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PRINTING AT FROBEN'S: AN EYE-WITNESS ACCOUNT

by

JOHAN GERRITSEN *

IT is the purpose of this study to present and discuss the earliest account known to date of the process of printing books from movable types. The account in question is a letter written on the first of July, 1534, from Dulmen near Munster, by the Frisian scholar and statesman Wigle fen Aytta fen Swigchem (1507–1577), Viglius (ab Aytta) Zuichemus to give him his usual Latin style. It was addressed to a friend and fellow-Frisian, Dooitzen Wiarda, and is not known to have been preserved. But Viglius kept the draft, which eventually came, with the rest of his correspondence and his judicial and political commentaries, to the college he had founded at Louvain. There it disappeared, but a copy survived till 1794, and was then lost when the College had French troops quartered in it.

If Viglius had remained merely a scholar, that would have been that. But he lived to become a major statesman and to play an important role in the imperial politics of Charles V, and so the historian, and Archpriest of Malines, C. P. Hoynck van Papendrecht found his correspondence of sufficient interest to print a selection of over four hundred letters in his *Analecta Belgica*, published at The Hague in 1743. Our letter is number 52 in volume 2, part I, and the title placed over it claims that it accurately describes the whole business of printing, its tools and its workmen. Besides the letters, the *Analecta* printed various other of Viglius' papers including his autobiography and his will, but these contain nothing further relating to printing.¹

* The substance of this paper was read to the Bibliographical Society, London, on 15 December 1987. On a number of points it has benefited by the discussion with those then present.

1. The letter came to my notice through some queries relating to its meaning from a good friend and colleague, the historian E. H. Waterbolk, then quite unaware of the signal service he was thus doing to the history of printing. The status of the text is uncertain. It was in the last of a set of four folio volumes numbered V, VI, VII, VIII, of which only VI had a title. This stated that its contents were *descriptæ ex minutis per Feijonem Snecanum aº. 1560*; and the same may have held for the other three. How it came to Louvain is unknown; the Viglian College did at one time possess, through his bequest, folio volumes of drafts taken down from Viglius' dictation and generally checked and sometimes signed by him, but by 1743 many of these had already disappeared. The situation is fully described by Hoynck van Papendrecht, who gives evidence of having been a precise scholar (transcribing a MS title on *2v of vol. II.i, he refuses to expand but has the printer make shift to insert the marks of abbreviation of the original). The full (Latin) text of the letter is printed below as an appendix; there are no indications that it was manipulated in other respects than in the minutiae of presentation (such as the use of accents on some vowels).

To know Viglius' credentials to provide such a description we must look briefly at one or two elements from his early career. In August 1533 we find him leaving Padua, where he had lately been lecturing, to make for home after an absence of fourteen years, first as a student, then as a tutor, lecturer, and eventually professor at Louvain, Dole, Bourges and finally Padua. In 1532, while at Padua, he had discovered in the library of St Mark's in Venice an important Greek version of Justinian's *Institutes*, by Theophilus Antecessor. He had delivered a course of lectures on it, he had prepared an edition, and he had written a series of *Commentaries* on ten titles of the *Institutes*. Through the good offices of his friend Boniface Amerbach he had found the firm of Froben and Episcopius at Basel prepared to print these, and they acquired an imperial privilege for them dated October 1, 1533. The *Commentaries* carry a dedication to his friend and colleague from Louvain, now at Malines, Gerard Mulert, bearing that same date; the Theophilus carries a seventeen-page dedication to the Emperor Charles V dated May 31, 1533, that has become a classic in its field.

Viglius had sent the manuscript of the Theophilus ahead to Basel, but the *Commentaries* he brought along himself. Before coming to Basel he first visited Erasmus at Freiburg im Breisgau, but he must have arrived in Basel, with the manuscript, at some date in early November, for we have a letter to him from Erasmus, from Freiburg, dated on the eighth of that month. Replying early in December he reported that on his arrival he had found the Theophilus largely printed off, so that the emendations he had wanted to introduce from a second manuscript discovered and given to him by Baptista Egnatius had to go in an appendix. He added that he had given Froben the *Commentaries* to print, and that he was staying to assist Gelenius in correcting the proofs. According to the colophon the Theophilus was not completed till March (the *Commentaries* only give the year), but on January 7, 1534, Viglius returned to Freiburg.

In actual fact, when he arrived only sheets a-h of the Theophilus had been printed off: the heading to the emendations states that they have been incorporated except for the part already printed off, and the list ends with p. 96, i. e. signature h6^v. But though according to its colophon the book was not completed till March, and the *Commentaries* might therefore be thought to have been given precedence, Viglius was sending copies of the Theophilus to Bembo and Egnatius as early as 23 December.²

Viglius reached Friesland on March 12, and on May 4 he left again for Westphalia, where in the course of June he settled for a while at Dulmen. Thanks to the diligence of Hoyneck van Papendrecht we therefore have almost exact information on his movements, and we have his own testimony, in the letter, that he stayed with Froben at Basel for two months, and that he did so to correct his proofs. Even without this letter, merely from what we know of his movements we should have come to the same conclusion, and we may accordingly feel quite certain that he did indeed have two whole months at

2. Hoyneck van Papendrecht, I. i, 93-94.

Basel in which to find out from the inside how things were done at Froben's. We should therefore take what he has to report seriously. It was, moreover, not his first acquaintance with printing: in March, 1530, while studying under Alciati at Bourges, he had read proof for that scholar's *De Verborum Significatione*. Unfortunately, of course, he reports on what interests him, not on what interests us. What he relates is how it is done, but the technical details are beneath—or beyond—him. All the same the letter contains some significant material.

Viglius begins by recalling the circumstances that led to his writing the letter. For practical reasons I shall quote him mainly in English translation, but of course the Latin text is our primary source.³

The language aspect is not wholly unproblematic, and at one point, in fact, both German and Dutch will be invoked to make sense of what would otherwise seem extremely improbable in any language. Translation inevitably involves interpretation, and the hardest thing in trying to understand such a text is to avoid interpreting things into it. Therefore the body of the letter will be taken more or less paragraph by paragraph first, but some of the more problematic points will be set aside for discussion in the context of the whole, and some wider issues will be raised finally. To make the text more surveyable, some words and phrases have been capitalized as a guide.

Viglius begins by recalling to Wiarda how on his presenting him with a copy of the *Commentaries* the conversation turned to the art of printing, and how he had promised to supplement the description then given orally by an account in writing, i. e. the present letter.

