



typography pocket essentials



I L E X

Introduction

The evolution from the written word into the printed word has resulted in the discipline that we call typography. The term covers both the design of typefaces and their use in visual communication. Typography has seen many technical advances, the most recent of which being the digital revolution. It is therefore a paradox that in an industry that depends upon the very latest technology, many of the typefaces that we use today were created hundreds of years ago.

Typography could not exist without the invention of the "printing press." But it is movable types and the process of their manufacture that is responsible for the advancement of printing. These cast metal letters that could be used again and again were the basis of Johannes Gutenberg's eventual breakthrough—the "soldiers of lead that have conquered the world," as they have been called.

Typographers and printers have always been occupied by the merits of this or that typeface, but now the writer of a "thank you" letter, who once took up a fountain pen, can sit at a keyboard and scroll through a collection of fonts, choosing one at random with no knowledge of its origins.

Among the thousands of digital fonts now available are the classic typefaces from over 500 years of printing. These were innovations in their time, setting standards, and each has a story to tell.

The heart of the story lies with the punchcutter, who with simple, unremarkable tools but with the skill of his hands and the conviction of his eye, by the tightening of a curve or the thinning of a serif, was able to transform a commonplace letterform into a character of unique personality.

At first, typefaces were cast from a mold that was fitted with a matrix, so that when the molten metal was poured into the mold, the reversed, indented letterform of the matrix dictated the type's shape. A matrix is a die of a single type, and a punch is required to make it.

The punchcutter starts with a small bar of steel, out of which he will cut a punch for each character of a font—capitals, lower case, figures, and punctuation. If a character includes an enclosed space, like "O," "B," or "a," in one technique of punchcutting, a counterpunch may be required. This is cut to the shape of the enclosed space and driven into the letter punch. Then, passing the punch over a lighted candle to coat it with soot, he presses it onto paper, to ensure uniformity with the style of the other characters. When complete, the set of punches is hardened. Any number of matrices could be made by the process of a "strike," when a punch was driven into a small bar of copper. These were then trimmed, ready to fit into the mold.

Gutenberg's most significant invention was an adjustable mold, which would fit to the character widths of different type sizes. With the matrix fitted, a small amount of molten metal was poured into the mold, and within seconds a piece of type could be removed. Although modified and refined this process lasted for over 400 years, until the late 19th century when Linn Boyd Benton invented the punchcutting machine.

During the 20th century the skills of type design moved from the punchcutter-designer to the draftsman-designer, using digital outlines, described in the form of Bézier curves. Using this method, many new and innovative typefaces have been created, ushering in the start of a new era in type design and typography.

Much of the terminology we use today comes from the days of letterpress printing—like "body," the piece of metal out of which the character was created, or "leading," which derives from the strips of lead used to add interlinear spacing—and digital technology has added to this lexicon with terms like "font metrics" and "style sheet."

In the following chapters we look at the history of type design and the great names associated with it, as well as the anatomy of individual characters. We explore what makes type look good on the page or screen; and finally there is a font identifier that will help you select the right typeface for your next project.

THE ALPHABET we use today in America and Western Europe is derived from the Roman inscriptional letterforms of the first century AD. One of the finest examples of these letterforms is cut into the plinth at the base of Trajan's Column in the Forum in Rome, erected around AD 114 as a monument to the exploits of emperor Marcus Traianus.

The evolution of letterforms

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The Romans adapted their alphabet from the Greek system of writing, and the Greeks had modified the Phoenician system by adding letters to represent the vowels. The Trajan's Column inscription contains most of the letters of the alphabet we use, but the early Roman alphabet did not contain the letters "J," "U," or "W." The letter J was not introduced until the 17th century, because it was not previously differentiated from the letter "I."

These chisel-cut letters are known as *quadrata* or, more commonly, square capitals. The techni-

cal term for these letterforms is *majuscules*. These capitals were used to express authority, as they do today, and their form contains the structural proportions that still inform the basic proportions of our current lettering and typefaces. Look at the full forms of "O" and "D," and the narrower forms of "E" and "S." Such forms represent classical proportions, geometric relationships of form established by ancient Greek and Roman cultures, which have become ingrained in our letterforms and have been returned to time and again for inspiration through

Square capitals are the origin of our present-day alphabet. Note how the serifs, which are not

crucial to the identity of the letterform, seem to derive from the nature of the broad pen or brush.



history. They are examples of the origins of the European cultural aesthetic.

