

contents, etc. (The preliminaries were not included in the main signature series of new books because it was usual to print them last; reprints, however, sometimes began the main signature series at the beginning of the preliminaries.) The printer may identify himself, and record the place and date of printing, on the title-page by means of an imprint, or at the end of the book in a colophon.

Next the paper should be considered. It will be hand-made, rough-surfaced compared with modern book papers, and off-white in colour. If it is held up to the light it will show as watermarks a pattern of broad-spaced lines (chain lines) crossed by lines that are close together (wire lines), and some of the leaves may also contain a watermarked picture or legend. The edges of the leaves may have been trimmed smooth by the binder, or left rough (uncut); it may even be that they are still joined together at the folded edges (unopened).

Finally, the binding. Working from the inside outwards, there will probably be one or two leaves of blank paper at each end of the book, which are of a different colour or texture from the printed leaves; these are the endpapers, which were added by the binder. There may also be strips of printed waste, or even of vellum cut from manuscripts, used by the binder in securing the spine of the volume. Next come the boards, the stiff upper and lower covers that were made in early days of wood, then of pasteboard and finally of millboard, with a paper paste-down inside, and covered on the outside with leather or rough paper. Various skins were used for leather bindings—calf, goat, and sheep were the commonest—and the surface was often decorated with heated brass tools, either using gold leaf (gilt) or plain (blind). In bindings of the later hand-press period the title of the book was tooled on the spine, though an early book may also have the title written on the fore-edge in ink—a relic of the time when it was placed on the shelf the other way round.

Next we consider the making of the hand-printed book in detail; and begin with Gutenberg's central invention: printing type.

## Printing type

### MANUFACTURE<sup>1</sup>

Printing types, three-dimensional representations of letters of the alphabet reversed left to right, were cast in an alloy of lead, antimony, and tin called type-metal; it was hard enough to wear well yet had a low melting point, and it neither shrank nor expanded when it cooled. The over-all height of each piece of type, called its height to paper, varied in the sixteenth century from printer to printer and even from fount to fount, being at first in the range 24.0–27.5 mm.;<sup>2</sup> thereafter standardization gradually took place. National standard heights began to emerge during the eighteenth century

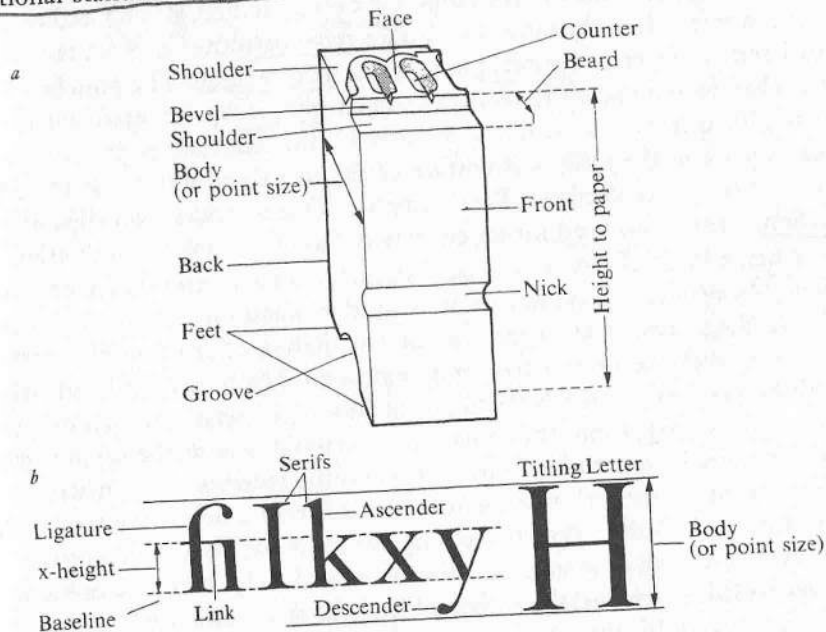


FIG. 1 (a). A piece of type and the names of its parts. The chief purpose of the nick, which could take various forms and could even (in France) be placed on the back of the letter, was to indicate the orientation of the face; it also helped to identify the fount to which a piece of type belonged (based on B.S. 2961: 1958).

1 (b). The names of the parts of impressions from type (based on B.S. 2961: 1958); the serifs in this example are bracketed. The first British Standard calls the ligature a 'logotype' and the link a 'ligature', but there are objections to the use of logotype (which has other meanings) in this sense.

<sup>1</sup> The best modern account is in Carter, H., *A view of early typography*, Oxford 1969, ch. 1.

<sup>2</sup> Audin, M., *Les types lyonnais primitifs*, Paris 1955.

but it was not until the end of the nineteenth century that any international type standards were established.

In order to accommodate alphabets of different sizes, types were made in different bodies; and, because letters of the same alphabet varied in width, types of the same body varied likewise. A group of type-cast alphabets and other symbols such as points and figures all of one body and design was called a fount, each variety (or sort) of type being supplied in approximate proportion to its frequency of use.

From the early days of printing, founts of type were cast in a wide variety of bodies and designs (or faces). Outsize faces, requiring bodies of up to 80 mm. were either cut individually in wood or metal, or were cast in sand from wooden or metal patterns, but most faces were intended to be cast in hand moulds on bodies in the range 3-15 mm.; and all, gothics and romans alike, were made in the same way. First a relief pattern of each letter was cut by hand on the end of a steel punch some 45 mm. long. The punches were then hammered into small blocks of copper (matrices); and each matrix was carefully trimmed so that the bottom of the impression of the punch was square to the sides and bottom of the block and was set at the right depth from its top surface. (This trimming of the matrices was called justification, a term also used for an entirely different process in typesetting.)

When a fount of type was to be cast, each matrix in turn was fixed in the mould, a steel box made in two parts, clad in wood for insulation and ease of handling. The type-caster put the two halves of the mould together, complete with the first matrix, and held them thus in his left hand, while with his right he lifted a ladle-full of molten type-metal. He then dropped the metal suddenly into the mouth of the mould, and at the same instant gave it a jerk or toss to force the metal into the recesses of the matrix (the precise form of the jerk varying with the different letters); the rest of the metal from the ladle filled the rectangular shaft between the two parts of the mould, and all of it solidified almost immediately. Next the caster laid down his ladle, removed the spring which held the matrix in place, touched the matrix with his thumb in order to loosen the type, opened the mould, and with one of the two iron picks attached to the upper part of it ejected the new letter on to the casting table. Visitors would laugh at the workman's jerking and whirling with the mould, but that was where the skill lay; a hand caster could turn out some 4,000 types a day (which is one every 10-12 seconds), but only the best men could avoid a high proportion of imperfections in that number.

When enough letters of a sort had been cast, the breaks—the jets of metal from the mouth of the mould—were snapped off by another workman, the flat surfaces of the shank were rubbed smooth, and the feet of the types

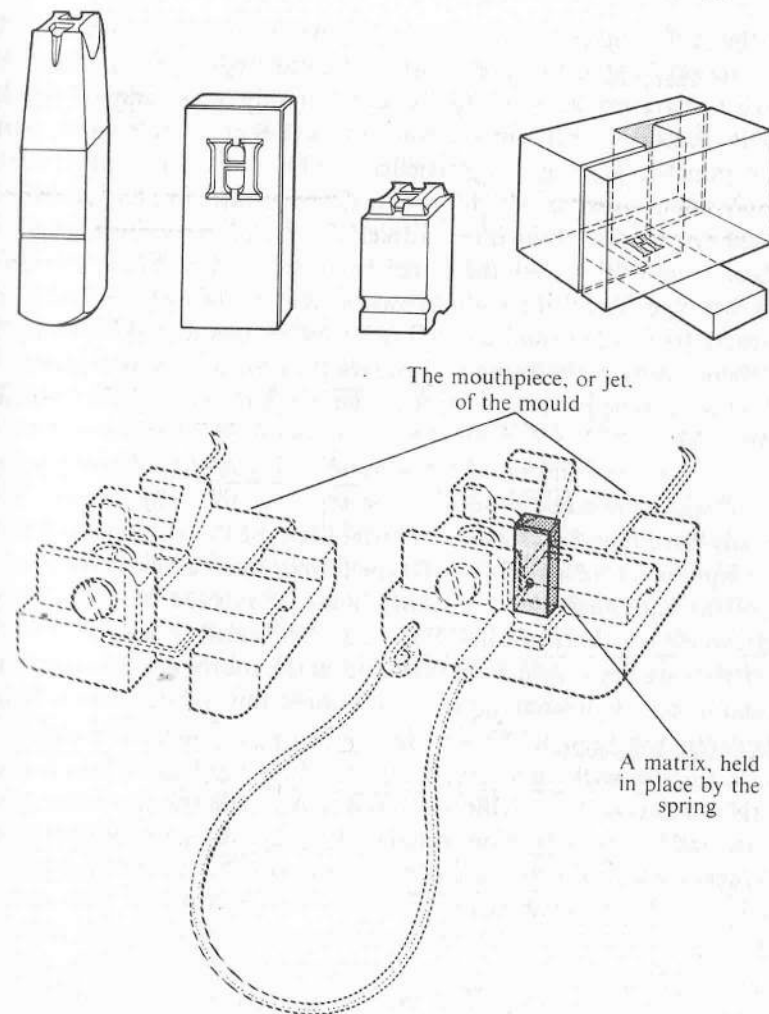


FIG. 2 (a). Punch, matrix, and type; and the principle of the hand mould shown schematically.

(b). The two halves of the hand mould.

were planed to remove traces of the jet; finally, the type faces were inspected for defects, and the sort was wrapped up in a packet for delivery. The caster meanwhile had substituted another matrix for the first and carried on, the mould being self-adjusting for the widths of the various letters of the fount.