We may be surprised that in 1534, roughly a century after the invention of the art, a gentleman of culture in Friesland should still require this information, but we should observe that, for all their reputation in early printing, the first printing press to be installed in the Netherlands North of Zwolle (an area including the whole of Friesland) was still half a century away.

What we should also observe is that Viglius presented Wiarda with a copy of the *Commentaries*. Not in itself surprising; but we should note the fact that it could be done at all. This is the book for which he carried the manuscript with him; and for him to be able to present Wiarda with a copy on getting home it must therefore have been completed in the two months he was at Basel. It is a 212-page folio, so totals fifty-three sheets, which implies a production rate of a sheet a day. Also, Viglius must have been at hand during its making from beginning to end. We do not, of course, know that proofs were not sent out to him, but what he has to say about the proofreading, as we shall see presently, ought to imply his attendance at the printing house for that purpose. This, in turn, implies a shop working to a fixed schedule.

But first the evidence. As on the earlier occasion, Viglius' plan is to discuss the printing process in terms of the functionaries engaged in it, in the

3. I am most grateful to my colleagues Drs L. J. Engels and B. L. Hijmans, both skilled in Renaissance Latin, for thorough help over my English rendering, as also to Dr F. Akkerman for his opinion on a further point. The ultimate responsibility naturally remains mine.

order in which they would be engaged on the production of a book, and then to give some details as required of their instruments.

First of all (he writes) there is at its head he whom we call the **TYPOGRAPHER**, who is now so called by us, not because in the better shops he should be accustomed to perform any of those tasks (whence originally the title was derived) but because he is the Master of the shop, and sees to its finances, pays all the other workmen hired by him their wages, and supervises them. For it is his major endeavour to search diligently for books that are worth printing and that are for sale, and for this end to earn the goodwill of learned men who might supply him with something of that nature. And although now the master printers perform hardly any other part of the work, it is yet probable that the first inventors of this art undertook and performed all parts. However, the size and number of the works and books to be printed has since effected that duties performed in the beginning by one and the same person were subsequently divided over many.

This should need little discussion. One might think that a printer would look for books that would sell, rather than for books that were for sale, but the Latin *venales* allows only the one interpretation, and saleability is possibly more or less implied in *prælo dignos*, worth printing. That it matters, we learn at the letter's end. In a situation like Froben's, where practically every one of his books carries an imperial privilege, and several a royal French one as well, the point would be that a book has to be available for publication in the first place. We may also note that, in another letter, Viglius relates with complete equanimity if not with some pride how at the end of that same year 1534, although the Theophilus is selling poorly, the *Commentaries* are already sold out and that Gryphius at Lyon is planning a new edition. The four years were not out, but the imperial privilege was the only one, and it did not run in France. Froben himself reprinted in 1542, and there were other reprints elsewhere. The point is perhaps also worth making that of the poorly selling Theophilus rather more copies seem to be about now than of the *Commentaries*.

Viglius continues:

Therefore, after the Typographer himself, they placed first of all the designer and **CUTTER OF** the actual **TYPES**. How great his importance is may easily be discerned by the fact that books printed in shapeless characters cost no less in labour and expense than those set in elegant type.

Accordingly the first thing the printer has to see to is to obtain the most elegant types possible, and particularly such as shall be able to satisfy not merely the sharp eye of youth but also the failing sight of advancing age. For letters that are too pointed offend the eye, but on the contrary those that are round and have been well designed, even when quite small, win the reader's approval. And from this skill Typography seems indeed first to have derived its origin.

As an account of the aesthetics of typography this is interesting, especially in its clear preference for roman over black letter. Needless to say, Froben's books by this time are generally in roman. But it should be equally clear that Viglius never saw anything of the punch-cutting and subsequent activities that eventually produce the matrices employed by the next workman discussed. The remark on the origins of typography, too, betrays no privileged knowledge, though he does single out the most essential element of the new art, the movable types.

He is assisted by the FOUNDER OF these same TYPES, who is among the first necessities in busy and well-equipped shops. For every day the types themselves decay, wear and break; and hence new ones must be substituted by the founder for those that are used up and thrown out. It is true, however, that his work is not such a necessary everyday requirement as that of the others of whom we shall speak hereafter, especially once a shop has been well equipped; nevertheless, just as they have supplied the instruments of the typographic art in the first place, so it is by them that these must be maintained, and as old types fail new ones must again be supplied in their stead.

It is again doubtful whether Viglius saw any typefounding done, but he makes it clear that it is a specialized job, and that in a well-furnished shop like Froben's it only takes place at intervals, a picture that accords well with what we find thirty years later in Plantin's records, where we see François Guyot and Laurens van Everbroeck visiting at intervals to cast type, apparently from matrices owned by Plantin and using matter bought by him.

With the next workman, however, we do at last seem to enter the realm of personal observation.

They are followed by him whom they call the COMPOSITOR, whose job it is to assemble together the types themselves, which are arranged in their boxes according to the alphabet, and to compose them into groups of characters according to the custom of writing; and when the job has been finished to loosen these same types again and to put them back and distribute them into their boxes. And it is almost this man's chief usefulness and praiseworthy diligence, to compose the types themselves not only fast, but accurately as well. For as in writing those are praised who quickly and correctly take in and set down what is dictated, so also this compositor's diligence merits no less a praise. Those, however, among them who perform a just task are accustomed to deliver about two formes daily; the more diligent ones, three; those who deliver four are reckoned among the most excellent; they, however, who deliver only one are deservedly branded with laziness. And indeed, if delay occurs here the work of all the other workmen suffers a hurtful delay. Accordingly printers are accustomed to look to it that the compositors in particular carry out their task diligently and complete their formes at regular intervals, by which these can once and again be placed under the press in order that thereby they may be produced

and printed more correctly and perfectly. In which their labour likewise is not small: for however careful they are, if they do not also have some erudition and judgment, they cause much work to the correctors, of whom we shall speak hereafter, and greatly hamper the other workmen and are of little use to their master printers.

The most remarkable statement here is that the lay of the case is alphabetical. It seems hazardous to dismiss such information out of hand: it is, after all, the earliest known statement on the matter, though on the other hand it is not very precise. It should be possible to keep the characters in alphabetical order and to vary merely the size of the boxes, but advancing this as an argument here would be playing devil's advocate, and not merely because of the carpentry that would be involved. Since the capitals at the top of the case are in fact in alphabetical order, unless one actually does some type-setting oneself, one may easily get the idea that the other characters would be the same. But we are also told that speed and accuracy of composition are valued, and they would undoubtedly demand an ergonomically justified arrangement capable of easy construction.