These letters would have been carefully drawn out and then cut into the stone, and therefore represent permanence and formality. This is in contrast to the handwritten form, which can be formal but also informal, created in a more immediate way on wax or papyrus, which is, of course, less permanent.

An important feature of Roman letterforms is the serifs, the small cross-lines that complete the end of a stroke. Their existence has been the subject of academic study, as their presence does not have a bearing on the letters' meaning since the letters function perfectly well without them. The Roman Catholic priest, teacher, and calligrapher, Father Edward Catich's explanation has general acceptance, which is that serifs are formed as a result of the scribe drawing out the letters with a brush as the panel was planned, before the mason finally cut them into the stone. This would explain the bracket-like shapes formed in the example below.

While square capitals were for monumental inscriptions, there was also an informal handwritten version of the capitals for ordinary occasions. This form is known as *rustic*. These more condensed forms appeared during the second to fourth centuries AD. Although there are examples of carved rustics, it was a form used largely for the recording of more ephemeral information—everyday documents such as contracts, bills of sale, legal, and domestic letters. Literary manuscripts were also written in rustics, for example Virgil's *Aeneid*.

UNCIAL EVOLVES

During the fourth century, rustic capitals were modified to a more rounded form, adapted to the convenience of writing with a pen. A form known as the *uncial* (from the Latin for "inch") gained success over the rustic because it was easier to read. The handwritten form using a broad pen created a broad, vertical stroke that contrasted with the thin, horizontal stroke as the pen was moved across, up and down, and up and round.

Right: Trajan's Column is a second-century Memorial to the Roman Emperor Traianus. Pen-written square capitals were used for a variety of documents, both formal and informal.



The evolution of letterforms

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Left: A French manuscript illustration from 1340 shows a scribe seated at his writing desk with his tools. The exemplar from which he is making a copy is open on the stand before him.

Above: The Luttrell Psalter from 1320 demonstrates the strong, vertical strokes of a broad pen and was completed separately to the illumination, despite the integrated appearance.

Further changes came about over time as the hand and pen dictated the form more distinctly. A preference for curves brought about the more economic half-uncial, creating the minuscule form. From this development, one can see the first signs of what is, in typographic terms, the lowercase letterform.

THE HALF-UNCIAL

The half-uncial flourished throughout Europe because of its use in mostly religious works. It developed regional or national styles, each with distinct characteristics that made it possible to identify its place of origin: the Merovingian style referred to France, the Beneventan to Italy, the

Visigothic to Spain, and the Insular to Ireland and England. One of the greatest achievements of the art of the scribes and illuminators of the period is the Book of Kells, a beautiful product of an Irish monastery, which contains a Latin version of the Gospels and dates from approximately 800 AD.

CHARLEMAGNE

The Holy Roman Emperor Charlemagne (742–814) had united most of Western Europe by 804. He intended to consolidate the Christian faith by reforms that included the establishment of a system of education, and the patronage of the arts and literature. He was concerned at the diversity of written hands throughout his Empire, and as



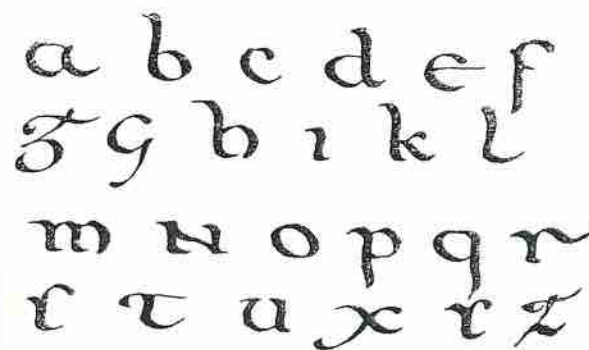
Above: Many years of use and the increasing importance of writing caused modification of the square capitals, so that by the fourth century a more

cursive form evolved. This later became known as the uncial. Note the circular form of the "e," heralding the development of the lowercase letterform.

part of his reforms he commissioned Alcuin of York to set up a new scriptorium at the Royal court in Aachen, now in Germany, where he was to create a script to become a new standard for manuscript writing throughout the Empire. It was based on the Insular half-uncial and the Merovingian hand. The new script has become known as the Carolingian script. It was a ninth-century attempt to improve communication by the introduction of standardization.

