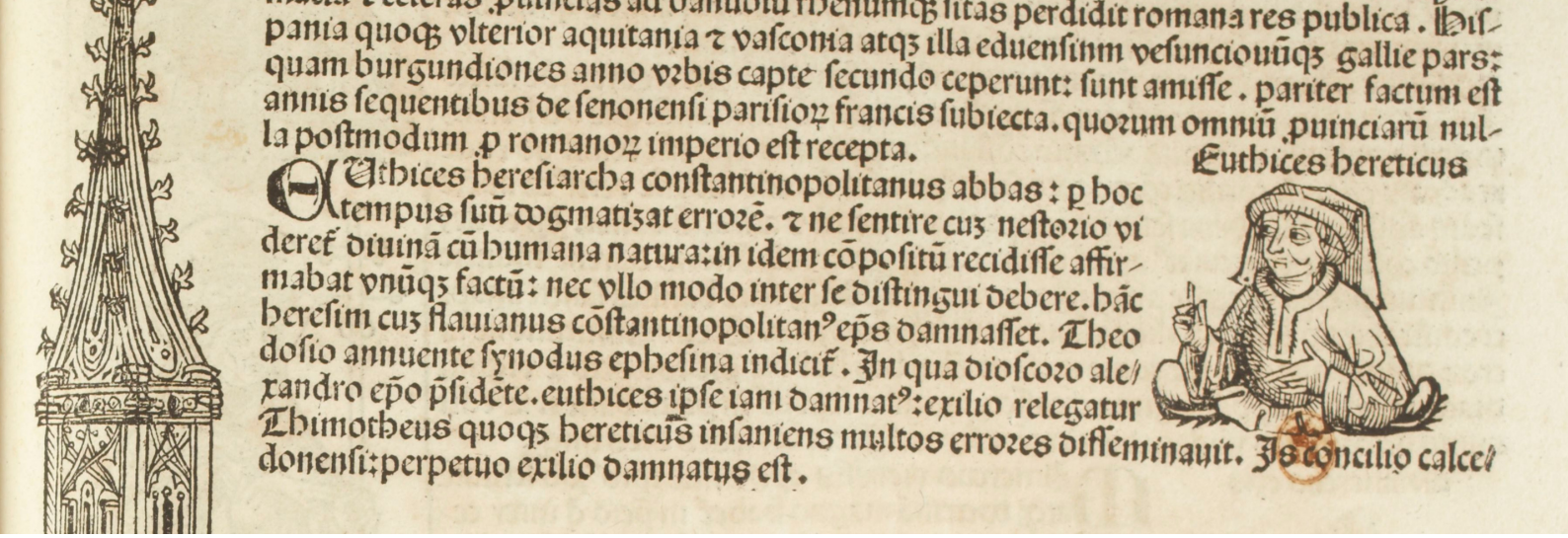


Fig. 1: Bibliothèque nationale de France, département Estampes et photographie, RESERVE FOL-QE-55, f. 139v- 140r
***Cronica cronicarum ab Initio Mundi*, The Nuremberg Chronicles, Hartmann Schedel (author), Nuremberg, 1493**

For a closer look:
https://gallica.bnf.fr/ark:/12148/btv1b8490060t/f311.item.zoom

MEDIEVAL BOOK PRODUCTION:

MANUFACTURING THE PRINTED BOOK

Printing with movable type was perfected in the 1450's in Mainz, Germany by Johann Gutenberg (c. 1398-1468) and his two associates, Johann Fust and Peter Schoeffer. This innovation allowed for the mass reproduction of texts and high quality printed books, at a moment of radical change in Western Europe. The printing press which at the beginning may seem to have been a mere symptom of Europe's rapidly expanding population and economy, of its industrialization, and its changing social structures, quickly became the means by which all of these changes took place.

By the end of the 11th century, manuscript books had evolved from being almost exclusively produced and used by monks living in countryside monasteries to being fabricated and sold in urban settings. This development went hand in hand with the creation of the first universities, the centralization of royal power in certain cities, the development of trade and the birth of a new social class: the urban *bourgeoisie*. Medieval cities thus became perfect settings where people exchanged merchandise, texts, experiences, ideas and techniques. And documents became ever more necessary in order to keep track of these exchanges. Growing population density resulted in growing networks of trade, commerce and travel. The establishment of new maritime routes and bigger ships during the 13th and 14th centuries, as well as the increasing number of travelers (either for trade or for pilgrimage) turned medieval Europe into a truly international and multilingual place.

Having success in this new capitalist urban economy was often linked to one's capacity to quickly receive, manage and pass on information; a certain competence in reading and writing thus became necessary. By the 1450's, about 10 to 15% of the population of Western Europe knew how to read and write and many possessed books purchased either for work, for pleasure or for private devotion. New techniques in metalwork, as well as the expansion of the paper and ink industries accompanied this increasing demand. By the year 1520, perfectly curated editions (in Latin and vernacular) were being printed in every important European city. Literacy had become, in fact, the stepping-stone of medieval Europe's grand entrance into modern times.

Author: Paloma Pucci

Fig. 2 (below) : Title page with an illumination representing a printing press. By Etienne Colaud, Geoffroy Tory and Simon de Colines.

Bibliothèque nationale de France. Bibliothèque de l'Arsenal, 8°T.2547
The Roman Hours, Paris, January 16, 1525

For a closer look:
https://gallica.bnf.fr/ark:/12148/btv1b86261506/f7.item.r=T%6202547#

Fig. 3 : Early modern wine press

It is believed that Gutenberg was inspired by the latest technical developments in the wine press, modifying one in 1438 to create his own printing press.

SETTING THE SCENE: AN EXPANDING MEDIEVAL BOOK TRADE

During the 13th and 14th centuries, monastic ***scriptoria***, which had been in charge of book production for centuries, were no longer able to keep up with an ever-growing demand for books. In fact, reading and book production had broken away from the world of convents and monasteries and had expanded within universities and urban markets, producing manuals for the education of the clergy, bibles and treatises on law and theology for the student population, and romances on chivalry and adventure for an aristocratic and bourgeois public.

To keep up with the demand, urban and monastic workshops reorganized and redistributed their tasks, which allowed them to make more conform copies in a shorter period of time, and to sell them from stock. However, handwritten books on parchment, were still very expensive and not accessible to a grand majority. In fact, an increasing number of lay men and women were not only becoming alphabetized, but they were also acquiring the economic means to buy their own books, which meant that not only aristocrats were buying books for enjoyment or personal devotion, but merchants were doing so as well.