Another point we should dwell on for a moment is the comparison with scribal writing. Viglius takes it entirely for granted that scribal writing is done from dictation, a point that is interesting in its own right; but one may accordingly wonder whether he means to imply that composition is done the same way. It would then, however, be remarkable, given the avowed method of his description, that he makes no mention of a reader as a member of the team. It would thus seem that the point of the comparison is merely in the speed and accuracy of performance, and not in this external circumstance. The requirement of erudition in a compositor has only been dropped in our own day.

The PERFORMANCE DATA I propose to pass over for the moment: they deserve thorough discussion in the light of fuller information and will also require a look at the books themselves.

The letter continues:

This compositor, then, is followed by him whom we have called the CORRECTOR. This function is generally entrusted to some scholar, who reads over the composed formes with understanding and checks whether all types and letters are correctly joined together, and all words and paragraphs properly separated. But this duty the master printers themselves, if they have any learning, sometimes undertake. And this task Erasmus of Rotterdam himself (to whom the Frobenian Printing-house owes its first fame) did not scorn to undertake: as a result of which his works saw the light all the more correctly. The same solicitude has also kept me at Basel for two months while publishing my commentaries, in order that this first birth should be the more perfect. And yet at that time the responsibility for this task so far as all other works were concerned was in the hands of Sigismund Gelenius, a famous scholar, and worthy of far better things. And although

nearly all master PRINTERS STRIVE first of all AFTER PROFIT, unless they have a learned corrector of delicate taste, however elegant their types, and however much they applaud all else, yet they lose praise unless the corrector's care is apparent: for any student requires faultless books rather than handsome ones.

Before discussing this we should look at the next paragraph as well, without which the last one cannot be properly understood.

Working under the corrector there is he whom we call the READER. For COLLATION of the first printed forme WITH all THE EXEMPLAR is altogether necessary, and if it is to be done properly it requires two men's work. And in well-regulated shops it is customary for THREE PROOFS to be produced, and duly to be READ individually, by which faults and errors may be expurgated throughout.

We see a number of things here. First of all, there is a printer's reader whose job it is to collate the proof with the copy, and secondly there is a corrector. The corrector, we are told, must be a scholar and a man of taste; it is his task which Viglius apparently undertook for his own work instead of leaving it to Gelenius. About the qualifications required of the reader nothing is said, though we are told he works under the corrector. But we are also told that for the collation with the exemplar to be done properly, two men are needed, and the passage about the corrector is silent on the exemplar. This makes it likely that the proper interpretation of the passage about the reader is that the collation of proof with copy is done in the way that has always been accounted best, the reader reading out the exemplar aloud and the corrector checking the proof. Especially when done several times over (as personal experience has shown), it is the safest way there is.

This interpretation would also make sense of the often quoted passage from Zeltner, 1716, if we assume that Zeltner mistook the successive reading of three or four proofs for the simultaneous reading aloud of the text for three or four sheets. It is quite true that, as he observes, a reader's steady tempo would make it hard for the compositor to waste time in rêverie, but one may well doubt the efficiency of composition in a shop where three or four sheets were being read out simultaneously *sonora voce*, in a resounding or ringing voice, rather than, as Dr Gaskell translates, a *clear* one.⁴

If that (orthodox) interpretation of the reader's job is allowed, it follows that the three proofs next mentioned belong to successive stages of correction, i. e. mean proof and two revises. The three proofs are to be read individually, which should mean read completely, not merely checked for correction of what had been marked, but as we are told that collation with the exemplar is necessary for the *first* forme we may think that the process was repeated

4. *A New Introduction to Bibliography*, 1972, 49, note 32. The last sentence of the Latin needs no *sic*. The method appealed to Zeltner because it imposed a set speed and eliminated daydreaming.

reading the last corrected proof or revise aloud. We also find confirmed that it is the corrector's responsibility to watch over style, typographical probably as well as linguistic, if not literary. Another corollary of what we are told must be discussed when we return to the compositor.

Attention should also be drawn to two incidental remarks: nearly all master printers, we are told, strive first of all after profit, and the pulling of three proofs is customary in well-regulated printing-houses. In other words, to stay in business a printer must first of all be a hard-headed businessman, and secondly and no less importantly he must get his business properly organized. The remark is also characteristic of Viglius, whose own career as a statesman was based on corresponding principles.

Let us follow him to the next stage of the printing process.

And after this the PRESSMEN are free to print. One of them moistens the balls with ink and in turn strikes them together, by which the ink shall spread over them more conveniently; and with them he then wets the types all over; the other, however, puts the PREPARED PAPER under the press and then works the press itself, and the printed sheets having been taken off again puts new paper under. The paper cannot, however, be PRINTED except ON ONE SIDE of the sheet on a single day, BECAUSE IT MUST FIRST BE DRIED lest the ink runs and in order that it shall take the impression on the other side the more conveniently. For this reason some drying substances are even added to the ink, by which the printed sheets can more easily retain the fluid. For unless they have been well dried the printed letter-forms may easily disappear by beating when they are BOUND.

This presents the well-known picture of the two pressmen and their division of labour, but it does not give us much of an idea of the actual process. The matter of the drying, too, is ambiguous. Here again, it is wise to let matters rest for a moment, until we shall have all the relevant information that the letter contains. Its next sentence underlines this, but more is to come.

Last of all, to be sure, there is need for a FOLDER, whose duty it is to dry the printed sheets, next to fold them, and thereafter to arrange them in two's, three's or fours, as we now say; and then to collect those again into a complete volume and copy AS THEY ARE SOLD; the formes themselves, too, when the number to be printed is complete, and before the types are distributed again into their compartments, he must carefully RINSE, lest any black and viscous liquid sticks to the types, and (when new FORMES are to be prepared) they can for that reason, even when loosened, less easily be composed again; in addition he must WET the BALLS AND the PAPER, in order that it shall more easily receive the impressed letters, by means of some interposed DAMPENED LINEN CLOTHS, and also see to it that the INK is properly MADE. In performing these duties, though, the pressmen themselves sometimes take a part.

