

## ***Part Two: Gutenberg and the Incunabulists***

Less is known of Gutenberg than you might expect of a man whose discoveries changed the world. Gutenberg is believed to have been born in Mainz in 1397. His father held a position of authority at the local mint, where coin molds were made by stamping the design of the coin into metal with a steel punch.

Although Gutenberg lived in for a time in Strasbourg and may have worked on his ideas there, he returned to Mainz around 1446. This is where he produced most of the work attributed to him, including his masterwork, a beautiful edition of the Bible referred to as the 42-Line, or Mazarin, Bible. Fifty-one complete copies still exist, twelve on vellum and thirty-nine on paper, enduring symbols of the axis on which the Western world turned from the Middle Ages to the modern.

Gutenberg died in 1468 after losing his original business to his backers and building a second. He was recognized even by his contemporaries as man whose innovations were far-reaching.

Gutenberg is popularly credited with the invention of printing, but printing from woodblocks was an established business prior to the 15th century<sup>1</sup>, with playing cards, devotional prints, and printed cloth widespread. (Chappell, 8ff) Gutenberg's accomplishments were primarily in typesetting:

- Molds in which type of precise size could be cast repeatedly
- Punches from which molds could be made
- Special metal alloys for casting the type
- Systems for sorting and storing type
- Forms for composing and holding the type
- Oil-based inks which worked with his type and press
- A special press, adapted from a wine press.

It's worth noting that Gutenberg's innovations were not exclusively technical ; they were also esthetic. He hopped his mechanical system for duplicating the written word would yield products as well-designed as the best calligraphy, and consistent—consistently error-free, evenly-spaced, ruled straight, and so forth—in order to succeed.

He was competing against a high standard. He needed to design type as clear as professional calligraphy, and had to compose the type in a way that made his printed pages pleasant to view and easy to read. This required him to “discover” elements of typography that no one had ever considered before, such as kerning and leading, and to find technical solutions to these challenges.

Used together, his advances allowed *printing using moveable type*, the textbook definition of Gutenberg's combination of achievements.

Paper was one key ingredient in this recipe. Papyrus is too flimsy to use in a press, and parchment is too expensive to use in quantity (though Gutenberg did use parchment for special editions). This means that printing could not have developed in Europe prior to the arrival of papermaking in the 13th century.

The second, and more important, key to Gutenberg's success was the ability to produce type of consistent size. Because each piece of his type was the same precise size, assembled type could be

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<sup>1</sup>Some authorities believe that woodblock printing was brought to Europe from Asia by Marco Polo. Surviving examples of Japanese woodblock prints date from the 8th century. (Chappell, 8)

held level in a tightened frame, and pressed evenly across the printed sheet. This would be impossible if the size of the type varied.

The molds in which Gutenberg cast his type were created by punches—the same sort of punches used at the mint where his father worked. Perhaps we have Gutenberg's childhood exposure to the punches at the mint to thank for his inspiration... perhaps his craft as a metal smith. Most likely his primary motivation was financial: he recognized significant opportunity in producing large numbers of identical documents. Consistent quality and absence of error were his initial selling points. But demand for his products—which included indulgences (pardons from sin which were granted in exchange for contributions to the church) as well as books such as bibles and psalters—turned out to be higher than he had anticipated, even if the demand didn't materialize in time to satisfy his investors.

In Gutenberg's footsteps came rapid growth in the number of printers and printed products. Printers who worked during the infancy of the trade—those who produced work during the 15th century—are referred to as *incunabulists*, from the Latin word for cradle, *incunabula*. Their numbers swelled as the potential of publishing as a profitable business was quickly recognized. Understandably, scribes' guilds put up significant resistance to the new technology, urging strict enforcement of laws prohibiting reproduction of images. But they may as well have tried to stop the tide.

Gutenberg was not the first to apply the principle of moveable type in printing. Similar printing had been accomplished in Asia, as early as the 11th century in China (using moveable woodblocks), in the 14th century in Korea (using moveable bronze type), and in Japan in the late 16th century. What made printing practical in 15th century Europe and impractical in Asia was not technological or cultural superiority in any way, but rather the difference in writing systems. (McMurtrie, 84ff)

There are thousands of characters in Chinese writing, and only about two dozen letters in the European alphabets. The sheer volume of characters posed an obstacle to the development of printing using moveable type in China which wasn't overcome until the end of the 19th century.