There were never more than a handful of punch-cutters at work at a time during the hand-press period. Very few engravers commanded the necessary artistry, and in any case the trade did not require endless sets of closely similar punches, for each set of punches could make many sets of matrices.

In the earliest days of printing one or two printers may have cut their own punches, but even then most punch-cutters appear to have been specialist engravers such as die-sinkers or goldsmiths; and by the later fifteenth century punch-cutters were independent professionals, cutting sets of punches to order for particular printers or, increasingly, striking matrices from punches which remained their own property and selling justified matrices (or unjustified 'strikes') to the printers. From then until the later sixteenth century there was much trade in matrices, though not yet in cast type. The printer would own several sets of matrices and moulds of various sizes, and would employ specialist casters to make type for him with them, using his own metal. Printers thus financed and organized the production of type by independent craftsmen, but did not actually make it themselves.<sup>3</sup>

During the 1560s and 1570s type-founding began to evolve as a separate trade offering a finished product—cast type—to the printers, who would generally have found it more economical than the earlier system. The cost of the equipment for a fairly small type foundry was about three times the cost of the equipment for a printing house of average size; and printers were chronically short of capital. During this period three great specialist foundries were begun which set the trade on the course it was to follow until the end of the eighteenth century: they were the Guyot-Plantin foundry in Antwerp; the Egenolff-Sabon-Berner-Luther foundry in Frankfurt, hub of the European book trade; and the Le Bé foundry in Paris. These foundries bought up the best available materials and employed the finest punch-cutters; and by the early seventeenth century a growing majority of printers throughout Europe were buying type ready made, rather than having it cast from their own materials.<sup>4</sup>

#### TYPE SIZES; AND DESCRIPTION

There was from an early stage a tendency towards the standardization of type sizes. This may have arisen originally from the difficulty of altering the gauge of the mould, which could be used for casting different sets of matrices to the same body, but there was also an obvious convenience to the printer in being able to set different founts (of gothic and roman, for instance) alongside each other, and of using the same spacing material for several founts. At all events, when printers owned matrices they often had different founts cast on to the same body, very likely in the same mould, and at the same time punch-cutters produced faces that fitted comfortably on particular bodies. Later, when specialist type-foundries were casting

<sup>3</sup> Carter, H., op. cit., chs. 1, 5.

<sup>4</sup> Carter, H., op. cit., ch. 5.

founts for sale, it was to everybody's convenience that standard type sizes should be evolved and identified by name, and this is what happened during the early and middle sixteenth century.

Not that the standardization of type-sizes ever became complete or invariable during the hand-press period. Individual printing communities developed their own series of sizes, and the international trade in matrices and type led to a proliferation of standards. Thus in England three or four sizes of type were identified by name in the mid sixteenth century; by the later seventeenth century, English printers were naming ten or eleven different sizes; by the end of the eighteenth century the number had risen to about eighteen.<sup>5</sup> Body-sizes were no more than approximately constant: founders or printers might want to bring one body into line with another, or to cast a face on to a body other than the one for which it had been intended; and every one of ten supposedly standard bodies measured by Moxon in 1683 had changed slightly in size when they were remeasured by Smith for his *Printer's grammar* of 1755.<sup>6</sup> As to face sizes, the punch cutter could vary the proportions of his design, especially in the relationship of x-height to ascenders and descenders, so that a face cut by one man for a particular body might appear larger or smaller than a similar face cut by someone else for the same body, if indeed it did not actually differ in its over-all dimensions.

Nevertheless there were approximate standards in type-sizes, and they should be referred to in descriptions of early type. The full description of a type of the hand-press period will if possible include both its original designation (e.g. 'Pica roman. Caslon No. 2') and measurements made from its printed image of the apparent sizes of its body and face. \*

To take the measurements first, the apparent sizes of body and face will not be exactly the same as were the actual sizes of the original metal type. Type was thrust deep into roughish paper which had been softened by damping; the impression blurred at the edges as the type sank in, and then changed in size as the paper dried and shrank. (Paper shrinkage, which was more pronounced across the chain-lines than along them, generally reduced its dimensions by about 1 per cent, and occasionally by as much as 2½ per cent.)<sup>7</sup> The apparent body-size is taken by measuring twenty lines of the type vertically, several times over on different pages if possible, and the answer is given to the nearest millimetre.<sup>8</sup> The distance is measured

<sup>5</sup> Gray, G. K., and Palmer, W. M., *Abstracts from the wills . . . of printers . . . of Cambridge from 1504 to 1699*, London 1915, pp. 70-1; Moxon, J., *Mechanick exercises*, eds. Davis, H., and Carter, H., 2nd ed., Oxford 1962, pp. 19-21; Smith, J., *The printer's grammar*, London 1755, p. 19.

<sup>6</sup> Moxon, J., op. cit., p. 21; Smith, J., op. cit., p. 26.

<sup>7</sup> This is from my own observation; I do not know that any systematic investigation of paper-shrinkage has been made.

<sup>8</sup> It would be possible to use typographical points, which are small units of linear measure, rather

from a given point in a line to the corresponding point in the twenty-first line above or below; if less than twenty lines are available for measurement, a smaller number is used and the answer is converted to the twenty-line standard. It is important to make sure that the lines measured are set solid, that is to say without interlinear leads, the thin strips of typemetal, wood, or card that could be slipped in between each line of type.<sup>8a</sup> This can usually be established by finding a place where the descender from a letter such as g or p comes down immediately above an ascender rising from the line below; provided that the gap between them is 0.5 mm. or less (up to 1 mm. in the case of very large type) the lines are probably set solid, but if it is wider they are either leaded or printed from a fount cast on an oversize body. (It may be mentioned in this connection that titling capitals were generally cast full on the body, with no room for a matching set of small letters with descenders; see fig. 1 (b).)

The apparent body-size having been dealt with, the apparent size of the face is measured directly with a finely graduated scale and a magnifying glass. The vertical distance in millimetres is taken between the top of an ascender and the bottom of a neighbouring descender and is multiplied by 20: this gives the approximate 20-line measurement of the minimum body on which the face could be cast, not allowing for overhangs; it is often slightly less than the apparent body-size of a fount. Then the x-height and the capital height are measured in millimetres and the result is presented in the form: '[face height × 20] × [x-height]: [capital height]'. The measurements of the apparent size of a typical pica roman might then read: 'Body 82. Face 80 × 1.7: 2.5'.<sup>9</sup>

Once the apparent size of a fount is known it should be possible to discover its intended standard size by reference to the following table of the nine bodies most commonly used during the hand-press period. It gives the actual sizes as cast in Plantin's shop in Antwerp in the later sixteenth century, the sizes as measured by Moxon in 1683 and Smith in 1755, and the range of apparent sizes found in European and American printing of the seventeenth and eighteenth centuries, together with their names in English,<sup>10</sup> French, and Dutch.

The final stage in the description of an early type involves the identification than millimetres, for measuring the apparent sizes of early type; but it is better to keep points for the measurement of type in the metal.

<sup>8a</sup> If none of the type being measured appears to be set solid one has to be content with measuring the apparent size of the face alone.

<sup>9</sup> Adapted from a system introduced by H. D. L. Vervliet in his edition of *The type specimen of the Vatican Press 1628*, Amsterdam 1967.

<sup>10</sup> Pica rhymes with Leica, primer with trimmer, and brevier with rever; nonpareil is pronounced 'nónprul'. Bourgeois, a body size between brevier and long primer introduced in the eighteenth century, is pronounced to rhyme with rejoice.

TABLE 1: Names and Body-sizes of Text Types in the Hand-press Period

English name	Dutch name	French name	20-line measurements in mm.			Range of apparent sizes, 1600-1800
			Plantin, late 16th century	Moxon 1683	Smith 1755	
double pica	ascendonica	gros parangon	140	160	147	139-60
great primer	text	gros romain	117	122	119	116-22
english	Augustyn	St. Augustin	94	92	95	91-5
pica	mediaan	cicéro	79	81	85	79-85
small pica	descendiaan	philosophic	72	—	74	70-4
long primer	garamond	petit romain	66	66	68	65-9
brevier	brevier	petit texte	53	54.5	54	52-6
nonpareil	nonpareil	nonpareille	40	41	43	40-3
pearl	peert	perle	—	33	34	33-4

The term pica is still used occasionally for the Anglo-American 12-pt. body, and *cicéro* for the Didot 12-pt. body, although they are only approximately equal. There are similar parallels for the other bodies: great primer (etc.) for 18-pt.; english for 14-pt.; long primer for 10-pt.; brevier for 8-pt., and so on.