Whether the pressmen take a hand or no, this last of the printing-house operatives has a complicated job. He must fold the sheets, but we are not told unambiguously whether this means just doubling them up or folding them to their final format. (Viglius may not have seen any books below folio format printed or gathered; both his own were folios. Cf. the discussion of formes below.) Next he must quire them, and then he must gather the quires into complete copies, 'as they are sold'. I am not aware of instances from this period, but cases seen or reported from the next century invariably have been folded to the correct format (though not necessarily quired correctly). For folios, which is what the majority of Froben publications are, it does of course come to the same thing. But the quiring before gathering is interesting.

What is also interesting is the addition of 'as they are sold', which very clearly does not envisage binding or in fact any form of provisional sewing (such as was common at least in the eighteenth century). It also, like the whole account, implies a printer who is his own publisher and does not normally work for others.

Further, he must rinse the formes prior to distribution by the compositor, and he must dampen both the balls and the paper before printing, using dampened linen cloths for the purpose. There is no mention of urine for the balls. Finally, he must make the ink.

After the workmen, the instruments.

The principal tools of the printing house, however are the types, paper, ink, balls and press.

About the TYPES nothing further need be said.

As to the PAPER it is unnecessary to explain how it is made from bruised and softened linen cloths. It is usually distinguished into sheets, quires, reams and bales, to use vulgar words where Latin ones are wanting. The bale, then, contains ten reams, the ream twenty quires, the quire again twenty-five sheets. When, however, a formless bale of paper sells for five florins, when the print has been added it is usually estimated at nearly twenty.

The 500-sheet ream is hardly remarkable for this area, but it is pleasant to have the ten-ream bale as well. The final statement will draw some present comment. A surprise is, however, in store for us with the next statement.

The INK, however, of books and printers is not much different from writing ink, which is principally made of linseed oil and resin.

For printing ink the recipe is adequate enough (though the pigment is missing) but it produces what is known as 'varnish' and thus the statement about writing ink is disturbing, the more so as Plantin in 1567 clearly says that the

two are not to be compared.⁵ Did Viglius, as he wrote the letter, really think he was dipping his pen in linseed oil and resin?

The BALLS have a semicircular shape and consist of skin stuffed with hair. Because it easily wears it must frequently be changed.

This misses out the wooden base and handle, but is otherwise adequate. The translation, however, calls for a defence. The balls, Viglius says, *constant folio pilis suffulto*, and a *folium* is first of all a leaf, then a sheet of paper or parchment, then a number of other more specialized things, but never so far as I can find is it skin. Yet skin is what we have come to expect here, and though we must reckon with the possibility that in the early days things were done differently, none of the meanings of *folium* denotes a substance that could conceivably be of any use for inking. We should remember that it is wetted, too. For an explanation we must, I suggest, turn to Viglius' linguistic background, and we must assume that, habitually, he did not think in Frisian but in Dutch. Viglius scholars consulted, though they can give no certain enlightenment on this point, do not object. Viglius learnt, and for that matter also wrote, about printing, in what today at any rate we would term a German-speaking area. Now the German word for animal skin is *Fell*, a word that, as *vel*, *fel* also exists in Dutch and in Frisian. But the Dutch *vel*, unlike its German and Frisian cognates, can equate with *folium*, as in addition to the common *skin* sense it can denote a sheet: of paper, parchment, &c. We would have here, then, an extreme example of the well-known phenomenon that every vernacular has its own Later Latin.

The next statement is perhaps the most startling in the whole letter:

The PRESS has nothing special that merits explaining.

It seems plain that by this time the press could hardly have been much simpler than what we know from the early cuts, and in fact may not have differed much from what we find in the earliest first-hand drawing, Saenredam's of 1628.⁶

What Viglius' statement therefore ought to mean is: the press is like those presses that you know from your own everyday experience. In Friesland, oil and linen presses, if not wine presses, should at least have been known: they give the screw principle but hardly the hose &c. The basic mechanism of the

5. *La Première et la Seconde Partie des Dialogues François pour les Jeunes Enfants*, section *L'Imprimerie*: 'Je laisse ce que nous auons de commun avec l'écriuain, comme le papier & l'encre, encore que nostre encre soit semblable à la sienne.'—'Quelle difference y a-il?'—'La difference est, que la nostre est faite de tormentine, huile, & fumée: aussi est-il necessaire qu'elle le soit.'

6. Reproduced by J. W. Enschedé, 'De drukpersafbeeldingen in Ampzing en Scriverius 1628', *Tijdschrift voor Boek- en Bibliotheekwezen*, 6 (1908) 265–268. This sequel to his substantial study of two years earlier in the same journal was unfortunately missed by Dr Gaskell. To the reference in his *New Introduction*, p. 123, note 3, should also be added pp. 262–277.

carriage was known from such instruments as the mangle; but this too is far from the whole story. Rather, the purely mechanical aspects of the technology would not seem to have interested Viglius, an observation that can be made at various other points in his account.

The WAGES as well of pressmen and compositors as of other workmen of the printing house vary according to the conditions of the times and places and quality of the men.

We could have guessed.

This, my Dooitzen, is what I had to impart to you, &c.

With the full information contained in the letter now available, we can turn back to the points left out of the discussion so far. The principal of these are the performance data. According to Viglius, two formes a day is the norm, three is good, four is superb. Distribution is done by the compositor himself. Let us relate this to his own books. The *Theophilus* is something under 1,000 ems of Greek per page, the Latin *Commentaries* about half as much again, both without the side-notes. They are both folios, so the normal double-page forme would contain twice this amount of type, up to 3,000 ems without the sidenotes. This would give a daily production of over 6,000 ems (two formes) as the norm, over 12,000 (four formes) for a superb compositor. Moreover we are speaking of the delivery of formes, not of the rate of type-setting so that, assuming our superb compositor to be able to distribute at a rate commensurate with his type-setting prowess, he would have to set at the rate of about 16,000 ems per day, 1,300 to 1,600 ems per hour, depending on the length of his working day.

Let us now confront this with known data from the period. Beginning in October 1563, Plantin's best compositor, Cornelis de Molenaer, is on record for a great many years. Though the records are often insufficiently specific, his average rate can accordingly be calculated over fairly long periods, and then may reach about 5000 ems per day, as a rule in a rather smaller letter than in the *Theophilus* with its 20-line measurement of 109 millimetres (roughly *texte* or great primer) and one that would mostly have been faster to set. In a twelve-hour working day, with make-up and so forth done in the workman's own time but distribution in the boss's, that would mean about 550 ems per hour of actual setting.