Influenced by imported Sanskrit texts, Korean scholars developed a phonetic writing system in the 15th century. Unfortunately, tradition demanded inclusion of Chinese ideographs along with the Korean symbols, which ultimately made printing as unwieldy in Korean as in Chinese. Printing with moveable type ceased in Korea in the mid-16th century (though revived briefly in the 18th century). (McMurtrie, 99)

Although the Japanese had also developed a phonetic writing system, that country's experimentation with moveable type ended after about 30 years. (McMurtrie, 99)

It's from Gutenberg that we draw a direct line to today's global printing industry. His efforts established Mainz as a printing center, attracted widespread notice, and had an almost immediate effect on Western culture, a revolutionary effect that continued for centuries and continues to this day. It's not an exaggeration to say that what Gutenberg introduced underpins much of the evolution of subsequent technology and Western thought. The press made possible both the creation of a mass audience and rapid change in the social structure. Consider some other changes which the adoption of printing brought.

*Introduction of standardized mass production.* Save for blemishes or accidents, each document which came off Gutenberg's press was identical, and the same product could be replicated time and time again. The printing press was one of the first widely-adopted machines from which unlimited, identical copies could be made. This

provided an example for future manufacturers, and a paradigm for the industrial revolution.

*Mass communication.* Until the invention of the printing press a writer's audience was necessarily limited. Printing was the first medium of communication that enabled communication to many people in different locations.

*Literature in the vernacular.* One reason why most writing prior to the invention of the printing press was in Latin was because contemporary spoken languages such as English or German—the vernacular—varied considerably across relatively short distances, with vocabulary and pronunciation highly regionalized, and spelling mostly improvisational. The development of printing shaped the standardization of written language, and as more and more material was printed in the vernacular, people began to communicate more widely.

*Universal literacy.* Until the development of the printing press, literacy rates were largely governed by the availability of writing; that is, relatively few people were taught how to read because there was relatively little writing to be read. As books became more common, the ability (and the desire) to read grew widespread. It also became increasingly clear that higher literacy rates benefited society and that broadly available secular education was both desirable and possible.

*Popular access to knowledge and the arts.* As writing became more accessible, learning became less easy to control. Knowledge was applied in unexpected ways, by people who would not have had access to it in the world before printing.

*The Reformation.* Would Martin Luther's challenge to the established church have succeeded to the same extent in the absence of mass communication? It was probably not by chance that Luther's movement began within decades of the invention of printing: it was fueled by rising literacy and an explosion in communication. Luther's writings dominated the German press of the early 16th century: it's been estimated that one third of all the books printed in Germany between 1518 and 1525 were by Luther.

*The Renaissance.* The Renaissance was a period in which classical knowledge was rediscovered, and humanism grew and flourished. It began well before the development of printing and continued after printing became commonplace. But the contribution that printing made to spreading the ideas of the Renaissance, and the empowerment of the individual that literacy and access to knowledge bring, made printing both an agent of the Renaissance and an embodiment of its ideals.

*Writing in new genres.* As the market for printed material broadened, new types of writing developed. What may be the world's first novel, *The Life of Lazarillo de Tormes*, appeared in Spain in 1554. Montaigne, the first essayist, began writing in 1571. And some early publishers saw that current events could be broadly communicated in print as easily as anything else. This new notion of journalism was almost immediately recognized by European governments as potentially dangerous.

*Illustration of the principle that demand for knowledge will rise to meet the supply.* Warren Chappell said, "As the tool of literacy, the press created its own clientele." (175) The incunabulists perceived their markets as limited, with relatively low demand for a relatively small amount of material. Yet demand grew, and continues to grow. Once the door to mass communication and abundant knowledge was opened in the 15th

century, all the effort in the world could not close it. And this two-sided principle—that demand for information in print will continue to rise proportionate to the ability to supply it, and will continue to rise no matter how much is supplied—is one we will see repeated again and again as we look more closely at journalism.

It's been said that an average public library today could easily hold all the books that existed in the world in 1450. Fifty years later—by 1500—more than 12,000,000 books had been printed, in more than 35,000 editions.

Printing spread rapidly and steadily following its introduction. By 1470 there were printers in 14 cities. By 1480, the number had risen to 100. By the end of the century there were printers in more than 200 cities throughout Europe.

This table shows the first year that material was printed in Western type in a given location.

Year	Country
~1450	Germany
1467	Switzerland
1469	Italy
1470	France
1473	Holland
1473	Belgium
1474	Spain
1477	England
1503	Turkey
1508	Rumania
1515	Greece
1534	Mexico
1550	Ireland
1553	Russia
1556	India
1563	Palestine
1584	Peru
1590	Japan
1602	Philippines
1610	Bolivia
1639	Massachusetts Bay
1640	Iran
1642	Finland
1643	Norway
1644	China

(Chappell 64, 67, 72f, 84, 113)