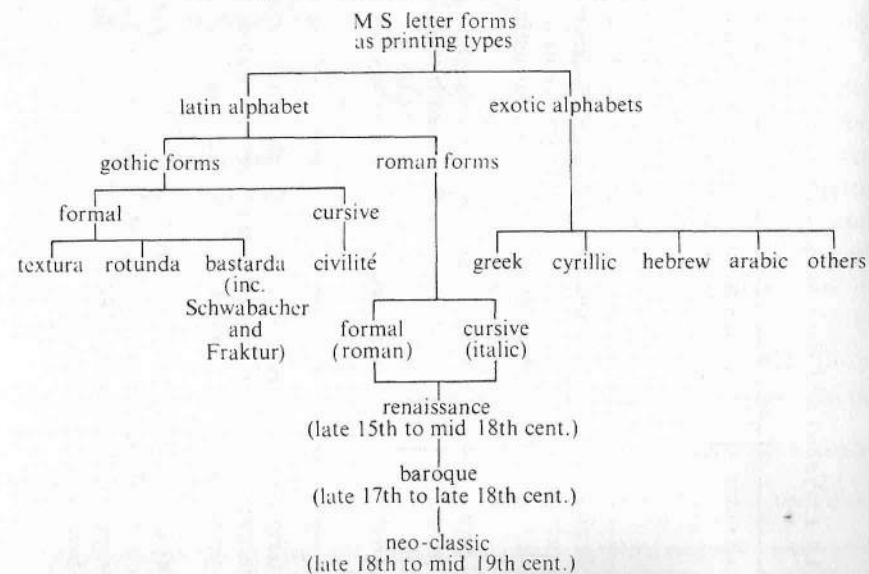
SOURCES: *Inventory of the Plantin-Moretus Museum punches and matrices*, Antwerp 1960; Voet, L., *The golden compasses*, ii; Moxon, J., *Mechanick exercises*, London 1683; Smith, J., *The printer's grammar*, London 1755; Hart, H., *Notes on a century of typography*, Oxford 1900; Gaskell, P., 'Type sizes in the eighteenth century', *Studies in bibliography*, v, 1952-3, pp. 147-51; type-founders' specimens.

tion of its face, a task that is often difficult and sometimes impossible. A brief guide to the general development of type design follows in the next section, but for the identification of particular faces it will be necessary to refer to early founders' and printers' type-specimens (see the reference bibliography, pp. 396-7). Even when the relevant specimens are available, difficulty may be caused by the facts that sets of punches might be revised, touched up, or added to during their long lives (a surprising amount of early-sixteenth-century type-founding material survives in working order today), and that the appearance of a face could be altered by differences in the width<sup>11</sup> of the bodies on which it was cast; two founts cast at different times from different sets of matrices may not be obviously of the same face even though both derive from the same basic set of punches. But only too often the right specimen cannot be found, and it is better to admit ignorance or uncertainty than to make a mis-identification.

#### TYPE FACES

If the body-sizes of early types were numerous, the faces cast on them were legion. It is not practicable to offer more than a general guide to them here, but even the broad classification of type faces has its problems, both because there is no generally agreed scheme for arranging the various letter forms found in type, and because the forms have to be classified in several ways

TABLE 2: *The Classification of Type Faces*



<sup>11</sup> The width, or thickness, of type is also known confusingly as its 'set'.

at once. Thus the table which follows is linguistic in dividing the Latin alphabet from the Greek and from the other exotic alphabets; morphological in distinguishing the Latin gothics from the Latin romans; and historical in its treatment of the successive forms of roman and italic.

This scheme, while much influenced by the draft and final versions of the official German standard for type classification (DIN 16 518, 1959 and 1964), does not follow either of them exactly. The chief differences are that the gothic Schwabacher and Fraktur forms are included here in the bastarda group; and that the roman traditions of Jenson and Aldus are both dealt with in the renaissance group of romans.

#### GOTHIC TYPE<sup>12</sup>

The main groups of gothic type faces were based (like nearly all the type of the early period) on hand-written forms which had been developed before the invention of printing. Textura, the type of the first printed books, was derived from a formal book hand written with a minimum of curves; the letters are upright, narrow, and angular, standing on crooked feet, and the ascenders are usually decorated with barbs or thorns; f and f do not formally descend below the base line.<sup>13</sup> There were three main traditions of textura design: the early German form, seldom seen after the fifteenth century; a late-fifteenth-century French form which, although it did not survive in France itself, was used by English printers throughout the

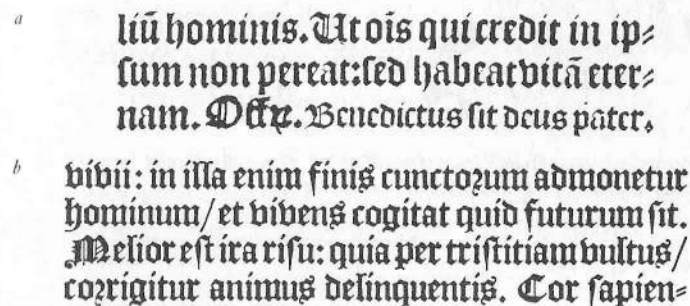


FIG. 3 (a). Late-fifteenth-century French texturas used in London (*Missale Saresberienne*, London (Pynson) 1500, Duff 329; Trin. Coll. Cam. VI. 18. 21, f. 122<sup>b</sup>).

3 (b). Mid-seventeenth-century Dutch textura, the *Augustijn Duyts* of Christoffel van Dijck, with bastarda form of f and f, recast from original materials at Haarlem (Enschede en Zonen, J., *The House of Enschedé 1703-1953*, Haarlem 1953, p. 18).

<sup>12</sup> For an introduction to gothic type see Vervliet, H. D. L., *Sixteenth-century printing types of the Low Countries*, Amsterdam 1968, ch. 3; for further references, see pp. 396-7.

<sup>13</sup> Some sixteenth-century Dutch texturas were provided with alternative forms of f and f with pointed 'bastarda' descenders; see fig. 3 (b).

hand-press period as their normal 'black letter'; and the Dutch form, also late fifteenth-century, and also destined for long life in the Low Countries.

Less condensed as a rule than the texturas, the rotundas are distinguished, as their name suggests, by curved letters c d e, etc. They are true black letters in their great contrast between thick and thin strokes; they have mere thickenings for serifs, and f and f do not have descenders. Some of the smaller and less formal varieties (especially the 'fere-humanisticas') resemble thickened romans, though even these forms were used with obviously gothic capitals. Rotundas were widely used for all but the most formal texts in the fifteenth century, but fell out of fashion during the sixteenth century, surviving longest in Spain.

<sup>a</sup> sua tam reprobis q̄ electis. qui  
omnes cū suis pprijs resurgēt  
corporibus:que nunc gestāt: ut  
recipiant secūdū opera sua siue  
his opa frūgit. ff. d̄ his qui  
no. ifa. ob hec vba. nec id  
excusat hoīem: q̄ cōsilio  
al terius fecit: q̄ debuit ⁊  
potuit explorare apud se

<sup>b</sup> Ciceronem filiū suū. Officioꝝ liber incipit.  
Prefatio generalis in libros omnes.



Vanq̄ te marce fili. annum  
iam audietem cratypū. idq̄  
athem̄s. abundare oportet. p̄  
ceptis. instituitisq̄ phie. p̄t

FIG. 4 (a). Formal rotundas from Venice (Gregorius IX, *Decretales*, Venice (Jenson) 1475, Goff G-449; Trin. Coll. Cam., Gr. 2. 191, f. 3<sup>a</sup>).

4 (b). Formal and fere-humanistica rotundas used by Gutenberg's successors; the initial letter is hand-drawn (Cicero, M. T., *De officiis*, Mainz (Fust and Schoeffer) 1466, Goff C-576; Trin. Coll. Cam. VI. 14. 24, f. 1<sup>a</sup>).

The bastardas were based on a variety of quickly written but not fully cursive book hands, and differ considerably in their degree of formality. The least formal of them, the frequently crude bastardas of England, France, and the Low Countries, generally have rounded letters of small x-height, often with a tendency to forward slope, sprinkled with a number of cursive forms such as single-decker a, d with a flourished ascender, open-tailed g and (most characteristic of the whole group) f and f with pointed descenders. The German bastardas quickly became more sophisticated; chief amongst them were the Schwabacher group (c. 1485-1540), which tended towards the rotundas, and Fraktur (from c. 1512), closer in

spirit to textura. The English, French, and Dutch bastardas went out of use by the mid sixteenth century, but Fraktur, cut with a contrived formality that belied its cursive origins, became the most successful of all the gothic types, surviving as a book face in Germany until the mid twentieth century.

<sup>a</sup> ferer petit. Et ne vous vueillez mpe  
plaindre / car il plaist a vostre pere q̄ vo  
doint Pegne. cest adire qui vous doint  
le Pegne de paradis Vendez ce q̄ vous  
LrLrLr ii

<sup>b</sup> Is ist das Buch von der  
Geburt Ihesu Christi / der da ist ein Sohn  
Dauids / des Sohns Abraham.  
Abraham zeugete Isaac.  
Isaac zeugete Jacob.

FIG. 5 (a). French bastardā; note the use of Lr for K in the signature (*Biblia*, French, Paris (Vérard) c. 1498, Goff B-623; Trin. Coll. Cam. VI. 17. 23, 3K2<sup>a</sup>).

5 (b). German Frakturs (*Biblia*, German, Franckfurt am Mayn (Zephelium et al.) 1560, Adams B1179; Trin. Coll. Cam. A. 11. 7, f. 243<sup>a</sup>).

Civilité is the name that became attached to a group of gothic cursive types, the earliest and best of which were cut in the mid sixteenth century by the French punch-cutter Robert Granjon and by his imitators. They were based on a relatively informal hand, closely related to the English 'secretary', and were fairly popular for a while in spite of their poor legibility and extravagant use of space. The civilités never approached the typographic importance of italic, the roman cursive, but they were used occasionally in France and the Low Countries until the nineteenth century.

Vidi sub sole in loco iudicii impietatem, et in loco  
iustitiae iniquitatem. Et dixi in corde meo: Iustum,  
et impium iudicabit Deus, et tempus omnium rei  
tunc erit. Dixi in corde meo de filiis hominum, ut

FIG. 6. Civilité; Granjon's *St. Augustin* of 1566, Carter and Vervliet A4, recast from original materials at Haarlem (Enschedé en Zonen, J., *The house of Enschedé 1703-1953*, Haarlem 1953, p. 12).