The rise of this new alphabetized middle class coincided with a certain development of private devotional practices, known as the *Devotio Moderna*, spreading from the Low Countries. In fact, the emphasis placed on the individual power that one could exert towards one's own salvation led to a feeling of responsibility over personal affairs, as well as the adoption of certain reading practices that would allow to ensure one's future (not only in heaven but also on earth).

These new pious practices led to the mass-printing from woodblocks (xylography), creating thousands of copies of devotional images and even illustrated books of limited size, that prioritized image over text. These printing techniques were relatively cheap, itinerant, and needed no great material investment. In fact, by the time Gutenberg started to develop his new printing system in the 1440's (setting up shop in Mainz in 1450), most medieval Europeans had already been exposed to printing in one way or another.

In this context, Gutenberg's movable type system resulted from a series of technical innovations (based on pre-existing traditional practices) without which it would not have come into fruition: the expansion of the paper industry, the evolution of the wine press, the development of a new type of oil-based ink and, finally, the popularity of woodblock printing for the mass-production of printed images.

PAPER

Paper was invented in China in the 2nd century BC and had been in use in Europe since the 11th and 12th centuries (first in Italy, then Spain and the South of France and, finally, around the 1400's, in what is now modern-day Germany). In China, paper could be made out of hemp, rattan, rice straw or bamboo. In Europe, it was made by mashing linen, hemp or cotton fibers in water through the continuous movement of mill-powered mallets. Once the fibers were reduced to a pulp, they were extracted by using a sieve-like screen (usually embedded with the manufacturer's motif), pressed on a piece of felt to remove the excess humidity, and strung up to dry. Once the sheet was dry, it would receive a hand of glue that renders it impermeable. The resulting sheet of paper would show the grainy texture of the screen it was pressed against as well as the motif or **watermark** of its manufacturer's workshop. These watermarks allow us to trace how far paper could travel from where it was produced to where it was printed on.

The fast-developing paper industry during the Middle Ages is evidence of a large demand for books that parchment alone could not satisfy. Paper availability in Europe facilitated the fast expansion of manuscript production in the 15th century, providing large quantities of paper, a writing support that proved to be faster to make, lighter, more flexible, and less expensive than parchment.

FROM WOODBLOCK PRINTING TO MOVABLE TYPE

While it is true that woodblock printing greatly developed with the printing press, impressions from stamps or wood blocks were already being produced since the first half of the 14th century. Xylography or woodblock **relief printing** (where the protruding surface contains the image that will be printed onto the support) had existed in East Asia for printing on textiles as well as on paper since the 2nd century AD, and had been practiced for several centuries in China, Japan and Korea. In fact, the oldest known printed book is The Diamond Sutra, a buddhist book printed in China in c. 868 AD.

In Europe in particular, books were already being illustrated by means of printed images as early as the final years of the 14th century, however, most extant engravings were stamped in the early 15th century on separate sheets of paper and consisted of pious images for personal devotion, as well as illustrations pressed onto playing cards.

Fig. 6 (above): Reproduction of 15th century playing cards from Lyon, from engraved wood plates.

Les cartes à jouer du XIVe au XXe siècle, by Henry-René d'Allemagne, Paris, 1906, p. 17

For a closer look: https://gallica.bnf.fr/ark:/12148/bpt6k15234148/f55.item

In the second half of the 15th century, so-called block books appeared, in which one whole page, containing both text and image, would be engraved onto a single block of wood. These xylographic prints were usually short religious books, like the *Biblia Pauperum* **(Fig. 7)**, the *Speculum humanae salvationis* (Mirror of Redemption), and the illustrated Apocalypse, and were aimed at popular audiences. Along with devotional prints they were mass-produced for pilgrimages and important public events. They were printed in brown or gray water-based ink, using a rubbing motion instead of pressing, and illustrations would be colored in by

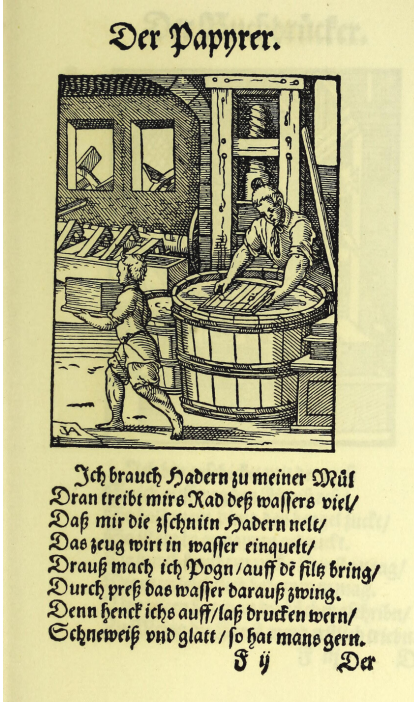


Fig. 5 (above): The first representation of the printing process is found in the Little Book of Trades by Jost Amman, printed in 1568. In this image, the paper maker is about to dip his sieve screen into a tub full of cotton and linen fiber diluted in water. Outside the window, the mills set the mallets in motion, which then mash the fibers into a pulp.

1884 facsimile of Stände und Handwerker, by Jost Amman, Frankfurt, 1568

For a closer look:
https://wellcomecollection.org/works/y52ug5tb/items?canvas=53

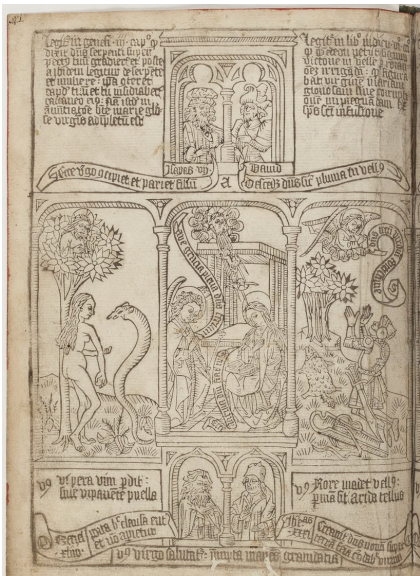
Fig. 4 (bottom left) : A money lender is weighing jewels and pieces of gold while his wife sits next to him, reading a book of devotion (probably a **book of hours**) with an illustration of the Virgin and Child. They are not dressed as members of the high aristocracy but as members of the merchant class of the city of Antwerp, where this painting was made. They are part of a new alphabetized social class, and their home library (just behind them) probably consists of books that help them manage their affairs, as well as texts for private devotion.

The Money Lender and His Wife, Quentin Massys, 1514

Fig. 7 (below) : The first page of this Bible for the Poor has been carved entirely on one sole wooden plate. In this type of Block books, which had great success in both France and Germany during the second half of the 15th century, images were paired with short texts, associating episodes from the Old Testament to events from the New Testament.