For the 1565 Nonius Marcellus, set in *mediane* (roughly pica), Jan Strien set 25 formes in five weeks, a weekly average of 22,440 ems, just over 400 ems per hour, without the *gaillarde* side-notes. His colleague Gosuin Gouberi set 39 formes of the same book in eight weeks, which amounts to still less. Adding the work on the side-notes we get near to Cornelis' average.

These figures are of the same order of magnitude as those assembled by Dr Gaskell from the records of the Cambridge University Press, and we are thus almost inevitably led to the conclusion that the *forma* here must be the

single folio page. This then naturally prompts the question whether that does also mean single-page formes, with single-pull printing on folded sheets such as we know from the early days of printing.

Haebler states that till c. 1470 the greater number of incunables were printed page by page, and that the representations of the press show that this practice could have continued till the end of the period, though that is no proof that it did so happen. Dr Needham states that 'By the mid-1470's, when setting and printing by formes on the two-pull press began to become common, conspicuously awkward textual joins, the result of carelessness and inaccurate casting off of copy, can easily enough be found' and cites Haebler (who does not, however, view the matter in quite that way).⁷

Tests for the method used are not hard to find: differential inking; identical material in forme-mates; incorrect alignment of forme-mates; differential perfecting of forme-mates; printing on folded paper evidenced by blind impression in forme-mate; red shift; and (just possibly) wrong impositions. They are not hard to imagine, but often quite hard to use. The problem is that most of the tests depend on things going wrong, and that responsible printers may therefore discard what could be evidence before it ever gets into a volume. Besides, some of the phenomena described are unlikely to show up in the average incunable. One is not surprised to find single-pull in a Koberger folio of 1477 so big that no other method could then have produced it; or to find it in the work of small men like the printers of the Delft Bible of the same year or like Jacob Bellaert at Haarlem as late as the eighties. But for a big firm like Froben's to have used it still in 1534 would be extremely surprising. It is therefore fortunate that it can be proved that in 1500, at least, Johann Amerbach and Johann Froben de Hammelburg used two-pull printing for their quarto *Decretum Gratiani* of that year. Printed in red and black, it has enough identical red shift in the two halves of the sheet to prove that these must have been printed together in one forme.

The point is emphasized because of the conclusion that the letter ought not here to be accepted at its face value. The word *forma* occurs seven times, all but one in the plural, but not all with the same reference. In four it is clearly the forme of type delivered by the compositors, in the other three it is as clearly the proof pulled from this by the pressmen. Viglius' *forma* cannot be the full, two-pull forme, but we can also rule out that Froben still practised single-pull printing. Where is the way out? It may lie in a well-known linguistic phenomenon, language lagging behind external reality. We have long been accustomed to green, and are even accustoming ourselves to white blackboards. 'Whiteboard' now seems to be gaining currency for the latter, 'greenboard' appears to have remained largely a dictionary word. The printer's forme, as it came into existence in the early days of printing, was the single

7. Konrad Haebler, *Handbuch der Inkunabelkunde* (1925), 65–67, 76–78; Paul Needham, 'Division of Copy in the Gutenberg Bible: Three Glosses on the Ink Evidence', *PBSA* 79 (1985), 411–426, p. 426.

folio page, printed at a single pull on a folded sheet. Plainly this is the sense in which Viglius uses the word, and he must be doing so because he has heard it used that way.⁸ But equally plainly technology has advanced, and two of these 'formes' are now printed within a single chase, at two pulls. But that is technology, and of no interest to Viglius. The press has nothing special that merits explaining.

Another remark that should be dwelt upon further is what we are told about the compositors' key position in the shop. They in particular must

carry out their task diligently and complete their formes at regular intervals;

if they do not,

the work of all the other workmen suffers a hurtful delay;

and also if they have not sufficient erudition

they cause much work to the correctors . . . , and greatly hamper the other workmen.

What all this refers to is that unless the compositor works to schedule, the men coming after him stand to lose. They will have to be idle, and for the pressmen at least that means loss of income. This tallies precisely with what we see at another well-regulated establishment, Plantin's, where there is a system of fines for those causing delay, so as to reimburse those who suffer by it. Thus we see how the compositor composing the wrong forme has to reimburse the pressmen, the pressmen who deliver the wrought-off forme too late for distribution must reimburse the compositors. It is a good shop, so it does not happen often, but it happens, and gets recorded. And those who cannot meet its standards, such as Benedict Wertlaw, who beat too fat, are forced to leave while still owing five stivers for beer.⁹

There is no reason to quarrel with Professor McKenzie over what happened at the Cambridge University Press in the eighteenth century but, as I have suggested in print before, and as has been stated more recently by Dr Needham, the eighteenth century is no strict evidence for the seventeenth or earlier centuries any more than these earlier centuries are for the eighteenth. We have to work with generalizations, but they need not be the same for all times, and they must not be applied to specific cases without checking that they apply. A further instance will appear presently.

There may well have been (indeed, there probably were) printers who were proud of muddling through; there certainly were printers who stuck to fixed schedules. But workmen may fall ill, or may go on the tiles, equipment

8. It is evident that Viglius never considers formats below folio.

9. The precise fault quoted here is interpretation. Plantin was dissatisfied with his work and told him so. He claimed the paper was insufficiently sized, so Plantin gave him good Troyes paper, with which he could do no better. He lasted almost four months in 1564, having started up the third press. (Antwerp, Museum Plantin-Moretus, MS 31, *Journal des Ouvriers* 1563-74, fol. 3v.)

may break down, even in the best regulated shops. The smaller the shop, the more it hurts. Even at Plantin's one cannot be certain how things went on when, after the first few years, full records were no longer needed, and so were not kept, though such evidence as has been examined suggests that, if methods changed, method remained. But it is important to realize that this is then only a working hypothesis.

If the account so far is accepted, a problem attaches to the proofreading. This has to be done against the exemplar, which is reasonably simple if composition is continuous, but must also have been feasible when it was by formes (which such evidence as has been gathered suggests was the case with Viglius' *Commentaries*). When can the proofreading have been done? It is a fairly slow job, and it can mean more than merely checking the proofs: restarting in 1563 Plantin buys four thesauruses, seven dictionaries, two biblical concordances, a Latin Bible, and a Greek New Testament, to the tune of some sixty florins, 'pour le service de la correction'. Later, he buys more. Moreover, the corrector will have to deal with a number of compositors: in 1563 Plantin engaged Matthijs Ghisbrechts to correct the work of six men, all six of them setting by formes. What if they all produced their proofs and revises at the same time?