ROMAN AND ITALIC TYPE<sup>14</sup>

Like the early gothics, the first roman type faces were based on a formal book hand, in this case one which had been perfected in Italy by humanistic scribes during the first half of the fifteenth century. Following their model, they were used at first chiefly for editions of classical authors, gothic types being preferred for printing religious and vernacular works. But the superior legibility of roman encouraged its use in all sorts of books. In Italy a few vernacular books had been set in roman from the beginning, and during the early sixteenth century *rotunda* gradually gave way to roman in Italian printing. Roman prevailed at Paris and at Antwerp around 1540, and in other French printing centres a few years later. Books in English began to be set in roman from the late 1550s, although the Bible survived in 'black letter' until 1640. In the Low Countries the Bible continued to be printed in gothic type for even longer, but ordinary books in Dutch went into roman during the second quarter of the seventeenth century. Only in Germany, German-speaking Switzerland, and Scandinavia did ordinary vernacular books continue to be printed in gothic types throughout the hand-press period.

A cursive version of roman, *italic*, was cut as type at the beginning of the sixteenth century and was at first used by itself as a text type; but again it was less legible than roman, and it quickly slipped into subservience to the parent form. Later still the subordination of italic was expressed by type designs that were sloped romans, often lacking in individual character.

*Renaissance romans and italics.* A good many different typographical interpretations of the roman book hand appeared in the fifteenth century, ranging from faces that had so many gothic characteristics as scarcely to be roman at all, to others which pointed the way to a purely roman typography, and which have been followed more or less ever since. We can see with hindsight that two early romans in particular set the pattern for the later development of the face which was to become the standard roman for most of the sixteenth, seventeenth, and eighteenth centuries, and which is still the fundamental influence upon twentieth-century typography. These were the 114-15 mm. romans introduced by the Venetian printers Jenson (in 1470) and Aldus Manutius (in 1495). Much has been made of the dif-

<sup>14</sup> There is no good general introduction to the development of roman and italic type-forms, but on Jenson, Aldus, and Garamont, see Carter, H., *A view of early typography*, Oxford 1969, ch. 4; on van den Keere, Vervliet, H. D. L., *Sixteenth-century printing types of the Low Countries*, Amsterdam 1968, pp. 30-2 and *passim*; on Caslon, Mosley, J., 'The early career of William Caslon', *Journal of the Printing Historical Society*, iii, 1967, pp. 66-81; on Kis, Carter, H., and Buday, G., 'Nicholas Kis and the Janson types', *Gutenberg Jahrbuch*, 1957, pp. 207-12; and on *romain du roi*, Jammes, A., 'Académisme et typographie', *Journal of the Printing Historical Society*, i, 1965, pp. 71-95. See also the further references on pp. 396-7.

- <sup>a</sup> aut inania & furda simulacra malefici dæ  
partes mundi quæ conspiciuntur: aut mo  
aut quæcunq; animalium nocentissima: f  
uatoris sola doctrina cuncti simul græci a  
uerbum Christi audierunt ad tantum pl  
uerum deum regem ac dominum cæli: et
- <sup>b</sup> mus; quas adolescentes, non possumus :  
quo in consilio nobis diutius permanen  
dum esse non puto: nam ut interdum nō  
loqui moderati hominis est; sic semper  
filere cum eo , quem diligas, perignauī:  
neq; Hercule; si in officio permanimus

FIG. 7 (a). Jenson's 115 mm. roman (Eusebius Caesariensis, *De evangelica præparatione*, Venice (Jenson) 1470, Goff E-118; Trin. Coll. Cam. Gr. 2. 111, f. 4<sup>b</sup>).

7 (b). Aldus's 114 mm. roman (Bembus, P., *De Aetna dialogus*, Venice (Aldus Manutius) 1495/6, Goff B-304; Trin. Coll. Cam. Gr. 11. 232, A1<sup>b</sup>).

ferences between these magnificent types, and indeed Jenson's version is perhaps nearer to calligraphy than the Aldine roman, which is cut with a brilliance and regularity that is purely typographic; nevertheless, comparison of good, early impressions of the two shows close similarities between them. Aldus's type is slightly more condensed than Jenson's, with greater x-height and a little less weight; and there are a few unimportant differences of detail—notably the cross-bar of e, which Jenson slopes and Aldus makes horizontal. But the design of individual lower-case letters is remarkably similar, and it may be that Aldus's contemporaries (and perhaps his punch-cutter Francesco Griffo as well) looked upon the type of 1495 as a development or refinement of Jenson's roman of 1470, rather than as something radically new.

At all events the development was approved, and it was Aldus's roman, not Jenson's that was taken as a model by the supremely accomplished French punch-cutters of the 1530s and 1540s, of whom the greatest was Claude Garamont.<sup>15</sup> But these designers did more than copy the Aldine original: they developed it in a whole range of new sizes, and produced a

<sup>15</sup> The spelling 'Garamont' is used here for the punch-cutter, 'Garamond' for his type.

series (as we should say today) of romans hitherto unparalleled for elegance and utility. The quality of these Parisian romans was recognized immediately; matrices, cast type, and even sets of punches were traded all over Europe; Garamond and a few close imitations<sup>16</sup> dominated roman typography for the next hundred years, and remained in production for a hundred years more.

<sup>a</sup> quæ Græci scriptores inanis arrogantia causa sibi assumptarum multa scisse viderentur, ea conquisuerunt, quæ nihil ars difficilior cognitu putaretur: nos autem ea, quæ videtur certinere, sumpsimus. Non enim spe quæstus aut gloria colimus, quemadmodum cæteri, sed ut industria nostra tuæ n

<sup>b</sup> alias interim causas prætendentes, bellum suscepisse. ac tu sum res, & contra Megarenses scitum, & si qua alia volui Fines autem pluribus erroribus scitent. quamvis enim interfuisse, & se omnia polliceatur esse narraturum: tantum Atheniense & Peloponnesiorum, quod prope

FIG. 8 (a). Garamont's first *gros romain* roman, c. 1530 (Cicero, M. T., *Opera*, Paris (R. Estienne) 1538-9, Adams C1640; Trin. Coll. Cam. Z. 6. 18, p. 3).

8 (b). Garamont's second *gros romain* roman, mid 1540s with later revisions; this type remained in production until the mid eighteenth century (Dionysius Halicarnæus, *Scripta omnia*, Francofurti (heirs of A. Wechel) 1586, Adams D625; Trin. Coll. Cam. II. 3. 13, p. 234).

As early as the 1570s, however, a new and powerful version of the renaissance roman was cut for Plantin by Hendrik van den Keere, a Belgian punch-cutter of great skill and originality. It had increased contrast and x-height in the lower case and a hefty set of capitals; and, although its distribution was limited at first, it was eventually to have a decisive influence on the development of renaissance roman. For by the early seventeenth century the centre of type production was moving from Paris to the Lower Rhine, and the roman model taken by the most successful Dutch punch-cutters (such as Cristoffel van Dijck of Amsterdam) was that of van den Keere. The Low Countries romans of the seventeenth century followed his lead in contrast and x-height, but they were cruder faces, provincial for all

<sup>16</sup> Not to be confused with several twentieth-century types of the same name, which are based on different designs.

¶ Nolite diligere mundum, neque ea quæ in mundo sunt. Si quis diligit mundum, non est charitas patris in eo: quoniam om

ltro, tanti Principis, lumine perfundi spei ego illum ederem, suavit, tum ipsius Viritas, tum Muneris quo fungor ratio.

FIG. 9 (a). Van den Keere's *ascendonica* roman lower case of 1576 with Granjon's capitals, Vervliet R18 (Vervliet, H. D. L., *Sixteenth-century printing types of the Low Countries*, Amsterdam 1968, p. 251).

9 (b). Anglo-Dutch double pica roman cut at Oxford, c. 1682 (Morison, S., *John Fell*, Oxford 1967, p. 155).

their vigour. They suited the taste of the time, nevertheless, English printers preferring to buy type from the Dutch foundries although the Garamond romans were still available in France; and when the Oxford and Cambridge University Presses were re-equipped with the best available typographic materials late in the century, type and type-founding apparatus were obtained from the Low Countries; Oxford also employed a German-Dutch punch-cutter, Peter de Walpergen.

Yet another reinterpretation of the renaissance roman face was made in the eighteenth century, in England, where William Caslon began his urbane imitations from the Dutch in the 1720s. Caslon rejected the brash contrast of the later Dutch founts, and produced types that were without serious blemish, but also without much life; they were tasteful, subdued, and rather dull. Nevertheless they were so much better than anything else that

ce, by which they were enabled to discover the pothe heavens, with vastly more ease, than we could it could have been imagined more, than that they rided with some fitter astronomical instrument for se than we? That any stone should have so amaz-

FIG. 10. Caslon's great primer roman of 1728, leaded (Pemberton, H., *A view of Sir Isaac Newton's philosophy*, London (Palmer) 1728; Trin. Coll. Cam. T. 10. 116, p. 13).



was readily available (imported type was necessarily harder to get and more expensive than the local product) that British printers rapidly re-equipped with Caslon. These types were imitated in their turn (notably by the Scottish founder Alexander Wilson in the 1740s and 1750s, and by Isaac Moore of Bristol in the 1760s), but most English books of the middle and late eighteenth century were printed in type from the Caslon foundry. After a period of disuse at the beginning of the nineteenth century, Caslon roman was revived, and has been available ever since from Caslon's successors.

The first italic type was an 80 mm. fount cut for Aldus by Griffio (the punch-cutter who, probably, had produced the influential Aldine roman of 1495), and it was used initially for the text of a series of octavo classics that began to appear in 1501. Its x-height was notably small, and the fount was equipped with many ligatures (tied letters) and with upright capitals; it was quickly and widely imitated.

Next came a group of 'calligraphic' italics based on the *cancellaresca* hand and initiated in 1524 by the writing master Lodovico degli Arrighi (called Vicentino). They too had upright capitals, but were distinguished by the curved ends of their long ascenders and descenders. They were used, almost exclusively for text settings, until the early seventeenth century.