Bibliothèque nationale de France, département Réserve des livres rares, XYLO-2, p. 1
Biblia Pauperum, Netherlands, 1462-1468

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k1040368w/f12.item.r=biblia%20pauperum



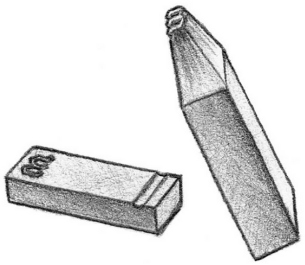


Fig. 8: Punch (right) and matrix (left), necessary for casting individual metal pieces of type.

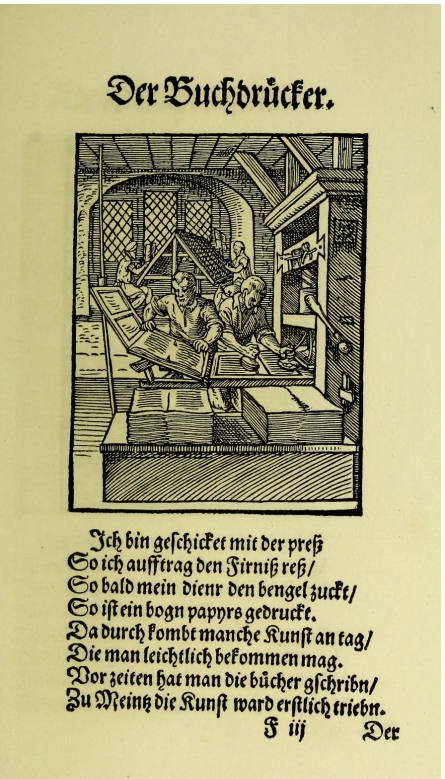
Fig. 9 (above): A printing form, consisting of movable pieces of type.

Fig. 10 (below):

In this image from the Little Book of Trades by Jost Amman, printed in 1568, the inker and the printer are represented at work. Behind them, two compositors sit in front of their *visorium*, preparing the matrices.

1884 facsimile of Stände und Handwerker, by Jost Amman, Frankfurt, 1568

For a closer look:
https://wellcomecollection.org/works/y52ug5tb/items?canvas=55



hand after printing. However, woodblock printing had a certain number of limitations, which Gutenberg's movable type system saw to overcome. To begin with, printing on both sides of a sheet of paper was impossible. The rubbing motion that was needed in order to transfer the ink onto the other side of the page would damage the existing image, meaning that for every couple of printed pages, two had to be left blank and then be pasted together in order for the text to be continuous.

One of Gutenberg's greatest innovations was to use a press for printing. Having come from a wine-producing area of Germany, he probably knew how the wine press functioned and thought of modifying it for fast and repetitive printing. This system not only saved time but also cut down costs, because it allowed text to be printed on both sides of the paper.

Another important limitation to printing before Gutenberg's system was the cost and durability of wooden blocks. Each page needed its own engraved wooden plate which could only render a good quality print for a limited amount of times before it had to be replaced, since wood is a relatively soft material that could easily expand and contract with changes in temperature and humidity (as well as break under the immense pressure of a press). This meant larger production costs as well as longer production time.

Being professional goldsmiths, Gutenberg and his associates, Fust and Schoeffer, replaced wood with metal, a more durable material that would better resist applied pressure and have a longer shelf life. Moreover, rather than creating an entire page out of a single metal plate. Gutenberg decided to mold minuscule individual type pieces from a molten alloy of lead, tin and antimony, the perfect combination of which took long to obtain. These individual type pieces were easily reproducible and the process was simple: a minuscule letterform would be carved onto the point of a hard metal punch. This punch would then be hammered into a matrix made of a softer metal, leaving an imprint. This imprint would be embedded into a mold into which the molten alloy could then be poured, making as many copies of the letterform as necessary.

Both uppercase (capital) and lowercase (minuscule) types had to be molded for each letter, as well as all punctuation symbols, **diacritical signs**, abbreviations, **ligatures**, etc., and Gutenberg went as far as carving different versions of the same letters so as to imitate the imperfections of hand-written text. These types could not only be mass produced, but also arranged in endless combinations on a frame, and be used and reused for as many projects as necessary; making printing faster and more economically viable.
The innovation of Gutenberg's movable type system lay in three fundamental aspects: the use of metal instead of wood, the decomposition of the text into individual and movable letterforms, and the use of a press to imprint the text onto its support.

A NEW TYPE OF INK

Before the development of the printing press, ink was water-based and would dry into a brownish hue, and because of its consistency and the rubbing technique that it required to imprint on the page, double-sided printing was impossible.

In order for Gutenberg's new system to work properly, it became necessary to develop a new type of ink. In fact, water-based inks would easily run off the metallic surface of his letterforms, whereas an oil-based dyeing substance (resembling more a varnish or oil paint) would stick more easily to the surface of the metal types. This new ink consisted of a reduction of carbon, nut oil and turpentine, containing copper, lead, titanium, and sulphur. The high metallic content of this first recipe (present only up until 1473) made for a shiny reflecting black surface.

THE TRADE

Different sorts of expertise went into the fabrication of the printed book, and an important part of Gutenberg's system was the development of a series of protocols that organized the different tasks. Two important figures emerged: the compositor and the printer.

Conform copies of manuscripts and corrected texts circulated among intellectuals and editors in large urban centers such as Venice, Cologne or Paris. Establishing a workshop in one of these big cities was fundamental in order to have access to different texts as well as to the corrections that these savants could provide. Manuscripts could also be borrowed from monastic libraries in order to prepare certain editions, and would be given back to the owning institution accompanied by a printed copy.

Once the **compositor** or **typographer** received the correct and conform copy of a given text, his task consisted of calculating the length of the copy, including the establishment of the total number of pages. Once the length had been calculated, the original text would be placed on a surface called a ***visorium***, which propped up the text in front of the compositor and over a flat compartmentalized box inside of which he would arrange the individual letterforms that would form his lines of type. This task meant that the compositor had to be able to read. The compositor would then, by means of a pair of tweezers, place each metal piece of type, one by one, in its corresponding place, line after line. He would help himself with a ruler-like instrument that ensured that each line of type had the same length. In order for all lines to be justified within the required length, he would apply larger or smaller 'spaces', as well as abbreviations (which tended to become more or less frequent as he approached the end of each line).