THE MONASTERIAL AGE

From the fall of Rome in the fifth century through to the 12th century, monasteries and other establishments related to the church had a monopoly on book production, and were therefore able to control the content and circulation of manuscripts. For many centuries, manuscripts were the only written medium for recording and conveying ideas. The place where the manuscripts were copied was called a scriptorium and most scriptoria were attached to a church or a monastery. The work of the scribe was to copy religious manuscripts, Bibles, and books of prayer. Most original exemplar manuscripts were owned by



Left: During the sixth century, the half-uncial was established as a forerunner of the present lower case. Note the triangular form of the "a" has modified into a continuous circular form. The tail of the "g" has also lengthened considerably.

The evolution of letterforms

the libraries of the church, or by nobles, and were loaned out to the scriptoria for copying. People employed as stationers were responsible for recording the loans of the exemplar manuscripts and checking that they had been copied correctly.

SECULAR SCRIPTORIA

From the end of the 12th century, the church monopoly was challenged as universities established their own scriptoria. Although the monasteries continued to produce manuscripts for their own devotional needs, the establishment of the new universities, and the development of learning among the laity, created a new kind of reader.

After the monasterial age, the secular age brought only small technical changes. The major innovation was the introduction of paper. Traditionally, books and other manuscripts were written on parchment, which was expensive and depended on an adequate supply of animal skins. The universities' growing demand for books made the expanding manufacture of paper an alternative to be encouraged, especially as the students required a less elaborate product.

REGIONAL SCRIPTS

During the centuries following the introduction of the Carolingian script, the influence of Charlemagne's revisions began to fade and regional writing styles slowly began to reappear. In northern Europe there gradually emerged the group of heavy, solid, manuscript hands called Gothic



Above: A Chinese drawing depicting two papermakers preparing paper. The wet

sheets of pulp were smoothed onto screens to dry out.

or blackletter. Textura was one of this group, and by the early 15th century, with minor variants, it was a standard script in German-speaking regions for formal book work. It was on the Textura letterform that Johannes Gutenberg based his first type designs. "Gothic" was the

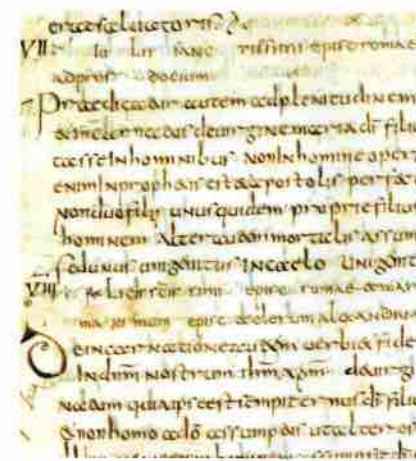
disparaging term used by the Renaissance humanists of Italy, who had, through the church bureaucracy, reintroduced a form of Carolingian script that was considered to best reflect the values of humanist philosophy.

THE BIRTH OF PRINTING

The production of books written and illustrated by hand was a highly organized but slow and labor-intensive process. By the 15th century, the demand for books was increasing. Printing from a raised surface had been known for many years, but only from woodcut blocks, not individual letters. At markets and fairs it was possible to buy block books—booklets printed from woodcuts, with pictures of religious events illustrating a short, handcut text. Making prints from a raised and inked surface (letterpress printing) is the oldest method of printing, and it maintained supremacy over other methods of printing well into the 20th century.

Many technological advances depend on the coming together of a number of new developments. In the case of printing, it was paper that played the key role. Compared to parchment, paper offered a suitably manageable and more economical material for printing.

Papermaking was a craft that originated in China, and is believed to have been the discovery of Cai Lun in AD 104. The first papermill in Europe was established in Catalonia (now in Spain) in 1238, followed by mills in Fabriano in Italy in 1276, and in Nuremberg in Germany in 1389. Papermaking required specific conditions to operate effectively. The mills needed to be near water for power and for processing; and they also needed to be near a sustainable supply of rags, which were then the basic ingredient of paper, so the mills had to be close to large population centers.