<sup>a</sup> Matre pulchra filia pulchrior,  
o Quem criminosis cinque uoles modum  
Pones iambis, siue flamma,  
Siue mari libet Adriano.  
N on Dindymene, non adytis quatit  
Mentem sacerdotum incola Pythius  
Non liber aequae, non acuta  
Sic geminant corybantes aera

FIG. 11 (a). Aldus's 80 mm. italic of 1501 (Horatius Flaccus, *Q.*, *Opera*, Venice (Aldus Manutius) 1501, Adams H854; Trin. Coll. Cam. Gr. 11. 3, b2<sup>a</sup>).

<sup>b</sup> S e fosse s'parso in far salubri effitti  
A l'infelice Grecia, ch'ognibor langue  
I n serviti, sarebbe fuor d'affanni.  
E l'tempo, che s'è speso in nostri danni,  
S arebbe andato in mille belle ludi;

11 (b). The Arrighi-Lautizio *cancellaresca corsiva* italic of 1524, with added epsilon and omega (Trissino, G. G., *Canzone*, Rome (Arrighi and Perugino) c. 1524, Adams T948; Trin. Coll. Cam. Gr. 10. 45, A3<sup>a</sup>).

Both the Aldine and the Vicentine italics were gradually superseded in the mid sixteenth century by a more practical form of the face emanating from Paris, which had sloped capitals, fewer ligatures, and a relatively large x-height. The finest and most influential of these French italics were the work of Robert Granjon, an artist of the stature of his countryman and

near-contemporary Garamont and one of the greatest all-round type designers of any period. Appearing from the 1540s to the 1560s, Granjon's italics were a perfect complement to the Parisian romans; they could be used alone, as at first they generally were, or they could be combined with roman for picking out particular words or passages. Like the romans, the French italics set the pattern for the standard renaissance founts of the later hand-press period. Van den Keere did not cut an italic, but van Dijck's widely-used italics of the mid seventeenth century were slightly coarsened versions of Granjon's types, and Caslon based his spidery italic on the van Dijck design.

Q V I S neget inuentum Germanorum ingeniosum  
C artula quo recipit tot monumenta typis?  
Q uo quicquid factum est unquam, scripsitque vetustas  
A sseritur, cupide posteritas ve legit.  
Q uot regum historia latuissent, dicta sophorum,  
T euthonicus recte ni reparasset honos!

D V M latitans domi porta vagor, mensaque paratu  
O rno, vel in venerem luxuriosa vocor:  
O mnes certatim redimunt, me colligit usus,  
D elitijs noqueo tum exaturare famem.  
D eposui quando concham, (qua grata voluntas)  
P roteror, aut risu saepe reuoluor humi.

Graeco, restituere me & emendare posse confiderem; sed quod is omnium veterum maxime vel merito suo vel genio quodam & placendi sorte in manibus hominum pectoribusque haereret. Formam vero & institutum operis sic mihi definiui

now explained, viz. That all Men are not capable, or sufficient Judges of the Truth and Divinity of the Gospel, for want of that previous Disposition which is requisite (at least in some

FIG. 12 (a, b). Two influential italics by Granjon: (a) the *mediane cursive pendante*, 1562, and (b) the *mediane cursive droite à l'allemande*, 1565 (Sambucus, J., *Emblemata*, Antwerp (Plantin) 1566, Adams S219; Trin. Coll. Cam. Gr. 3. 96, Q4<sup>a</sup>, C1<sup>a</sup>).

12 (c) The *augustijn cursij* of Christoffel van Dijck, c. 1655, in use at Cambridge (Horatius Flaccus, *Q.*, *Opera*, ed. Bentley, R., Cambridge Univ. Press 1711, McKenzie 97; Trin. Coll. Cam. Z 2. 39, c2<sup>a</sup>).

12 (d). Caslon's english italic of 1727 (Sharp, T., *An enquiry into the causes of infidelity*, London [Bowyer] 1730; Trin. Coll. Cam. X. 36. 13<sup>a</sup>, p. 27).

*Baroque romans and italics.* Although all the early types were copied from existing book hands, the medium of the steel punch both eliminated the random irregularities of hand-written letters, and encouraged the regularization of the letter forms by the repetition of stock elements of design in different letters; efforts were made to retain the effect of irregularity by providing ligatures and alternative forms of some of the letters, but were only partly successful. The next stage, which first became important in the seventeenth century, was to develop new designs, specifically for type, which made a feature of the mechanical element in type production. A variety of influences helped to direct the form that these developments took: intellectual analyses of letter-forms in the sixteenth and seventeenth centuries, the new calligraphy of the seventeenth-century writing masters with its brilliant contrast and near-vertical stress,<sup>17</sup> the economic advantages of narrow letters, and the increase of legibility with x-height.

There were two main trends in the new type-designs of the seventeenth and eighteenth centuries: one was towards an increase of contrast, combined with a movement of stress from oblique to vertical; the other was towards narrower types of large x-height. These trends are to be found both separately and combined in the very various seventeenth and eighteenth century types now called baroque. Their history is complex, but the following developments were especially important.

Part of the new approach—increased contrast and large x-height—had been foreshadowed by van den Keere's romans of the 1570s; and some remarkable 'modern' titling capitals with almost vertical stress and virtually unbracketed serifs which appeared in Rome in 1613–14 were produced in association with roman founts that were undoubtedly influenced by van den Keere.<sup>18</sup> Very similar capitals were made in Germany during the later seventeenth century, this time in association with a new style of roman lower case, a very narrow letter, still with oblique stress but of great x-height; the finest example, probably cut by the Hungarian Nicolas Kis in the 1680s, is better known by the names of the Leipzig foundries of Janson and Ehrhardt which owned the matrices. This new roman spread during the remainder of the century to other German foundries, and appeared in even more exaggerated forms, with the beginning of a tendency towards vertical stress. The German italics which generally accompanied these romans were also condensed letters of great x-height, but in this they were more like their renaissance predecessors than were the romans, the italic

<sup>17</sup> *Contrast*: the difference in weight between the thick and the thin strokes. *Stress*: the alignment of the thick and thin strokes; in vertical stress the vertical strokes are thick, the horizontal strokes thin.

<sup>18</sup> Vervliet, H. D. L., ed., *The type specimen of the Vatican Press 1628*, Amsterdam 1967, facsimile pp. 27, 50, 53.

*triginta annos tyrannidem tenuit. Ad hunc me  
Hafnia anno 1593 Cragius, similiter edidit Tc  
ma Leidensi idem retinente, quod utique indi  
nis. Sic quum præmissum esset ab Lacedæmonii  
bus summa sit in republicâ potestas; additur  
nem Nulli enim assurgunt Lacedæmonii, præte*

FIG. 13. Text roman and italic in the Janson–Ehrhardt style, perhaps by Nicholas Kis, c. 1685 (Gronovius, J., *Thesaurus Graecarum antiquitatum*, vol. vi, Lugd. Bat. (van der Aa) 1699; Trin. Coll. Cam. W. 3, 18, a2<sup>b</sup>).

retaining calligraphic forms and showing a general similarity to the Dutch italics of the mid seventeenth century.

Another influential new type of the later seventeenth century was the *romain du roi* designed for the Imprimerie Royale by a team of Academicians under the Abbé Jaugeon, and cut with some modification during the 1690s by Philippe Grandjean. The proportions of the roman letters were deliberately taken from Garamont's romans, but otherwise the design was entirely original. For the first time the stress was uncompromisingly vertical, while the italic was intended to be a mechanically sloped roman, quite unconnected with calligraphy. (There were also some minor peculiarities of the design that were not imitated elsewhere: ascenders with serifs on both sides, spurred 'l', etc.)

*ette médaille, où l'on voit Astrée qui descend du  
its de la Paix, de la Justice & de l'Abondance. La  
, SPES FELICITATIS ORBIS. PAX ULTRAJECTEN-  
CCXIII. signifient que le monde espéra un bonheur*

FIG. 14. The caractères du roi of Jaugeon and Grandjean, 1690s, petit parangon roman and italic (Louis XIV, *Médailles sur les principaux événements du règne entier de Louis le Grand*, Paris (Imp. Roy.) 1723; Trin. Coll. Cam. Y. 16. 11, p. 313).

The various new features of roman type design first seen in the seventeenth century—increased contrast, vertical stress, condensation, large x-height, sloped romans—were combined in various ways by a number of eighteenth-century punch-cutters who, like the French Academicians, were conscious innovators. Prominent amongst them were J. M. Fleischman, a Bavarian working in Holland in the 1740s; Louis Luce and P. S. Fournier, Parisian contemporaries of Fleischman; John Baskerville of

<sup>a</sup> ut curiose intelligerem: Sunt iusti atque sapientes, et opera eorum in manu Dei: et tamen nescit homo utrum amore, an odio dignus sit: sed omnia in futurum servantur incerta, eo quod universa æque eveniant iusto et impio, bono et malo, mundo et im-

<sup>b</sup> quantité de bien & de mal, qui rend en un sens toutes les conditions égales. Si les Rois ont plus d'agrémens *parce qu'elle nous est moins connue. Elle ressemble à ces figures d'Optique, qui de loin représentent une belle*

<sup>c</sup> *Gratum opus agricolis: at nunc horrentia Martis*

**A** RMA, virumque cano, Trojæ qui primus ab ori  
Italiam, fato profugus, Lavinaque venit  
Litora: multum ille et terris jactatus et alto,

<sup>d</sup> cenatis non folum servatus, sed etiam in amicitiam receptus est. Quapropter Maecenati et Augusto in omnibus Scriptis fuis venerabiliter adfurgit. Scripsit Carminum

FIG. 15 (a). Fleischman's *Augustyn* roman, 1740s, recast from original materials at Haarlem (Enschedé en Zonen, J., *The house of Enschedé 1703-1953*, Haarlem 1953, p. 24).