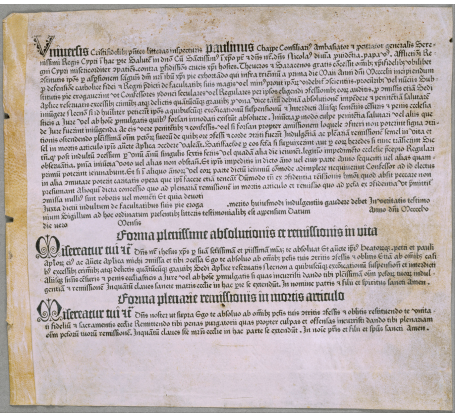
Some texts were divided among different compositors. Many manuscript exemplars show the markings that were left to guide each compositor's work, allowing us (and the printer) to know up until what point each compositor had worked, helping to establish each compositor's retribution. This type of work distribution meant that with each new edition, no matter how precise the compositors' work, variations and errors could easily slip into the text. In the first printed copies, we often find that such errors were simply corrected with pen and ink, a custom that slowly evolved into an ***erratum***, a page at the back of the book containing all errors present in the edition.

Once a good number of pages had been composed and corrected (which depended on the available number of letterforms present at any given workshop), the type frames were ready for the press. For this, a sheet of paper (or, less frequently, parchment), would be folded as many times as necessary in order to match the size of the frame, and humidified (this would allow it to better absorb the ink). This second part of the process involved the printer, who would make sure that all necessary paper was correctly humidified, and that the bowl where the ink was prepared was positioned close by, behind the press. The printing process actually required two people: one who would ink the type frame containing the text using ink balls or dabbers, aligning the sheet of paper under the press, and one who would operate the machine and press the paper onto the matrix.

Because the first printing press was unable to apply enough pressure in order to print more than one page per sheet, the process required the press to come down on the paper one time per page. Once one side of all the sheets of paper had been printed, the other side had to be completed as well. Printing on the other side of the page (or *verso*) had to occur within 72 hours in order to avoid the sheets of paper from drying completely and retracting. After each print, the paper had to be hung up to dry, after which it would be placed in a pile and flattened. A first test print run was necessary in order to allow the corrector (often an intellectual, a savant

Fig. 11 (below): Letter of indulgence for the expedition against the Turks and the defense of Cyprus, Johann Gutenberg, Mainz, 1455

https://artsandculture.google.com/asset/-AGY5HuGL5zCpg



or the author himself) to correct any faults and indicate any necessary modifications. This revised version would then be handed back to the compositor, who would modify the type frame before it could be re-printed.

Once all pages had been printed, the volume was ready to be assembled. All sheets were folded in half or ***in folio*** (making up two leaves or four pages) and gathered into quires and arranged according to the order indicated by their markings or signatures. Once folded, the 'books' (that is: sets of quires) would be stocked for sale, their binding generally taking place in a separate workshop and according to the taste and preferences of the buyer.

Gutenberg's innovative printing process allowed printers to print hundreds of pages a day as opposed to the two or three pages that a scribe could copy in the same amount of time.

THE GUTENBERG BIBLE

Although the first printed documents to come out of Gutenberg's workshop around the years 1450-1452 were Papal letters of indulgence (Fig. 11), Donatus' elementary grammar books, and calendars, his workshop's first truly ambitious project was Saint Jerome's *Vulgate*, a more accurate Latin translation of the Bible. The printing of this book, more commonly known as the **Gutenberg Bible** (Fig. 12) was the largest editing project of its time. It was printed in 180 copies (about 45 or 50 of which on **vellum**) in Mainz and in collaboration with his two associates and investors, Johann Fust and Peter Schoeffer, in 1455.

The text of the Gutenberg Bible was laid out in two columns, each one consisting of 42 lines (it is thus also known as the '42-line Bible' or the B 42). The type that was chosen resembled the gothic handwriting used in liturgical books of the time, known as **blackletter** or *textura quadrata* (because of how its vertical and horizontal lines give the impression of a woven texture). Moreover, due to Gutenberg's thick new oil-based ink, which caused a slight spread once each letter was pressed onto the paper, the "calligraphic" aspect of handwritten text was truly imitated.

The Gutenberg Bible was not printed in a single sequence from beginning to end. It was, in fact, composited in six different units, possibly reflecting the collaboration of six different compositors. In line with the medieval manuscript tradition, it had no title page, no date, no page numbers, and didn't credit the printer: Gutenberg's name does not appear in any of the extant copies of the Bible. In fact, the first printed book to be dated was the **Mainz Psalter**, made in 1457 in Fust's and Schoeffer's print shop, and which identifies itself as being made by a new "artificial invention for printing and reproducing characters" (*adventia artificiosa imprimendi ac caracterizandi*) (Fig. 13).

As with most early printed books made up until the year 1500 – also known as **incunables** or *incunabula* – Gutenberg's 42-line Bible was hand-finished and decorated, and was made to closely resemble a manuscript. In fact, Gutenberg's ambition was not to change the appearance of the manuscript book but to speed up its replication process, while at the same time making it more financially viable.

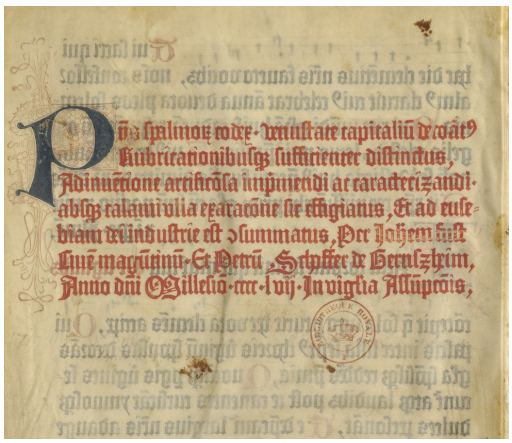


Fig. 13 (above): The last page of the Mainz Psalter, a book printed and decorated in black, blue and red ink, describes how it was fabricated with an "artificial invention for printing and reproducing characters" .