Above: An eighth-century text from Alcuin of York's Acts of Council of Ephesus. Note the use of initial letters in this uncial-formed alphabet.

Below: An illuminated initial letter from the 14th century. Within the letter, a monk is shown writing a manuscript.



THE RENAISSANCE

THE MIDDLE AGES had seen the collapse of the Roman Empire and the consolidation of Christianity throughout Europe. By the 15th century, feudalism, previously the dominant social and economic structure, was beginning to give way to a monetary economy.

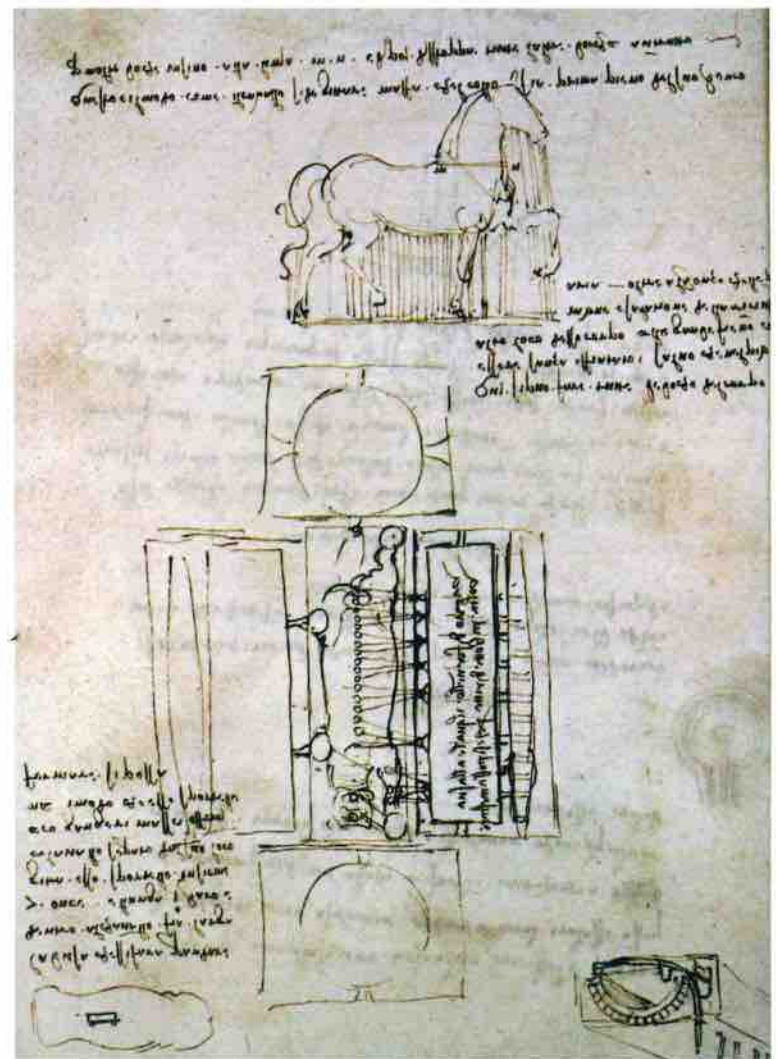
The main thrust of the Renaissance was the rediscovery and admiration of the ancient pre-Christian cultures of Greece and Rome, and a new belief in the value of those artifacts and manuscripts that had survived into the 14th and 15th centuries. The ancient civilizations offered knowledge of every aspect of human endeavor: art, literature, architecture, engineering, philosophy, medicine, science, and government. The integration of Greek and Roman knowledge and wisdom with Christian morality brought about the concept of humanism.

The humanist ideals were individualism, originality, and a general proficiency that was the basis of Renaissance education. This was expressed in the importance attached to the visual arts; these were patronized by the church, rich merchants, and dignitaries, so that they developed from workshop-based artisan activity to the heights of creative skill and imagination.

At the same time, the developing international trade created an increasing number of successful merchants, whose power and economic importance brought about the institution of banking. Although forbidden by the church, the desire by the wealthy and powerful to make use of credit and to possess and consume goods, was supported by an increasing reliance on loans with interest or concessions.

It was in the climate created by the two driving forces of commerce and passion for knowledge that the invention of printing from movable type was to grow so quickly. Even though printing could provide classical and religious texts for an increasing audience at a more acceptable cost compared with handwritten manuscripts, printers and publishers needed considerable financial support as printing a book was an expensive undertaking.