15 (b). The *St Augustin* roman and italic of P. S. Fournier, c. 1740 (*Encyclopédie*, ii, Paris 1751; Trin. Coll. Cam. 301. a. 1. 2, p. 663).

15 (c). Baskerville's great primer roman and italic of 1754-7, leaded (Vergilius Maro, P., *Opera*, Birmingham (Baskerville) 1757, Gaskell 1; Trin. Coll. Cam. Z. 11. 98, O1\*).

15 (d). The third english roman, leaded, of the Wilson foundry, 1760 (Horatius Flaccus, Q., *Opera*, Glasgow (Foulis) 1760, Gaskell 383; Trin. Coll. Cam. Roth. C. 1. 6, p. xi).

Birmingham, printer and type-founder from the 1750s; and Alexander Wilson, a Scot who was both a type-founder and a professor of astronomy, and whose most original typographical work was done in the 1750s and 1760s. Most of the italics which accompanied the mid-eighteenth-century baroque romans followed traditional renaissance patterns, but Fournier paid little attention to the old calligraphic forms; while Baskerville's italic was a lean, elegant letter, the most radical departure from tradition since the French academic italic of the 1690s, with its roots in the calligraphic innovations of the late-seventeenth- and early-eighteenth-century writing masters.

*Neo-classic romans and italics.* Most of the individual features of the fully neo-classic (or 'modern') face were included in the baroque romans which became increasingly popular during the second half of the eighteenth century, especially in England. But one further development remained to be made, and this last, logical step was taken by F. A. Didot (one of a talented family of Parisian printer-founders) in the early 1780s. The baroque designers, although they favoured strong contrast and had experimented with vertical stress, nevertheless retained the sloped and bracketed serifs that derived from obliquely-stressed pen forms; even the unusual two-sided flat serifs of the *romain du roi* had been bracketed. Didot's new roman of 1784, however, at last fulfilled the logic of vertical stress; the ascender serifs of the lower case were thin horizontal lines without brackets.

*Israëlitæ manna colligunt; die sexto duplum colligunt. Lex de manna asservando in urna coram Domino collocanda.*

1. PROPECTIQUE sunt de Elim, et venit omnis multitudo filiorum Israel in desertum Sin, quod est inter Elim et Sinai, quintodecimo die mensis secundi, postquam egressi sunt de terra Aegypti.

2. Et murmuravit omnis congregatio filiorum Israel contra Moysen et Aaron in solitudine.

FIG. 16. F. A. Didot's corps dix (81 mm.) roman of 1784, with corps sept italic (*Biblia*, Latin, vol. i, Paris (Didot) 1785; Trin. Coll. Cam. Gr. 22. 1, p. 168).

Didot's first neo-classic type did not show marked contrast, but later developments of the form, by Didot himself and by Bodoni in Italy, resulted by 1800 in faces of great contrast combined with vertical stress and unbracketed, hair-line serifs. The italics that accompanied all these faces were sloped romans, varying in contrast in the same way as their parent forms,

and seldom showing any trace of renaissance broad-pen calligraphy. The later development of these types is discussed on pp. 209-13.

GREEK TYPE<sup>19</sup>

Only one exotic alphabet, namely greek, was of major importance in western European typography, for the hebrew, arabic, and other near-eastern alphabets cut as type during the hand-press period for works of biblical exegesis were narrowly confined to specialist printers. But printing in the classical languages was widespread, and most printers kept a fount or two of greek, even if it was no more than a small one used for setting a few words of Greek within a Latin text.

Greek typography in the fifteenth century was largely experimental. One style, associated with Jenson, was based on a latinized hand, in which the letters were generally square, upright, and separated from each other, but it need not concern us here since it was superseded late in the fifteenth century by a more cursive style and was not revived until recent times. The cursive style of greek type, however, was an immediate success; introduced by Aldus in the 1490s and perfected by Garamont and Granjon in the mid sixteenth century, it dominated greek typography for nearly 300 years.

The Aldine greek was based on a form of humanistic cursive hand which relied for its good looks on a multiplicity of alternative letters, ligatures, and contractions. It was an unfortunate model for type, not because it was ugly or difficult to read—we find it difficult because its abbreviations are unfamiliar nowadays, but scholars of the sixteenth and seventeenth centuries preferred it to the latinized hand—but because it was unsuited to typography: founts of cursive greek required 450 or more sorts of type, three times as many as a fount of roman. But the influence of the awkward Aldine originals of the 1490s, and then of the superb interpretations of Garamont (1540s) and Granjon (1560s), was irresistible.

It was possible to make a fount of cursive greek with fewer punches than there were to be sorts; vowel punches and accent punches were cut separately and then tied together in different combinations for striking the matrices (a device also used occasionally in making accented sorts for roman founts). Alternatively vowels could be cast without accents as kerned letters, with bodies only half as wide as usual, part of the face being cast on the overhang, or kern. Accents were cast separately on narrow bodies which were then combined with the kerned vowels to make accented sorts. Both methods were in use by the early sixteenth century, although printers pre-

<sup>19</sup> Scholderer, V., *Greek printing types 1465-1927*, London 1927.

ΣΑ Δὴ δὲ δηγματῶν  
μαυτοῦ καρδίαν.  
Ἡδὴν ὁ βασιλεὺς πάντων δὲ  
βασιλεὺς τῆς πατρῴας.

αὐτὴ δὲ μετὰ τὴν δυνάμει ἡλεί  
πειν ἢ κατὰ πρόθεσιν· ἴνῃ  
ἡτῆ τῶν μαυτοῦ καρδίαν.  
ὁ καὶ βέλπον, ὅτι μετὰ φέ  
ρετὴ ἀπὸ τοῦ βίου τῶν τῶν κτ

Θεῶταρι Αὐτοκρατορες Σεκῆρος, καὶ Αντωνέως τῆς Σ  
Κλαυδίῳ Ρεφῶν ὁ πολέτης ὑμῶν, ὁ διὰ τὴν ποθε  
πίεσιν Ἰπὶ παιδεία καὶ τὴν ἐν λόγοις συνεχῆ βίον, τῶ  
ῶ χειμῶν τῆς Σοφίαις καὶ τῆς Θείας τῆς πογόνων

FIG. 17 (a). Aldus's 146 mm. and 114 mm. greeks of 1495-6 (Aristophanes, *Comœdia novem*, Venice (Aldus) 1498, Goff A-958; Trin. Coll. Cam. N. 4. 2, χ<sup>2a</sup>).

(b). Granjon's *gros parangon* greek, 1565, after Garamont, recast from original materials at Oxford (Morison, S., *John Fell*, Oxford 1967, p. 99).

ferred to use unkerneed sorts, keeping the kerned vowels for emergencies.<sup>20</sup>

Aldus himself reduced the number of ligatures and contractions in one of his later greek founts (the 80 mm. greek of 1502), but it was his earlier, multi-ligatured founts that were followed; and, from the middle of the sixteenth century until the middle of the eighteenth, printers used the best copies they could get of Garamont's interpretation of the humanistic cursive. During the same period there was a tendency to reduce the number of sorts in a fount of greek by deleting some of the least-used ligatures and contractions; by the 1740s the Scottish founder Alexander Wilson was producing greek types that were avowedly based on Garamont's designs, but which had only some eight alternative sorts and eighteen ligatures and contractions.

It was the same Wilson who made the first deliberate break with the Aldine tradition in the 1750s with a fine double pica greek which, although its letter-forms were closely related to those of Granjon's design,

<sup>20</sup> Vervliet, H. D. L., *Sixteenth-century printing types of the Low Countries*, Amsterdam 1968, p. 11 shows a 'stepped' punch; for kerned accents see Morison, S., *John Fell*, Oxford 1967, pp. 98, 257.

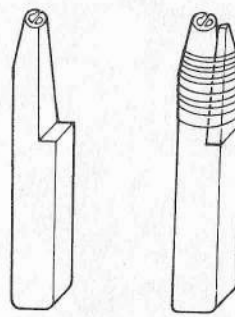


FIG. 18 (a). Stepped vowel punch, with separate accent punch.

