. This honor included a stipend, an annual court outfit, as well as 2,180 liters of grain and 2,000 liters of wine tax-free. It is believed he may have moved back to Mainz around this time, but this is not certain. Gutenberg died in 1468 and was buried in the Franciscan church at Mainz, his contributions largely unknown. This church and the cemetery were later destroyed, and Gutenberg's grave is now lost.

In 1504, he was mentioned as the inventor of typography in a book by Professor Ivo Wittig. It was not until 1567 that the first portrait of Gutenberg, almost certainly an imaginary reconstruction, appeared in Heinrich Pantaleon's biography of famous Germans.

Printed books



Gutenberg Bible

Between 1450 and 1455, Gutenberg printed several texts, which are not known; his texts did not bear the printer's name or date, so attribution is possible only through external references. Certainly several church documents including a papal letter and two indulgences were printed. Some printed editions of *Ars Minor*, a schoolbook on Latin grammar by Aelius Donatus may have been printed by Gutenberg; these have been dated either 1451-52 or 1455.

In 1455 (possibly starting 1454), Gutenberg brought out copies of a beautifully executed folio Bible (*Biblia Sacra*), with 42 lines on each page. The pages of the books were not bound, and the date 1455 is documented on the spine by the binder for a copy bound in Paris. The Bible sold for 30 florins each, which was roughly three years' wages for an average clerk. Nonetheless, it was significantly cheaper than a handwritten Bible that could take a single scribe over a year to prepare. After printing the text portions, each book was hand illustrated in the same elegant way as manuscript Bibles from the same period written by scribes. 48 substantially complete copies are known to exist, including two at the British Library that can be viewed and compared online. The text lacks modern features such as pagination, indentations, and paragraph breaks.

An undated 36-line edition of the Bible was printed, probably in Bamberg in 1458-60, and possibly by Gutenberg. A large part of it was shown to have been set from a copy of Gutenberg's Bible, thus disproving earlier speculation that it may have been the earlier of the two.

Printing method with movable type

Gutenberg's early printing process, and what tests he may have made with movable type, are not known in great detail. His later Bibles were printed in such a way as to have required large quantities of type, some estimates suggesting as many as 100,000 individual sorts. Setting each page would take, perhaps, half a day, and considering all the work in loading the press, inking the type, pulling the impressions, hanging up the sheets, distributing the type, etc., it is thought that the Gutenberg-Fust shop might have employed as many as 25 craftsmen.

Gutenberg's technique of making movable type remains unclear. In the following decades, punches and copper matrices became standardized in the rapidly disseminating printing presses across Europe. Whether Gutenberg used this sophisticated technique or a somewhat primitive version has been the subject of considerable debate.

In the standard process of making type, a hard metal punch (with the letter carved back to front) is hammered into a softer copper bar, creating a matrix. This is then placed into a hand-held mould and a piece of type, or "sort", is cast by filling the mould with molten type-metal; this cools almost at once, and the resulting piece of type can be removed from the mould. The matrix can be reused to create hundreds, or thousands, of identical sorts so that the same character appearing anywhere within the book will appear very uniform, giving rise, over time, to the development of distinct styles of typefaces or fonts. After casting, the sorts are arranged into type-cases, and used to make up pages which are inked and printed, a procedure which can be repeated hundreds, or thousands, of times. The sorts can be reused in any combination, earning the process the name of "movable type".

Legacy

Martin Luther's 95 Theses sparked off the Reformation in 1522. Within the span of only two years, Luther's tracts were distributed in 300,000 printed copies throughout Germany and Europe. Although Gutenberg was financially unsuccessful in his lifetime, the printing technologies spread quickly, and news and books began to travel across Europe much faster than before. It fed the growing Renaissance, and since it greatly facilitated scientific publishing, it was a major catalyst for the later scientific revolution.

The capital of printing in Europe shifted to Venice, where visionary printers like Aldus Manutius ensured widespread availability of the major Greek and Latin texts. The claims of an Italian origin for movable type have also focused on this rapid rise of Italy in movable-type printing. This may perhaps be explained by the prior eminence of Italy in the paper and printing trade. Additionally, Italy's economy was growing rapidly at the time, facilitating the spread of literacy.

Printing was also a factor in the Reformation. Martin Luther's 95 Theses were printed and circulated widely; subsequently he issued broadsheets outlining his anti-indulgences position (certificates of indulgences were one of the first items Gutenberg had printed). The broadsheet contributed to development of the newspaper.

In the decades after Gutenberg, many conservative patrons looked down on cheap printed books; books produced by hand were considered more desirable. Today there is a large antique market for the earliest printed objects. Books printed prior to 1500 are known as **incunabula**. There are many statues of Gutenberg in Germany, including the famous one by Bertel Thorvaldsen (1837) in Mainz, home to the eponymous Johannes Gutenberg University of Mainz and the Gutenberg Museum on the history of early printing. The latter publishes the *Gutenberg-Jahrbuch*, the leading periodical in the field.





Gutenberg monument in Mainz (1837) by Thorvaldsen

Project Gutenberg, the oldest digital library, commemorates Gutenberg's name. In 1961 the Canadian philosopher and scholar Marshall McLuhan entitled his pioneering study in the fields of print culture, cultural studies, and media ecology, *The Gutenberg Galaxy: the Making of Typographic Man*. Gutenberg remains a towering figure in the popular image. In 1999, the A&E Network ranked Gutenberg No. 1 on their "Biographies of the Millennium" countdown. In 1997, *Time-Life* magazine picked Gutenberg's invention as the most important of the second millennium.

"What the world is today, good and bad, it owes to Gutenberg. Everything can be traced to this source, but we are bound to bring him homage, for the bad that his colossal invention has brought about is overshadowed a thousand times by the good with which mankind has been favored."

American writer Mark Twain (1835?1910)