Opposite: In his notebooks Leonardo da Vinci represents the Renaissance man as being someone with a vigorous interest in all things. Beginning in 1508, he kept notebooks, writing notes and treatises in them, and making drawings on many subjects, from the mechanics of war to anatomy. As he was left-handed, he wrote using "mirror writing" from right to left.



THERE IS CONTROVERSY surrounding the origin of the invention of printing from movable types in Europe. However, it is generally accepted that between 1440 and 1450 Johannes Gutenberg produced the first-known book to be printed in this way.

Johannes Gutenberg

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Little is known about Gutenberg. He was born in the German town of Mainz, capital of the Rhine-land Palatinate, in about 1394; he lived for some time in Strasbourg, and died in Mainz in 1468. What we do know about him is derived largely from the court records in Mainz, at the time a city of 6,000 inhabitants.

It is likely that Gutenberg employed a number of people to help him with the development of his printing invention. This possibly led to the financial problems that he experienced during the years of his research and development. The court records refer to a legal dispute over a loan of 800

guilders. The loan for "work on the books," was made by Johannes Fust, a lawyer. A further loan of 800 guilders was made, which also named Fust as a partner. It appears that in 1455, Fust decided to take over Gutenberg's invention rather than accept the return of his investment, which would suggest that Gutenberg was enjoying success with his innovation. Fust continued printing in partnership with Peter Schoeffer, originally Gutenberg's foreman. Schoeffer had a good knowledge of the printing process, and later married Fust's daughter. After the loss of his types and presses, little more is known of Gutenberg,



The 42-line Bible, Gutenberg's masterpiece, was completed c.1450. The design consisted of two 42-line columns per page. Also known as the Mazarin Bible, and printed as two volumes, it contains some 1,200 pages. About 180 copies were produced, of which 48 are known to have survived to the present day.

Vorrede in das Bairisch lantrechtbüch.



Wir Ludwig von gottes genaden Mar/ graue zu Brandenburg. Wir Stephan. Wir Ludwig. Wir Wilhelme von gottes genade Pfaltzgraf bey rhen vñ Berz/ og in bayren ic. Habē angelehen belige/ preffe den wir gehabt haben in vnserem lande zu bayren an dem rechten. Vñ dāvon sey wir zu ar worden mit vnserm herre vñ väterleu kaiser Ludwige vñ rom. Vñ lizen vñ besätzigē alles das hernach geschriben steeet nach seinē gebor vñ hauffen vnserem land zu bairn zu fiderig vñ zu funderē genaden. Das ist geliche do man sal vñ crift gepurt dreizehen hundert vñ in dem sechshund vierzigsten jar des nächsten samst/ tage nach dem obersten ic.

Wie man dz recht behaltē sol.

Da von gepreut war bey vnseren herten allen vn/ leren Rāthern vñ Amptleuten in vnserem lande zu bayren abtrotz pflerten vñ merckten vñ vñ auff dem land das se die selben recht also behalten bey iren arden die se von os vnseren vñ crift darumb schweren müssen vñ dāvon se darnach von wort si wort von stuck zu stucke armen vñ rechen vñ gengerich richten sollen. Vñ dāvil das rechtlich also ganz vñ alt geprefferet vñ auch mer anmel getanter auff allen genychen stert vñ merckten nach des kaisers hauffen.

except that after 1460 he is believed to have given up printing. However, this may not have been the case, since it is recorded that he received a pension from the Archbishop of Mainz until his death.

Gutenberg's achievement was to invent a system of mass production, enabling books to be produced in greater numbers and more economically. His invention played a fundamental role in the development of the modern world, and was the single most important factor in the spread of knowledge and the move toward universal literacy in the West.

At this time all skills, trades, and professions were guarded jealously by their practitioners, so it is not surprising that there was so much secrecy surrounding Gutenberg's experiments. For centuries a training in printing, as in many

other trades, had to be bought through apprenticeship if you were not lucky enough to be born into the family of a printer.