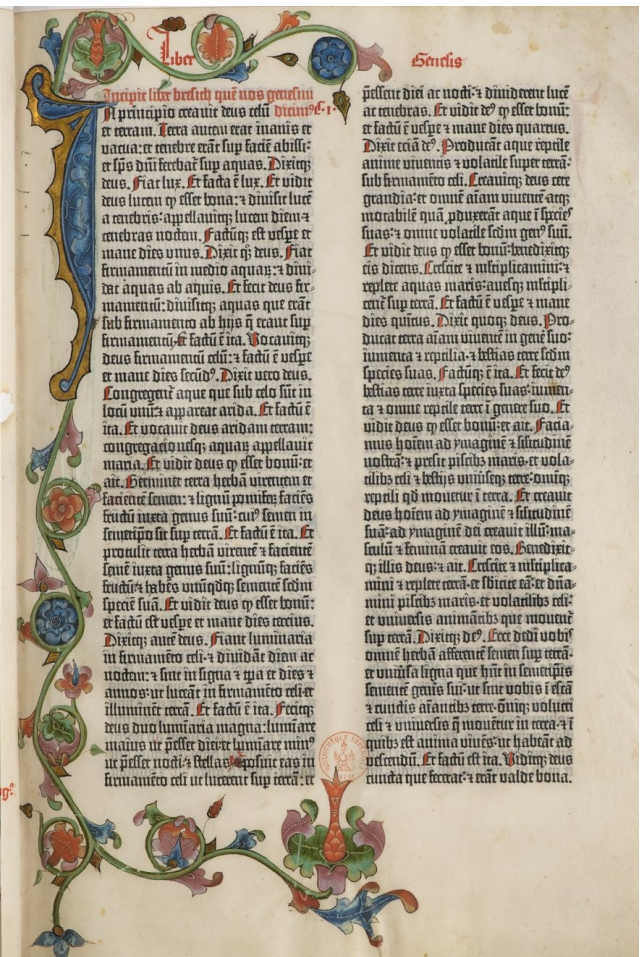
Bibliothèque nationale de France, département Réserve des livres rares, VELINS-223, f. 169v (detail)
Mainz Psalter, Mainz, 1457, Johann Fust and Peter Schoeffer

For a closer look: https://gallica.bnf.fr/ark:/12148/bpt6k994191w/f9.item

Fig. 12 (below): This page opens the Book of Genesis in one of Gutenberg's first printed bibles. It has been printed on vellum in both black and red ink. The initial "I" that commences the text is hand-painted after the print run, as are the flourishes that decorate the margins of the page. The page layout and the typeface closely imitate the aesthetics of a manuscript bible.

Bibliothèque nationale de France, département Réserve des livres rares, VELINS-67
Gutenberg Bible [Biblia latina] on vellum, Volume 1, Editors: Johann Gutenberg, Johann Fust, Mainz, 1455

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k9912811/f13.item



FROM MANUSCRIPTS TO PRINTING PRESS

Medieval readers were used to manuscripts, and weren't too comfortable with changing their traditional reading habits. Every detail in the book satisfied a need for visual structure and contributed to helping the reader identify and navigate the text as well as comprehend and memorize its contents. Following buyers' expectations, printed books were hence initially fabricated to resemble manuscripts and perfectly imitated the appearance of the hand-written book.

In fact, the typography used for the first printed books was directly copied from what was traditionally being used in manuscripts of that time. Late-medieval books used one of three distinct types of scripts according to the genre or category of the text. Liturgical manuscripts were written in **Gothic script**, vernacular texts in French were written in **French 'batarde' (Fig. 14)**, and classical and humanist texts used a new script that Italian humanists had adapted from the **Carolingian minuscule** for its elegant and airy module, the **Humanist minuscule (Fig. 15)**. The first typographers followed this tradition, giving each genre its traditionally appropriate typography.

Continuing to follow medieval manuscript tradition, the finishing touches of most incunables were applied by

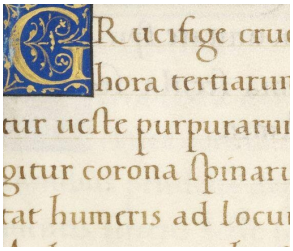


Fig. 15 : Humanist minuscule by the scribe Pierantonio Sallando

MSL/1902/1707 (Reid 64), f. 103r, 'Bentivoglio Hours', 1494-1503

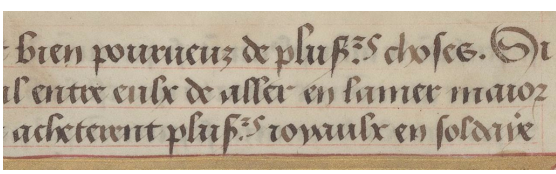


Fig 14 : French 'batarde'

Bibliothèque nationale de France. Bibliothèque de l'Arsenal. Ms-5219 réserve, f. 10r, The Book of Travels of Marco Polo, 1475-1525

hand, a practice that gradually diminished as printing techniques advanced. As with manuscripts, printed books also had spaces left empty for illustrations and decorations, initials (red and blue painted capitals), titles, rubrics, musical notations or words in other languages (Greek for example).

The layout of the chapter on Saint Andrew in three different editions of the **The Golden Legend** or *Legenda Aurea* by Jacobus of Varagine **(Fig. 16-18)** makes for a good example of how closely printed books followed medieval manuscript tradition in the early years of the printed press, as well as how they evolved over time. In a 14th century manuscript copy, the text is densely laid out, with ornate **rubricated letters** marking the first letter of each section. The first letter of each paragraph is also written in alternations of red and blue, and a great number of abbreviations have been used to allow the scribe to fit as much text onto the page as possible. A printed edition from 1475 has kept the same layout. The text is still arranged in two columns, with similarly ornate capital letters alternating colors and structuring the text. Although the same amount of abbreviations has been kept, the typeface is rounder and more airy, making the overall text easier to read.

Finally, a copy of the *Legenda Aurea* printed in 1499 clearly shows that the layout is progressively changing, becoming ever more similar to that of modern-day books. This last edition opens the chapter with an engraved image of Saint Andrew's martyrium. Here, the image is being used not only to indicate the beginning of the chapter but also as part of the text's structure. The page is still laid out in two columns, but it has become dense again, and color has been completely abandoned, with large black initials indicating the beginning of each paragraph. Although the text seems denser, it is much easier to read because there are fewer abbreviations and it is written in vernacular, making it available to a larger audience. The book as a whole is also easier to navigate because of its **foliation** (numbering of leaves).

Limitation and all-around suppression of color was the result of the growing need to produce cheaper books at a faster rate. As more and more print shops opened all over Europe, fierce competition led printers to standardize their processes on the one hand, while individualizing their product on the other. Like color, typography was also simplified as well as the text, which saw most of its abbreviations and ligatures eliminated. These modifications allowed printers to cut costs but drew the book farther away from its manuscript predecessor.

Although the book was becoming more standardized, each printer sought to make his production more attractive and easily recognizable. Some printers continued to imitate certain aspects of the manuscript, including ornate initials **(Fig. 19)**, others started including **title pages**, which became ever more common during the 16th century **(Fig. 20)**. These pages served as publicity, presenting the book in beautiful lettering as well as the printer's or bookseller's personal brand. They informed the reader about the book's provenance, its date of print, its author, translator, editor or commentator (if applicable), as well as the edition number.