The answer could lie in an aspect of the matter that generally seems not to have had sufficient attention. Of course compositors are not composing the whole day; they are also distributing, dressing formes, etc. This could provide part of the answer. But there is something else. There has been repeated mention of a twelve-hour day, and that may have been correct for the Continent, though for England it may have been too long. But the twelve hours are not a solid block, any more than our present eight-or-fewer-hour day is: they are punctuated by what we would now call coffee, lunch and tea breaks, amounting to up to two and a half hours in England, and on the Continent perhaps even more. All in all this means that there are on average four or five hours every day when the compositor will not need the copy. It should also be added that when the working day starts (at five or six a.m.) the compositors start composing and the pressmen printing: any preparations needed have been made in their own time. There is a clear illustration in the later Plantin records, when the pressmen complain about the new doorman, who will not let them in early enough. Especially when printing in red and black they do not have enough time to start printing at six, when their working day starts.

In this sort of situation it makes no difference whether setting is continuous or by formes. Setting by formes must necessarily have been the earliest method, and printing house routine will accordingly have been based on it. With the full forme it can still be found throughout the seventeenth century, though it is hard to tell when it stopped. Dr Gaskell's statement that Plantin changed to continuous setting around 1565 rests on a misunderstanding.¹⁰

10. *New Introduction*, 42 and note 9; the reference must be to II, 303, where Dr Voet deals with this matter. Dr Gaskell then only knew his book in proof. A fuller discussion of

Dr Voet, whom he cites, merely states that Plantin then went over to having a book set by a single compositor instead of two, and even that is only a general but not a particular truth. But when he uses two compositors on a single book, each now usually (not invariably) has full sheets to set. When Plantin changed over to continuous setting I do not know, for I have no useful records beyond 1570, but at that date setting by formes was still there, and it is a fairly logical way of dealing with printed copy.

The next statement to return to is the one about selling price as a factor of paper price:

When, however, a formless bale of paper sells for five florins, when the print has been added it is usually estimated at nearly twenty.

Plantin buys paper for the 1564 Virgil at 26 stivers/ream, for the Sambucus Horace at 23½ stivers/ream. On 26 February 1564 he sells 500 of either to Arnold Brickman & Co at the Fat Hen for 3 florins (sixty stivers) a ream. That is less than three times the cost of paper, but of course when the book reaches the retail customer it will cost more. Shortly after, on 5 March, he sells two copies of the Virgil at 3½ stivers each. The book is 19½ sheets, in an edition of 2500 copies; the paper used, with waste and proofs, was 101 reams. This amounts to a paper cost per copy of just over 1 stiver, so a retail price almost 3½ times the paper cost, not so far from what Viglius states, and again the sale is not to the ultimate user. The total cost per copy, incidentally, which Plantin works out correctly, is one and a half stivers.

He also sells two copies of the Horace at 3 stivers. This was 11 sheets in an edition of 1250, using 28 reams, so costing just over ½ stiver in paper, seven-eighths of a stiver in all, per copy to produce. This agrees precisely with Viglius. Of the very comparable Lucan (11½ sheets, 29½ reams, 1250 copies) Brickman buys 300 at again 3 florins a ream, and of this, too, two copies are sold at 2 stivers each. These are some of the earliest books for which we have records, and they are sold in Antwerp, thirty years after the letter. But they do bear out Viglius' words as a general statement.

Perhaps the most important point in the letter still remains, viz the matter of casting off:

The paper cannot, however, be PRINTED except ON ONE SIDE of the sheet on a single day, BECAUSE IT MUST FIRST BE DRIED lest the ink runs and in order that it shall take the impression on the other side the more conveniently. For this reason some drying substances are even added to the ink, by which the printed sheets can more easily retain the fluid. For unless they have been well dried the printed letter-forms may easily disappear by beating when they are BOUND.

this and some related points is in my 'Plantin aan het werk—Het tweede begin,' *Het oude en het nieuwe boek, De oude en de nieuwe bibliotheek: Liber Amicorum H. D. Veruliet, Kapellen* (1988), 115–127.

We have here the only reference to binding, but that is not its main point, which is rather the statement that, because of the condition of the ink, only one side of the paper can be printed on a single day. Viglius is quite emphatic that it is because of the ink, and his mention of the addition of drying substances adds to his credibility here. But it is not so clear what he means by the disappearance of the ink during binding, a process of which this is the only mention. We may also note that quite soon after his 1563 restart, Plantin, who did not then do any binding himself, but who employed numerous binders to bind sufficient numbers of his books to suggest that they were bound on spec and not on commission, bought a big press for pressing unbound books. And why should the dried sheet take the impression on the other side the more conveniently? Is the problem offsetting? For it is a fact that in many early books partial offsets of the same or (sometimes) another sheet are frequently to be found. And should it then be necessary to wet the paper again for perfecting? For to take the ink properly a damp paper is required, and we are in fact told that drying the paper is the folder's duty. One thing seems certain: if for the normal book at least half a day had to pass before a sheet could be perfected, there would be every point in setting by formes.

Since Viglius is not more specific, answers to the questions just put must be tentative, but some observations can be made. The drying of the ink involves two processes, oxydation of the varnish and absorption by the paper, which must be balanced to make the pigment stick. If absorption is faster than oxydation, the pigment is no longer protected by the varnish, and may rub off. To avoid this a strong varnish is needed, but the problem is that the lampblack with which it is mixed considerably weakens the varnish.¹¹ It is therefore essential to ensure that the ink has dried properly before perfecting, and again before gathering.

To show that early printing and perfecting did in fact not take place on the same day proved more difficult. What is needed is a book that will allow of proper type and/or headline analysis (preferably both), and this is not easy to find when the quality of printing is high and headlines are frequently absent. Only a single case can be reported so far, viz *Die Cronycke van Hollandt Zeelandt ende Vrieslant* printed by Jan Seversz at Leiden in 1517. This is a fat folio of 284 formes, all but a few with headlines, set by two compositors from two different main fonts that were both sufficiently worn to make type analysis (just) possible. The quiring is a curious mixture of sixes and fours, and the division of labour between the two compositors (who each set full sheets) is equally curious, but both the headlines and the types make it evident that practice (for a run of sixes) was as follows.