THE ADJUSTABLE MOLD

The brilliance of Gutenberg's invention was in adapting several existing technologies to make them suitable for his own requirements, and, possibly, in using earlier ideas by others such as Coster. Gutenberg's innovations included the modification of the screw press, originally used to crush fruit, and the adaptation of the techniques of punchcutting, brass mold-making, and metal-casting, which were already familiar to silversmiths and engravers. Gutenberg's key innovation was the adjustable mold. This was a

Left: Rotunda. This printed page uses one of the main forms of blackletter, or Gothic Letter, also known as round text.

Below: One of the four main groups that cover vernacular blackletter texts, an example of Bastarda is shown here.

Dem Erberen vñnd wolgeachten / fetlicher maiestat rath etc. mein vñnd greffer sprichliche / Abtische Dure

Wemol ich Kunstiger Herr vñnd fre fürnemē zu straffen vñnderstehn/ de standes vñnd mit wenig Kunst begab geter at hab / oder von nemand ande weit ihr mir zu mer em mal angehalten/ auch vñcher an tag aeb/ hab ich mich vil ehe in die gebir vertragen/ Wemol ich hoff/ mir werd nym ist/ zu argem auflegen, das ich das so ich mit hie mit kleiner versemmung zeytlicher hab/ so mill en das liech kommen laß/ sonder meniglich w loben/ vñnd den im allerbesten ver stehen. Diem allen Kunstliebhabenden, vñnd denen so zu lereu ich dem neyß/ so nichtē vñngestraft lest, seinen a gar vil lechter sey en Ding zu tadeln/ dann selb cher der alten/ so von den Kunstlen des malens. möcht mir die mein vorkaben als der meint ich den. Diemel aber solche bucher durch lang der mit keiner billigkeit verwisen werden/ od ich Arnung vñnd erfundung schzufflich aus lasse gehen ehen zu thun vñnd sach gegriuen werd/ vñnd vnser n von mosen/ damit die Kunst der maleren mit d

Johannes Gutenberg

mechanism of two fitting parts that could be adjusted to fit the matrix of each letter width to be cast, overcoming the problem of the necessity of a mold for each letter. Gutenberg also manufactured a thick, oil-based ink that could achieve a quality of black similar to that of the scribes' inks. His experiments resulted in the inclusion of antimony as part of the metal alloy (mostly lead with some tin) that produced a sharp letter cast from the mold without shrinkage as the metal cooled.

Gutenberg's greatest achievement was the 42-line Bible, completed in about 1455, which imitated the style of the handwritten book to a remarkable degree. His typeface was based on Textura, the formal script of northern Germany. Research suggests that to imitate the inconsistencies and abbreviations that appear in a handwritten manuscript, Gutenberg cast at least 300 characters in order to provide slight variations of letterform throughout the text.

EARLY PUBLICATIONS

There are four main groups of blackletter: Texturas; Gotico-antiquas (or Fere-humanisticas); Rotunda (round text); and Bastards (vernacular types).

In 1462, as the result of a political power struggle, Mainz was subjected to considerable violence and destruction. The resulting desolation and evictions helped to hasten the spread of printing across Europe, as printers became itinerant and were forced to look for new markets.

Right: Printing was brought to the British Isles by William Caxton in 1477. He set up his printing press in the Abbey Precinct at Westminster. His first book in English was printed in Bruges, Belgium, in 1475.



Many ambitious printers would have looked to Italy, the center of the new cultural force that was spreading across Europe—and in particular Venice, hub of international trade, and Rome, the home of the Pope and the center of Western Christianity. For Venice, the invention of printing became yet another opportunity for trade and greater wealth. For the church, mass-produced books that spread ideas not in line with Rome's policies eventually became a grave challenge to its authority.

FROM GOTHIC TO ROMAN

The early years of printing, from Gutenberg's 42-line Bible up to the 1500s, are referred to as the Incunabula Period. In Britain, printing was first introduced by William Caxton (1421–1491). Caxton occupied the post of Governor of English Wool Merchants in Bruges, Belgium. He studied the craft of printing in Germany and printed his first books in English in Bruges in 1475.

In 1476, he returned to England to set up a printing press at the Abbey Precinct, Westminster, "by the sign of the Red Pale." His first book printed in England was *The Dictes and Sayings of the Philosophers* (1477). When he died he had published 73 books in English.

Below: Early printers, like all tradesmen of the time, jealously guarded their craft secrets and practices. This did not, however, stop them from being the subject of artists' engravings.