Fig. 16-18 (above, from left to right): The golden Legend, *Legenda Aurea*, by Jacobus of Varagine

Bibliothèque nationale de France. Bibliothèque de l'Arsenal. Ms-1091 f. 9v, manuscript on parchment, 14th century

For a closer look:
https://gallica.bnf.fr/ark:/12148/btv1b55008902r/f24.item

Bibliothèque nationale de France. Département Réserve des livres rares, RES-H-292, f. 7r, printed on paper, 1475
Editor: Not mentioned

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k858662q/f25.item

Bibliothèque nationale de France. Département Réserve des livres rares, RES-H-1120 f. 7r, printed on paper, 1499
Nicolas de La Barre for Simon Vostre (editor)

For a closer look:
https://gallica.bnf.fr/ark:/12148/btv1b8604282b/f29.item

Fig. 19 : Following manuscript tradition, this ornate initial opens the prologue to the Livre de Mandevie.

Bibliothèque nationale de France, département Arsenal, RESERVE 4-BL-4355
Livre de bonne vie appelé Mandevie, Chambéry, 1485
Jean Dupin (author), Antoine Neiret (editor)

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k15113000/f11.item#

CENTERS OF PRODUCTION

The printing press developed in urban centers where there were thriving merchant, aristocratic and student populations. Gutenberg, for example, settled in Mainz, a border town as well as an episcopal town. It was a place of residence and of passage for important people (of both church and state), and it cultivated tight relations with Rome and the Imperial court. These circumstances played an important role not only in the development but also in the diffusion of the printing press.

In 1455, after a financial dispute over the production of the 42-line Bible, Gutenberg separated from his two associates (who had loaned him money for the completion of the project). The two men, Fust and Schoeffer, opened up a workshop of their own, and by the end of that year, two printing workshops existed in Europe: the successful Fust-Schoeffer print shop and the more modest Gutenberg print shop, both of which were located in Mainz, Germany.

However, the printing press designed by Gutenberg was dismountable, which allowed for printers to become itinerant, going from city to city following specific projects and clients. His system thus spread rapidly through the continent, and by the year 1500, Gutenberg's printing press could be found in about 270 cities across Europe, such Venice, Florence, Milan, Rome, Valencia, Paris, Basel and Frankfurt. Some cities had up to 30 or 40 print shops Venice at one time even 151 shops. The largest shop, however, was in Nuremberg which, in 1480, had 24 presses and employed about 100 people.

In 1465, two Germans called **Arnold Pannartz** and **Conrad Sweynheym** (known as Schweinheim), founded a print shop in the Benedictine monastery of Subiaco: the first

Fig. 21 (above): In this luxury edition of Le Guidon, printed on paper in middle French, the margins have been decorated by hand and enhanced with gold.

Bibliothèque nationale de France, département Réserve des livres rares, RES 4-TD73-260
Le Guidon de Guy de Chauliac, traduit en français par Nicolas Panis. Editors: Nicolaus Philippi eand Marcus Reinhart for Barthélemy Buyer, Lyon, 1478

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k9966376/f7.item#

movable type printing press established in Italy, and the second in Europe. Being lovers of antique culture and Italian humanism, in Subiaco, Schweinheim and Pannartz began to publish the first printed classical texts, subsequently opening shops in Rome (1467) and Venice (1469). In Rome they adopted a Roman type inspired from the Carolingian minuscule, whose legibility and clarity was much praised by Italian humanists because it contrasted with the thick and segmented traits of Gothic script, closely linked to 'medieval' culture. In fact, most printers had both Gothic and Roman types, and the choice of using one over another for any given text became a conscious cultural and social choice as well as a commercial strategy.

In Venice, on the other hand, the French printers **Jean de Spire** and **Nicolas Jensen** contributed to the evolution of the printed book, the latter in particular, introducing new types that were easier to read, among which the ***littera antiqua***, a version of the Roman type derived from the Caroline minuscule which he perfected, giving it its characteristic traits. He also had illustrations and decorations hand-painted into his printed books in order to imitate the quality and luxury of manuscript books.

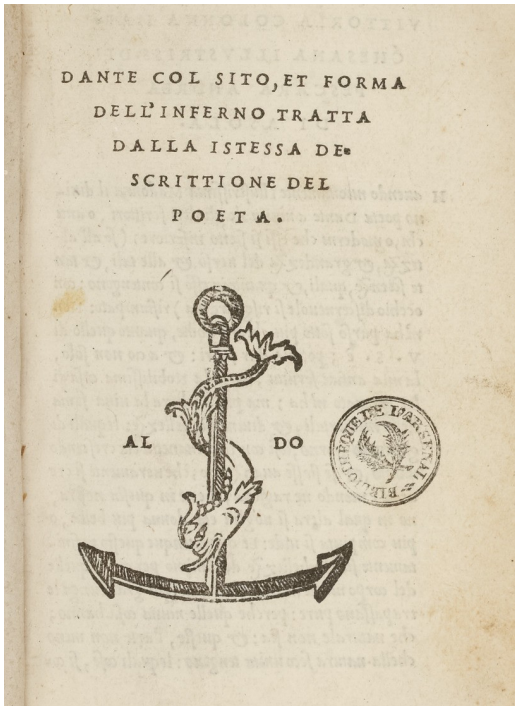
In 1490, the humanist publisher **Aldus Manutius** founded his own print shop in Venice. He specialized in the production of pocket editions (known as **in octavo** editions, folded 3 times in order to have 8 leafs or 16 pages), especially of classical and humanist contemporary authors. These small books, the predecessors of modern paperbacks, made him famous all over Europe, recognizable by his printer's mark: a dolphin twisted around an anchor **(Fig. 22)**.

Manutius started to print contemporary classics by Dante, Pietro Bembo and Erasmus of Rotterdam, and, around the year 1500, he sought to further enhance the reader's experience by introducing **italic print** (cursive print), foliation on both sides of the leaves (pagination), modern punctuation, as well as a catalogue of all the books that he had edited. The invention of the italic type, notably, allowed him to fit more text into a reduced book format **(Fig. 23)**.

In the 1470's, France became the second country (after Italy) to adopt Gutenberg's new printing system. The first print shop was established with the help of two theologians, **Guillaume Fichet** and **Jean Heynlin** in Paris in the year 1470. These two men gathered three typographers: **Ulrich Gering**, **Michael Friburger** and **Martin Crantz** and set up shop near the Sorbonne University to be able to satisfy the increasing demand for cheap academic books with as few copy errors as possible. Within the first three years this shop produced 22 humanist pedagogical books.

In the Burgundian Low Countries, the Dutch translator and scribe, **Colard Mansion**, became one of the first printers in the city of Bruges. Having been a successful luxury manuscript copyist, he began to delve in the world of the printed book, editing classics on politics, morals, and poetry, as well as technical treatises and texts on current affairs. His books were mostly printed in French and his catalogue not only reflected the tastes and interests of the aristocratic Burgundian cultural and intellectual sphere, but also of a more diversified urban bourgeoisie.