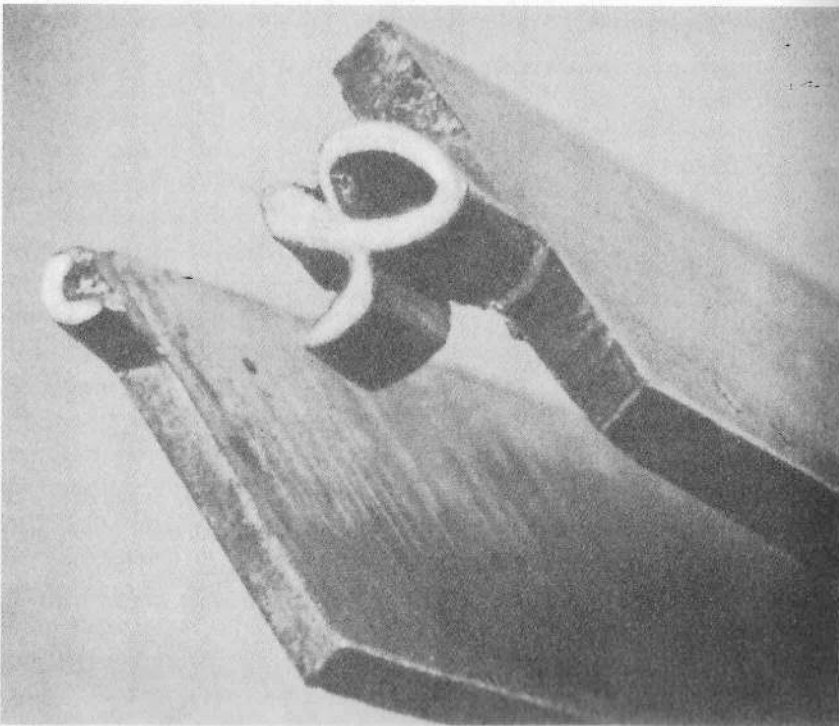
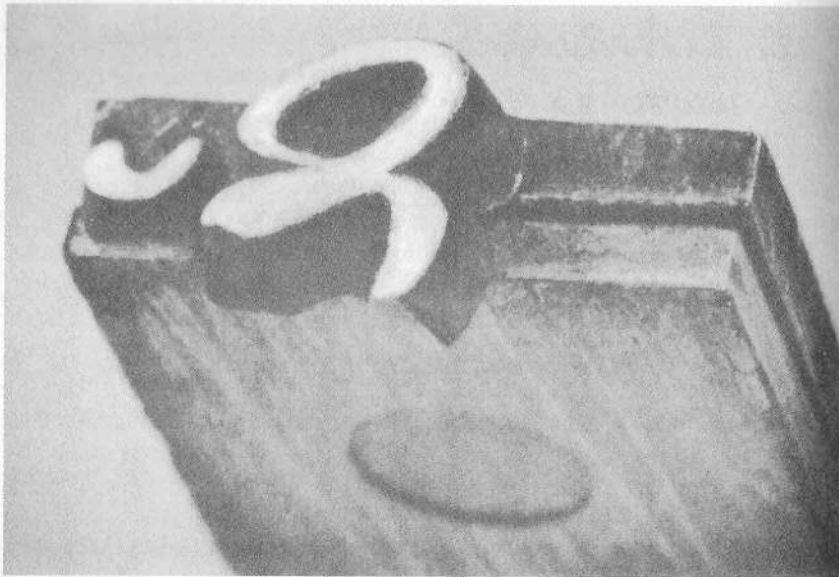


FIG. 18 (L). A piece of greek type—the vowel alpha—formed for use with separate matrices. Above here is mounted with a matrix.

was intended for use with no more than a few ligatures, and with none of the old contractions.

Πάντες ἄμα, Ζεὺς δ' ἦρχε· Θέτις δ' εἰ λήθει' ἐφείμ  
 Παιδὸς εἶ, ἀλλ' ἦγ' ἀνεδύσατο κῦμα θαλάσσης,  
 Ἥρις δ' ἀνέβη μέγαν ἔρανόν, Οὐλυμπόν τε·

FIG. 19. Alexander Wilson's double pica greek, second version, 1756 (Homer, *Works*, Glasgow (Poulis) 1756-8, Gaskell 319; Trin. Coll. Cam. II. 11. 17, i, p. 21).

But the ligatures and contractions were going out of use in any case; from the middle of the century printers all over Europe used them less and less, even with founts of Aldine character. At the same time further experiments in designing greek without ligatures were made by Baskerville, Bodoni, and others, and new, simpler forms were becoming commercially available at the end of the hand-press period.

#### FOUNTS, CASES, AND TYPE-STOCK

A fount of type was a set of letters and other symbols in which each sort was supplied in approximate proportion to its frequency of use, all being of one body-size and design. A fount of roman type consisted of CAPITAL LETTERS, SMALL CAPITALS, small ('lower case') letters, accented letters, ligatures (tied letters such as ffl, made from a single punch and matrix), punctuation marks, figures, and a few special symbols such as &, \*, <sup>R</sup>, etc.; this usually added up to about 150 sorts, and there were in addition spaces to go between words (short pieces of type of various thicknesses without letters cast on them) and quads (very wide spaces) for filling out blank lines, which were specific to the body but not to the design. Italic founts, which lacked small capitals, generally had about the same total number of sorts as roman because of the addition of extra ligatures and decorated (or 'swash') capitals.

A special form of tied letter appears to have been made in the fifteenth and sixteenth centuries by placing the matrices for several letters side by side in the mould, and casting them all together as a single type. Like the matrices for music type (in which the lines of the stave have to run right across the face of the type to join the lines of the types on either side), matrices were specially justified for this purpose without the usual margin on either side of the impression of the punch. Tied letters made in this way may be difficult to distinguish from true ligatures made from a single

<sup>a</sup> ABCDEFGHIJKLMNOPQRSTUVWXYZÆ Qu V X Ç & (1)  
 ABCDEFGHIJKLMNOPQRSTUVWXYZÆ (26)  
 abcdefghijklmnopqrstuvwxyz æ œ fffñ ſt ſñ ſt ſñ ſt ſñ ſt ſñ ſt  
 àáâã ä éêëèē ē ìíî ï úùúü ü óð ò õ ñ q q̄ (68)  
 . . , ; : ? ! - - [ ] \* \* † ‡ (17)  
 1 2 3 4 5 6 7 8 9 0 (10)



<sup>b</sup> ABCDEFGHIJKLMNOPQRSTUVWXYZÆ [27]  
 abcdefghijklmnopqrstuvwxyzæ œ ij ÿ ll ã st as is us ff fi fl fr ffi fl fi fl ff fl st  
 á à â ä é ê ë è é ì í î ï ó ò ù ú û ü ã ē ÿ ŷ Ÿ p p̄ q̄ q̄ w̄ ȳ [35]  
 , ; : ! ? ) [6]  
 1 2 3 4 5 6 7 8 9 0 [10]

FIG. 20. Synopses of founts of sixteenth-century roman and italic type, cast from original materials at Oxford: a pica roman of mixed origin, perhaps partly by Garamont; and Granjon's *mediane cursive droite à l'allemande* (cf. Fig. 12 (b)). They total 153 and 127 sorts respectively. The italic lacks an ampersand and alternative swash capitals other than V and Z. Spaces and quads, printed high between the synopses, show as black rectangles (Morison, S., *John Fell*, Oxford 1967, pp. 133, 139).

matrix.<sup>21</sup> Another device was to make matrices for accented sorts with the punches already used for unaccented sorts: the letter punch was stepped on its shank so that one of several accent punches could be bound on to the step to make a combined punch (fig. 18 (a)).<sup>22</sup> Type was stored for use systematically in cases, large wooden trays that were divided into little compartments (boxes), one for each sort. The 'lay' of the case—that is, the conventional order in which the sorts were arranged in the boxes—followed one of two traditional patterns which were certainly established by the mid seventeenth century and probably long before.<sup>23</sup> The earlier of the two, the single lay, employed one large, squarish case for a fount of type, and it held about 34 kg. (75 lb.) of type when it was full. The capital letters were arranged in rows of equal-sized boxes along the top of the case, with the small letters in boxes of various size beneath them. The single lay appears to have been the normal form everywhere until the mid sixteenth century, and it remained in use in the German-speaking countries throughout the hand-press period.

The other traditional pattern, the divided lay, employed two cases to a

<sup>21</sup> Carter, H., *A view of early typography*, Oxford 1969, pp. 20-1.  
<sup>22</sup> Vervliet, H. D. L., *Sixteenth-century printing types of the Low Countries*, Amsterdam 1968, p. 11.  
<sup>23</sup> Gaskell, P., 'The lay of the case', *Studies in bibliography*, xxii, 1969, pp. 125-42.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	2	3	4	5	6	7	8	9	0	æ	œ	ñ	ó	õ	ŷ	ÿ	z	z̄
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s
ff	fi	fl	fr	ffi	fl	fi	fl	ff	fl	fi	fl	ff	fl	fi	fl	ff	fl	fi
		u																
		( )	f	h	i	m	i	n	o	p	q	z	ff					
			c	b	a	Epat.	e	d	g	f								
			x	æ	ç	/	.	ˆ	:	ˆ								

FIG. 21. Seventeenth-century German single lay for gothic type (Wolffger, G., *New-auffgesetztes Format-büchlein*, Graz 1672; St. Bride 20958, facing f. 1).

fount, each of them being smaller and more oblong than the single-lay case; deep ones could take 18-20 kg. (40-5 lb.) of type each, but pairs were usually filled with about 27 kg. (60 lb.) in all. Capitals, small capitals, and (sometimes) figures were placed in the boxes of the upper case, which were all of a size, while the small letters, punctuation marks, and spaces went in the variously-sized boxes of the lower case.<sup>23a</sup> Plantin had cases of both the single and the divided lay made for him in 1563-7, and English printers were referring to 'pairs' of cases by 1588; the divided lay was used in France by 1723 and probably before.<sup>24</sup> There were national variants of the divided lay. In one form of the lower case, found in Holland and France (and also at the Oxford University Press, where French compositors were employed in the later seventeenth century), the letters h and y were kept in small, peripheral boxes. In the English national variant of the lower case, however, h and y, more used in English than in French, were kept in larger boxes near the middle of the case. A divided lay something like the French version was known in Spain; while American printers adopted the English pattern. Details of early Italian lays are lacking, but there is some evidence that a divided lay was used by the later hand-press period.

<sup>23a</sup> 'Upper' and 'lower' cases because they were placed one above the other on the compositor's frame. Type set in capitals is sometimes said to be in upper case, and type in small letters to be in lower case.  
<sup>24</sup> Voet, L., *The golden compasses*, ii (there are no page references in the present work to *The golden compasses*, vol. ii, which was still in manuscript when Dr. Voet kindly allowed me to see it); Gaskell, P., *op. cit.*, pp. 128-9.