The first forme through the press was the outer forme of the outer sheet, which was followed by the outer forme of the middle sheet. Next these two sheets were perfected in the same order, after which came the outer formes of the inner sheet and of the outer sheet of the next quire. These were then

11. Brugman, J. M., *Drukinkten in de praktijk*, Amsterdam (1951), 14–15.

similarly perfected, the middle and inner sheet of the second quire followed in the same way, after which the process started all over again.¹²

That Froben worked in precisely this way cannot be proved, but it is evident from what Viglius wrote that some such system must have been in operation, and the pattern of recurrence of the four-line ornamental E's, a fairly frequent feature in the *Theophilus*, suggests that it was not too dissimilar. It would seem to be a system that nobody would use who did not have to, but given the problem of the ink it is the most efficient way of meeting that.

To sum up: although the letter is the earliest document presently known on the subject, the art of printing with movable types was almost a century old when it was written. The technical information it supplies is severely limited; the process it describes is basically the process as we know it from later evidence, but the manner of proceeding partly differs. Of the prototypography it can tell us nothing: the few historical remarks it contains are clearly inferential. In its use of the word *forma*, however, it seems to retain an echo of an earlier state of affairs, when the 'forme' was coextensive with the imposed folio page. Just how long that state persisted in different places is not perhaps as evident as has been suggested; but it is probably only one reason why, as it would appear, composition long (but not exclusively) continued by formes. It would need further research into the composition of the inks to determine a date when perfecting and printing *might* have fallen on the same day, but it is doubtful if after four or five centuries the evidence remains. The main advantages of consecutive setting appear in setting prose from manuscript, and it may well be that it was first confined to this. But when the manuscript given to the compositor was a regularly written scribal copy, for which Plantin again provides early evidence, even this advantage was not considerable.

In its concentration on the workmen and the principal tools the letter gives us a precise listing of the functions in the shop and their distribution over individuals, though in the case of the compositors and pressmen it gives no numbers. There is clearly but one master, and one corrector with his reader; probably only one folder, considering the number of different tasks he is assigned. The reader is met here for the first time, and is part of the job Viglius specifically stayed in Basel for. How general his role was we cannot tell; there is no evidence for it at Plantin's.

Of the tools it is a pity more is not said.

APPENDIX

EPISTOLA LII.

DOTHIE WYARDÆ.

Omnem artis typographiæ rationem instrumentorum, operariorumque, accuratè describit.

Quum peracto studiorum meorum curriculo in Patriam reversum, multa (uti fieri solet) tum parentes ac propinqui inter quos te, mi *Dotia*, facile mei amantissimum

12. See my "Jan Severz prints a Chronicle," *Quærendo*, 21 (1991), forthcoming.

sum expertus, de anteactæ vitæ studiis, iisque rebus, quarum aliquam cognitionem longa experientia ac annorum quatuordecim continua absentia comparavissem, curiosè interrogaretis: ac tandem forte mentio incidisset artis Typographicæ, occasione nata ab exemplari commentariorum meorum in aliquot Institutionum *Justiniani* titulos, quos in meo ex Italia reditu Basileæ *Frobenianæ* officinæ imprimendos tradideram, tibi que velut militiæ meæ tesseram dono obtuleram; non satis tunc tibi facere potui exponendo ea quæ ibidem observaram, nisi eadem quoque scripto me explicaturum reciperem. Et quanquam non ea cura singula notaram, ut de ipsis aliquid litteris me posse tradere considerem (quippe qui obiter, & quasi per transennam dumtaxat quæ in ea officina gerebantur conspexeram) extorsit tamen hoc ab mea verecundia tua auctoritas, dum nihil tibi denegare ausus fui, ut ut plus promiserim, quàm præstando solvendoque essem. Et lubenter quidem silentio hanc obligationem dissimulassem, nisi tua tam crebra appellatio, me tandem calamum in manum assumere compulisset: fidem quidem lubenter impleturus, quatenus videlicet se mea extendi memoria. In quo si quid desiderabis, tibi imputa, qui a me potius, quàm a peritioribus ista cognoscere volueris. Sequar autem ordinem quem tunc tenebam singulosque officinæ Typographicæ ministros paucis recensebo.

Inprimis ei præest is quem Typographum nominamus, qui sic nunc a nobis vocatur, non quod ipse aliquid earum operarum in celebrioribus officinis soleat subire (unde principio nomen desumptum est) sed quod officinæ Magister sit, sumptusque subministret, cæterisque operariis omnibus a se conductis mercedem exolvat, eisque superintendat. Nam hujus præcipuum est studium, ut libros prælo dignos venalesque conquirit, atque in id doctorum virorum, qui ejusmodi aliquid suppeditare ei possint, gratiam sibi comparet. Et quanquam nunc primarii Typographi nihil fere præterea operæ præstent, primos tamen ejus artis inventores, omnes partes subiisse explevisseque verisimile est. Verùm operum librorumque imprimendorum magnitudo, multitudoque deinceps effecit, ut munia ab uno eodemque principio tractata in plures deinde dividerentur.

Igitur post ipsum Typographum proximo loco ponebant eum, qui ipsos litterarum typos effingit, sculpsitque. Cujus quanta sit præstantia, ex eo dijudicari facile potest, quod non minus laboris sumptusque libri deformibus, atque alii bene elegantibus, characteribus impressi, consent. Proinde id inprimis Typographo studio esse debet, ut typos quàm elegantissimos conquirit, ac tales præsertim, qui non solum adolescentium perspicacitati; verum etiam senescentium labentibus oculis queant satisfacere. Nimium enim acutæ litteræ oculos offendunt, ac contra quæ rotundæ apteque concinnatæ sunt, etiamsi minutiores sint, lectori applaudunt. Et ab hoc quidem artificio, Typographia principio originem duxisse videtur.

Cui adminiculatur eorumdem typorum fusor, qui operosis locupletibusque officinis cùm primis est necessarius. Quotidie enim ipsi typi litterarii labascunt, atteruntur, confringunturque: unde in consumptorum rejectorumque locum, novi per fusorem substituendi sunt. Verùm licet ejus non ita necessaria, quotidianaque, ut cæterorum de quibus postea dicemus, est opera, præsertim in officina semel bene instructa: attamen ut illi primi Impressoriæ artis instrumenta subministrarunt, ita per eosdem retinenda, & veteribus deficientibus typis in eorum locum novi rursus sufficiendi sunt.