The printer responsible for introducing the printing press to the British Isles, in 1476, was **William Caxton**. Having been a merchant in Bruges, he established the first print shop in Westminster Abbey, London, publishing a series of books in English as well as translations in French. Like many other printers of the late Middle Ages, Caxton was not only a merchant and a printer, but his own editor and translator.
In just about 50 years after the invention of the movable type system, more than 40,000 editions had been printed in Europe, totaling about 10 million copies.



THE DIFFUSION AND IMPACT OF THE PRINTED BOOK

The monastic *scriptorium* had combined production with consumption. That is to say, each religious institution produced its own book collection according to its specific needs and resources. In this context, the decision of what books to copy depended wholly on the initiative of the institutions' authority figure. There was no book trade as such; only a few manuscripts circulated, from center to center, and were copied if necessary.

In the latter part of the Middle Ages, and with a well-established urban manuscript book trade in cities such as Paris, Bologne, Bruges and London, demand was high, especially among the clergy and the student population. Traditional book manufacturers were facing great difficulties to meet the high demand, and the quality of the resulting texts suffered greatly. Books that couldn't be bought could be consulted in private collections or semi-public libraries where they were often chained to desks so as to avoid light-

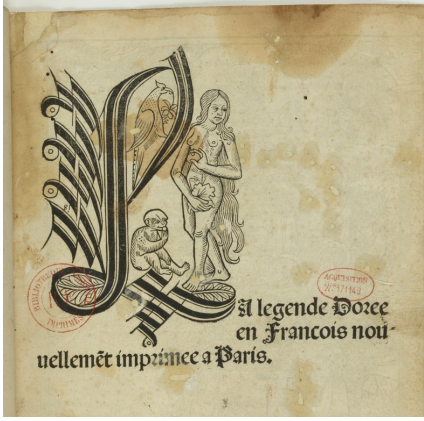
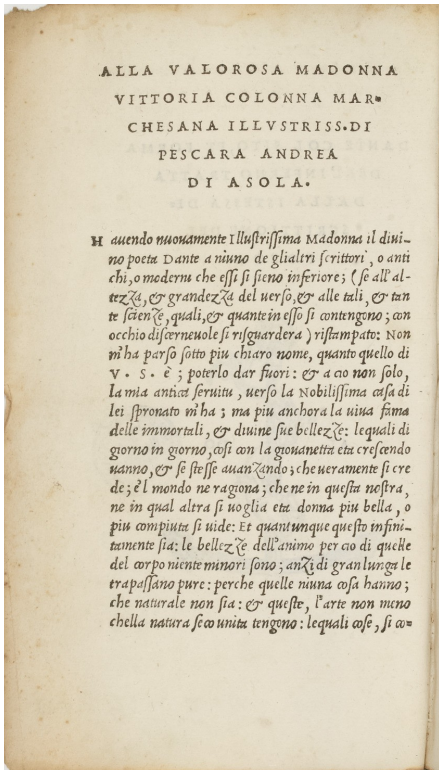


Fig. 20 (above) : Printer's title page informing the reader about the title of the book, the language it is translated into (French) and the fact that it has been "newly printed in Paris".

Bibliothèque nationale de France. Département Réserve des livres rares, RES-H-1120 , paper, 1499
Editor: Nicolas de La Barre for Simon Vostre

For a closer look:
https://gallica.bnf.fr/ark:/12148/btv1b8604282b/f17.item


ALLA VALOROSA MADONNA
VITTORIA COLONNA MAR-
CHESANA ILLVSTRISS. DI
PESCARA ANDREA
DI ASOLA.

H auendo nuouamente Illustrissima Madonna il divino poeta Dante a niuno de gli altri scrittori, o antichi, o moderni che essi si sieno inferiore; (se all'altezza, & grandezza del uerso, & alle tali, & tante scienze, quali, & quante in esso si contengono; con occhio diserneuole si risguardera) ristampato: Non m'ha parso sotto piu chiaro nome, quanto quello di V. S. è; poterlo dar fuori: & a cio non solo, La mia antica seruitu, uerso la Nobilissima casa di lei sprouato m'ha; ma piu anchora la uiua fama delle immortali, & diuine sue bellezze: lequali di giorno in giorno, cosi con la giouanetta eta crescendo uanno, & se stesse auanzando; che ueramente si crede; è l mondo ne ragiona; che ne in questa nostra, ne in qual altra si uoglia eta donna piu bella, o piu compiuta si uide: Et quantunque questo infinitamente sia: le bellezze dell'animo per cio di quelle del corpo niente minori sono; anzi di gran lunga le trapassano pure: perche quelle niuna cosa hanno; che naturale non sia: & queste, l'arte non meno chella natura seco unita tengono: lequali cose, si a-

Fig. 23 (above): Dedication page written in Manutius's italic print.

Bibliothèque nationale de France, département Arsenal, RESERVE 8-BL-6810
***The Divine Comedy,* Dante Alighieri, Aldus Manutius (editor), 1515**

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k1511348t/f8.item

Fig. 22 (left): Title page with Aldus Manutius's motif, specifying that the edition includes an engraving of Dante's Inferno, created according to the author's own description.

Bibliothèque nationale de France, département Arsenal, RESERVE 8-BL-6810
***The Divine Comedy,* Dante Alighieri, Aldus Manutius (editor), 1515**

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k1511348t/f7.item

fingered students taking them home. And intellectuals would often have to travel far and wide in order to gain access to certain study manuals and theological texts.

With Gutenberg's new printing system books of all genres were available in abundance and at a lower price (about an eighth of the cost of a manuscript book). Travel journals and guides, poetry compilations, books on art history and architecture, courtly romance, medicinal recipes etc. were accessible to a larger part of the population, one that was becoming ever more literate. Moreover, all copies from one same edition would contain an identical text (apart from some corrections while printing) so the same information was available to a larger number of the reading population.

As literacy rates were rapidly increasing, translations in vernacular and texts that could appeal to a greater secular public became a priority. So, practical and technical treatises were published, poetry and historical as well as romantic novels **(Fig. 24 and 25)**. Vernacular eventually became the standard, supplanting Latin in favor of each territory's linguistic identity, further stimulating alphabetization.

The texts that would make it to print were not only the well-known texts created in Classical Antiquity or the Early Middle Ages (which were now more precise and standardized than they had ever been), but more and more also treatises by contemporary authors and researchers, who could have their imagination and ideas printed and distributed among their peers. This led to mutual commentaries and reviews, which often resulted in debates and discussions on religion, history, sciences, art and politics. With the printed press, ideas could propagate rapidly throughout Europe, making certain authors well-known and successful during their lifetimes. Some authors became so successful that they were able to make a living off their writing.