A	B	C	D	E	F	G	A	B	C	D	E	F	G
H	I	K	L	M	N	O	H	I	K	L	M	N	O
P	Q	R	S	T	V	X	P	Q	R	S	T	V	X
à	ê	î	ô	û	Y	Z	fl	ff	J	U	Y	Z	!
á	é	í	ó	ú	J	U	fl	fl	Æ	Æ	W	W	?
à	è	ì	ò	ù	<i>Apost.</i>	ft	ff	ff	ë	ï	ü	j	<i>denonion</i>

ç	ç	k	w		1	2	3	4	5	6	7	8
&	b	c	d	e	s	f	f	g	h	9	o	
æ	l	m	n	i	o	p	q	ffi	ffi	;	:	
z								fi	fi	<i>dem</i>	<i>Cudra</i>	<i>ctioe</i>
y	v	u	t	<i>Espaces</i>	a	r	.	,				<i>Cadmits</i>
x												

FIG. 22. Divided lay, French pattern, early eighteenth century (Fertel, M. D., *La science pratique de l'imprimerie*, Saint-Omer 1723; U.L.C. 7850. c. 46, f. p. 12).

Lays for exotic founts were usually adaptations of those used for the latin alphabet. Thus English learned printers would lay their hebrew or arabic founts in pairs of ordinary cases; while Russian printers laid cyrillic type in a single case, following a transliteration of the German arrangement. The greek cursives were a necessary exception, and a French manual of 1723 shows a fount of cursive greek similar to Garamont's laid in three pairs of special cases, in a total of 750 boxes.<sup>25</sup>

Printers ordered founts of particular sizes either by specifying the total number of letters required, or by weight; and founders charged for the cost of the metal plus the cost of casting or, in the eighteenth century, by weight

<sup>25</sup> Fertel, M. D., *La science pratique de l'imprimerie*, Saint-Omer 1723, f. pp. 13, 14.

A	B	C	D	E	F	G	A	B	C	D	E	F	G
H	I	K	L	M	N	O	H	I	K	L	M	N	O
P	Q	R	S	T	V	W	P	Q	R	S	T	V	W
X	Y	Z	Æ	J	U	Œ	x	y	z	Æ	J	U	
1	2	3	4	5	6	7	â	ê	î	ô	û	¶	§
8	9	o	fb	fk	fi	ffi	â	è	ì	ò	ù	†	‡
1	ë	ï	ö	ü	ft	k	á	é	í	ó	ú	ll	*

æ	]	æ	æ	ç	'		s	()	?	!	;	fl	ff
&												ff	ff
m	b	c	d	e			i	f	f	g	sh	fi	fi
j													
HS	l	m	n	h			o	y	p	q	w	n	m
z													
x	v	u	t	<i>Spaces</i>			a	r	,	:			<i>Qu.</i>

FIG. 23. Divided lay, English pattern, eighteenth century (Smith, J., *The printer's grammar*, London 1755; U.L.C. 860. d. 44, pp. 186-7).

alone, the small bodies costing more per unit of weight than the large. Founts were supplied in quantities approximately proportional to the frequency of use of the various sorts, the fount schemes or 'bills of letter' being worked out by the founders. In the eighteenth century a 'full bill' was based on a quantity of 3,000 lower-case letters m, and included 7,000 a, 12,000 e, 400 x, 800 A, and so on, plus spacing material and italic; a full bill of roman plus half a bill of italic weighed 365 kg.<sup>26</sup> Large types for display were supplied in smaller numbers, and might be charged for by the piece; thus a printer might order a 20-m fount of canon roman, and get 40 a, 60 e, 20 m, 8 x, 14 A, etc.

Full bills of text types were bulky as well as heavy—a full bill of pica occupied about 16 pairs of cases—and type that was not in use was stored in baskets or paper wrappers. Eighteenth-century printers used fount cases

<sup>26</sup> Figures (which varied a good deal) from Smith, J., *The printer's grammar*, London 1755, pp. 38-48. See also Voet, L., *op. cit.*, ii, and Moxon, J., *op. cit.*, p. 19 n.

for storage, which were arranged like ordinary cases but were some three times deeper than usual.

But few printers of the earlier hand-press period kept type in these eighteenth-century quantities. French printers of the seventeenth century were accustomed to buy founts of around 100,000 pieces of pica (about 180 kg.), and other sizes in proportion;<sup>27</sup> while Jaggard printed the whole of the Shakespeare First Folio with a worn fount of pica which can have weighed no more than about 90 kg. (200 lb.).<sup>28</sup> Many printers' inventories have survived, which show that total stocks of type were characteristically between 225 and 900 kg. of type per press in the sixteenth and early seventeenth centuries (often including a considerable proportion of worn type waiting to be melted down), and between 450 and 2,250 kg. per press in the later seventeenth and in the eighteenth century.<sup>29</sup> Plantin of Antwerp was exceptional in the later sixteenth century in possessing nearly 21,000 kg. of cast type; this worked out at 3,500 kg. for each of the six presses he usually operated (though at one time he was working sixteen presses at 1,300 kg. of type for each).<sup>30</sup> In 1588 Thomas Thomas, Cambridge University printer, had one press and 1,400 kg. of type, but 40 per cent of the type was old metal waiting to be melted down; of the rest, 22 per cent was standing in pages, 22 per cent was in cases, and 16 per cent was in store. Cantrell Legge, another Cambridge University printer, also had a single press in 1625, but only 550 kg. of type.<sup>31</sup> After its reorganization at the end of the seventeenth century, the Cambridge University Press normally operated two presses, and had about 1,000 kg. of type for each.<sup>32</sup> The large book-printing house of Schipper in Amsterdam owned eleven presses in 1755 and 1,150 kg. of type for each,<sup>33</sup> while a small provincial office bought by the Société Typographique de Neuchâtel in 1769 had three presses and 625 kg. of type for each of them.<sup>34</sup> In 1800, finally, Strahan the King's Printer in London owned nine presses and 2,000 kg. of type for each.<sup>35</sup>

No two printers of the hand-press period possessed stocks of exactly similar founts of type and of ornaments; a printer's typographical equipment was unique, and identifiably so. In the fifteenth and early sixteenth

<sup>27</sup> Martin, H. J., *Livre, pouvoirs et société à Paris au XVII<sup>e</sup> siècle*, Genève 1969, i, p. 369 and n. 19.

<sup>28</sup> Calculated from Hinman, C., *The printing and proof-reading of the first folio of Shakespeare*, Oxford 1963, i, pp. 49-50, 73-4, etc.

<sup>29</sup> List in Gaskell, P., *The decline of the common press*, Cambridge University Ph.D. thesis 2902, 1956, p. 217; and further inventories collected since 1956.

<sup>30</sup> Voet, L., 'The making of books in the renaissance', *Printing and graphic arts*, x, 1966, p. 59 (44,000 Antwerp pounds).

<sup>31</sup> Gray, G. J., and Palmer, W. M., *Abstracts from the wills . . . of printers . . . of Cambridge from 1504 to 1699*, London 1915, pp. 70-1, 83.

<sup>32</sup> McKenzie, D. F., *The Cambridge University Press 1696-1712*, Cambridge 1966, i, ch. 3.

<sup>33</sup> *Catalogus der letteren . . . boekdrukkery . . . weleer behoort hebbende aan de weduwe van Jan Jacobsz. Schipper*, Amsterdam 1755.

<sup>34</sup> S.T.N. MS. 1236, f. 58.

<sup>35</sup> B.M. Add. MS. 48910.

centuries, when printers usually had founts cast up from their own matrices in their own moulds, there would be minor differences of thickness, of body size, and of individual variant sorts, even between founts that derived ultimately from the same basic set of punches. Thus in the period 1485-1501 at least fifty printers in Germany and Switzerland acquired founts of Schwabacher in body sizes around 90 mm. to 20 lines which can be distinguished from each other by their variant letters, etc., but which derived from no more than about eight sets of punches.<sup>36</sup> (Incunabulists, indeed, work on the assumption that a fount belonging to a fifteenth-century printer was unique to him, which is likely to be true enough of the fount as cast, but is not necessarily true of its punches.)

From the later sixteenth century until the end of the period, when printers increasingly bought complete founts of cast type from the type-foundries, the similarities between founts became greater, but even then slight differences are nearly always observable. The founders were constantly revising their stock; punches would be touched up, matrices would be lost and replaced, new sorts would be added and old ones withdrawn, so that even founts of the same variety from the same founder could differ in minor detail. Besides this printers sometimes specified an abnormal body size or set for a particular face.

But above all it is the combination of different founts of type in a printer's stock, each one in a particular state of revision (or mixture of various states of revision) and wear, that identifies him. Add to this his stock of unique woodcut ornaments and initials (see pp. 154-6), and his finger-print is plain, a typographical equipment that belonged to him alone.<sup>36a</sup>

Only the largest printers of the sixteenth and seventeenth centuries were in a position to choose between one type design and another, the great majority of smaller printers being limited by shortage of capital to the output of one or perhaps two local foundries. By the eighteenth century alternative designs were becoming more widely available, but there is little evidence that ordinary printers cared much about the niceties of type design: what they wanted was a type that would not offend the conservatism of their customers, and one that was made of good hard-wearing metal. English printers enthusiastically exchanged their debased yet costly Dutch types for Caslon's urbane founts when they became available at very reasonable prices in the 1730s and 1740s; but when, a few years later, the typefounder Fry offered founts in Baskerville's eccentric design (which was well known to be bad for the eyes) he found few takers.<sup>37</sup>

<sup>36</sup> Carter, H., *A view of early typography*, Oxford 1969, pp. 57-8.

<sup>36a</sup> But not for all time; a printer's type, initials, ornaments, etc., might (like the rest of his equipment) be lent, pledged, sold, or seized.

<sup>37</sup> Reed, T. B., *A history of the old English letter foundries*, rev. Johnson, A. F., London 1952, pp. 300-1.