Political or religious reformers such as **Martin Luther** (1483-1546) could reach a large number of people in distant lands without having to be present, and their movements were able to organize and expand in ways that would have been impossible before the printed book, because information was taking on ever smaller formats and could be mass-produced and diffused at great speed.

Most printed books were, in fact, much smaller than manuscripts, which meant that the way in which they were consulted and stored also changed. Large desks were no longer needed for reading because one could read anywhere, and books no longer had to be stacked horizontally inside trunks but could be arranged vertically on shelves. As private libraries continued to expand, public libraries were also created, giving direct access to information to a larger number of people.

The invention of the printing press was a driving force in the spread of knowledge and information. It began to revolutionize the way people read and, therefore, the way they thought. However, individual access to information through the printed text started to threaten the authority of certain traditional institutions, because being able to independently print and diffuse revolutionary ideas was, in many ways, emancipating culture from political and religious control. However, while on the one hand publishing and distributing hundreds or thousands of copies of a book was made easier than ever, on the other hand, tracking where they had been produced (thanks to title pages and watermarks) was also a much simpler task for the vigilant authorities.

The fear of having the public doubt and question the ideas of the church and state, led to a tightening grip on censoring and regulating the edition and printing of certain texts. Texts had to be verified before their publication and printers had to have certain licenses in order to be able to print certain texts. In fact, in 1501, Pope Alexander VI threatened printers with excommunication if they printed manuscripts without the church's approval, and by 1538, in Italy, the first list that prohibited the diffusion and possession of certain books had been created.

The process, however, could not be stopped. Johann Gutenberg's printing press had not only been an effect but also an important cause of the growth of literacy in Europe in the latter part of the Middle Ages. It had provided access to information and education to an ever-growing number of people, and it had set in motion the wheels of European modernization.

Fig. 24, 25 (left to right): These two editions of the Romance of Jason and Medea by Raoul Le Fèvre were printed a couple years apart by the Dutch editor, Jacob Bellaert. On the left, the book is printed in middle Dutch, with colorless illustrations engraved in wood, and hand-rubricated initials. On the right, what would seem to be a more expensive edition (although left unfinished), is printed in middle French, with hand-colored illustrations and metallic highlights.

Bibliothèque nationale de France, département Réserve des livres rares, RES-Y2-349, p. 110
Historie van den vromen ridder Jason, Raoul Le Fèvre (author), Haarlem, Jacob Bellaert (editor), 1483-1485

Bibliothèque nationale de France, département Réserve des livres rares, RES-Y2-153
Le roman de Jason et Médéé, Raoul Le Fèvre (author), Jacob Bellaert (editor), Haarlem, 1485-1486

For a closer look:
https://gallica.bnf.fr/ark:/12148/bpt6k1511348t/f7.item

GLOSSARY

Blackletter (Gothic script): Also known as Gothic minuscule or Textura, was a script used throughout Western Europe from ca. 1150 until the 17th century.

Block books: A book in which both text and image are block printed out of a sole block of wood.

Book of Hours: a popular Christian devotional book, containing a collection of texts, psalms, prayers, for private devotion in the Middle Ages.

Carolingian minuscule: A standard script developed in the Carolingian Empire to standardize texts and make them easier to read. It was used between ca. 800 and 1200, but was re-exhumed by Italian humanists during the Renaissance.

Compositor (typographer): The person in charge of arranging a given text onto a type frame using individual metal letterforms in order to compose and print a volume.

Conform copy: An exact and correct copy of a document or a text.

Devotio Moderna: A movement of spiritual renewal during the 14th and 15th centuries that promoted personal, individual and intimate religious practice, as opposed to more traditional medieval collective piety.

Diacritical signs: Signs that are placed above, below or next to certain letters in order to modify pronunciation or meaning. They serve to apply accent, tone or stress to a certain part of the word, as well as meaning between two identical words.

DK characters: The first large-moduled Gothic type created by Gutenberg and his associates.

Erratum: A page containing a list of the printing errors that can be found at the end of a text.

Foliation: Marking the number of leaves on a manuscript or a printed book.

French 'batarde': A blackletter script used in France, the Burgundian Netherlands and Germany during the 14th and 15th centuries. Early printers reproduced this script, notably for texts in vernacular.

Humanist minuscule: A style of script based on the Carolingian minuscule which appeared in Italy at the beginning of the 15th century, and which, for its clarity and elegance, humanists considered to have originated in Ancient Rome.

In folio: A type of printed book in which the leaves and quires are formed by folding the sheets of paper half through the middle. This type of fold turns one sheet of paper into a double leaf, consisting of 2 leaves (4 pages).

In octavo: A small printed book in which each sheet of paper has been folded 3 times, producing 8 smaller leaves printed on either side, that is to say, 16 printed pages in total.

Incunables or **incunabula:** Latin term meaning 'cradle' used to identify printed books produced up until 1500.

Italic print: A printed slanted cursive type developed in the 15th and 16th centuries by Aldus Manutius.

Ligatures: A printed or written character composed of two or more letters joined together. They serve to fit more text onto a smaller amount of space.

Littera antiqua: A type invented in Italy around the 1470 by Nicolas Jensen. This type imitated the humanist script, which, in turn, imitated the Carolingian minuscule.

Parchment: Animal skin, especially prepared to be used as a writing support.

Printer: The person in charge of operating the printing press by applying pressure onto a printing form, onto which a sheet of paper has been placed.

Quire (gathering): A collection of folded sheets of paper or parchment, creating double leaves that are placed one within another.

Relief printing: Relief printing is a printmaking process where the protruding surfaces of the printing plate or block are inked; the recessed areas remain ink free.

Rubrication: From the Latin "rubrus" (red). The use of script of a different color on a page, derived from the practice of highlighting liturgical directions and headings in red.

Scriptorium (Pl. scriptoria): From the Latin verb "scribere" (to write). Within a medieval monastery, a workshop where books were written, copied and decorated.

Title page: The page in a book containing the title, the names of the author and publisher, the date and the place of publication. They appear and become more frequent towards the end of the 1400's.

Vellum: Veal skin used for the most luxurious books.

Visorium: An instrument that helped support the exemplar of a text in order to facilitate the composing of the type pieces by the compositor.

Watermark: An image in paper sheets created by mark of in the papermaker's mould and visible when the paper is held up to the light.

Xylography: The process of engraving text and/or images into the surface of wood, notably for printing.

Bibliothèque nationale de France, département Estampes et photographie, RESERVE FOL-QE-55, f. 12r
Cronica cronicarum ab Initio Mundi, The Nuremberg Chronicles. Hartmann Schedel (author). Nuremberg. 1493