Hos sequitur is quem Compositorem vocant, cujus officium est typos ipsos litterarios per loculos suos ordine juxta Alphabetum collocatos, secundum materiam subjectam libri, operisque imprimendi, in unum componere, & in syllabas juxta scribendi consuetudinem colligere, opereque completo rursus postea eosdem typos dissolvere, inque suos loculos reponere, distribuereque. Et hujus quidem fere præcipuus est usus, commendabilisque industria, non solummodò ut cito, verùm etiam emendate typos ipsos componat. Uti enim in scribendo ii laudantur, qui & celeriter & correcte dictata recipiunt, describuntque: sic & hujus Compositoris diligentia, non minorem laudem meretur. Qui justam autem inter hos operam implent, solent fere duas formas quotidie exhibere: diligentiores, tres: qui quatuor, hi cum primis præstantes habentur: qui verò unam dumtaxat, ignaviæ meritò notantur. Atque hic

quidem si cessatum fuerit, cæterarum omnium operarum labor damnosam patitur remoram. Itaque in hoc Typographi vigilare solent, ut ipsi Compositores suum officium diligenter expleant, formasque tempestivè absolvant, quò semel iterumque prelo subjici, ac sic correctius emendatiusque exire, ac imprimi queant. In quo itidem non parva eorum est opera: etenim quantumvis sint diligentes, nisi quoque aliquid eruditionis, iudicii que habeant, Correctoribus de quibus postea dicemus, multum negotii facessunt, & cæteris operariis magnum impedimentum adferunt Typographisque officinæ Magistris parum sunt utiles.

Huic autem Compositori succedit is quem Correctorem vocavimus. Quod officium docto alicui viro fere committi solet, qui cum iudicio formas compositas relegat, recenseatque num recte omnes typi litteræque sint conjunctæ, syllabæque ac orationes distinctæ. Ac hoc etiam officii ipsimet Typographi, si quid litterarum tenent, sibi nonnunquam assumere solent. Et hanc quidem operam ipse *Erasmus* Roterodamus (cui *Frobeniana* Typographia celebritatem primam debet) subire non gravabatur: quo opera sua eo emendatius in lucem exirent. Eadem sollicitudo & me in commentariis meis edendis menses duos Basileæ detenuit, ut prima fœtura emendatior prodiret. Quanquam eo tempore hoc officii præstabat in cæteris operibus, quæ in eadem officina imprimebantur, *Sigismundus Gelenius*, vir insigniter doctus, & longe meliore fortuna dignus. Et cum ipsi Typographi quæstum ferè omnes imprimis secentur: nisi doctum emunctæque naris Correctorem habeant, quantumvis elegantes sint typi, cæteraque omnia applaudant: laudem tamen amittunt, nisi Correctorum diligentia appareat: cum quilibet Studiosus libros magis emendatos, quàm elegantes requirat.

Correctori autem subservit is quem Lectorem vocant. Collatio enim primæ formæ impressæ cum exemplari, omnino necessaria est: & ut rectè fiat, duorum operam requirit. Solentque in bene institutis officinis tres confici formæ, ordineque singulæ relegi, quo omni ex partè mendæ vitiaque expurgentur.

Ac deinde Impressoribus libera imprimendi fit potestas. Ex quibus unus pilas atramento irrigat, easque invicem collidit, quo se atramentum commodius in eas dispergat: quibus deinde typos undique tingit: alter verò chartas ad id paratas prelo imponit, ipsumque deinde prelum subigit, ac sublatiis impressis, novas iterum subjicit. Non possunt autem nisi in unum folii latus uno die chartæ imprimi quod prius exiccandæ sint, ne atramentum diffluat, & ut alterius lateris impressionem commodius suscipiant. Ideoque etiam siccativæ quædam materiæ atramento adduntur, quo impressa folia liquorem facilius retineant. Nam nisi bene siccata fuerint, tum quoque cum religandæ sunt, impressæ litterarum figuræ pulsatione facile evanescent.

Novissime verò Complicatore quoque aliquo opus est, cujus est officium impressas chartas exiccare, deinde complicare, ac postea in duerniones, terniones, quaternionesve (uti nunc loquimur) digerere: ac deinde eosdem in integrum volumen, ac exemplum quemadmodum vendi solent, colligere: formas quoque ipsas ubi numerus imprimendorum completus est, & antequam typi rursus in suos disponantur loculos, diligenter lavare, ne ater viscosusque liquor typis adhæreat, ac minùs commodè idcirco vel dissolutæ rursus (dum novæ conficiendæ sunt formæ) componi queant: adhæc etiam pilas papyrumque, quo facilius litteras impressas recipiat, interpositis quibusdam humectantibus linteolis madefacere, atque atramentum rite confici curare. In quibus tamen operis præstandis partem aliquam ipsi quoque impressores nonnumquam subeunt.

Potissima autem officinæ instrumenta sunt typi, papyrus, atramentum, pilæ, & prelum.

De typis nihil est opus amplius dicere.

Papyrus autem quomodo ex contritus commolitisque linteolis fiat, explicare non est opus. Hæc autem per folia, arcus, risas, ac balas, ut vulgaribus utar vocabulis (quando Latina deficiunt) distinguere solet. Continet autem bala risas decem: risa arcus viginti: arcus rursus folia viginti quinquæ. Cum autem bala papyri informis quinque florenis vendatur, ubi impressio accessit, viginti ferè æstimari solet.

Atramentum autem hoc librarium impressoriumque non multum a scriptorio differt, quod potissimum ex lini oleo glessoque conficitur.

Pilæ autem hemicycli formam habent, constantque folio pilis suffulto. Quod quia facile conteritur, mutare subinde necesse est.

Prelum autem nihil habet speciale, quod explicari mereatur.

Mercedes cum Impressorum Compositorumque tum aliorum officinæ ministrorum pro temporum locorum hominumque qualitate variant.

Hæc, mi *Dothia*, habui quæ tibi impertirem, ex quibus nonnulla forte obscuriora tibi videbuntur, quàm, ut ex hac descriptione mea plenè queas intelligere. Verùm si penitius hanc artem cognoscere desiderabis, propriis ea tibi erunt perlustranda oculis: & mihi veniam dabis, qui hæc te compellente, qualitercumque explicare nisus sum. Bene vale Consobrine cumprimis charè. Datum Dulmaniz. Calendis Juliis 1534.

TERMINOLOGY

As the subject has recently come in for a certain amount of attention, it may be useful to review briefly the terminology employed in the letter. It is mostly simple and unambiguous; there are only a few cases where different terms are used with apparently the same reference. The art of printing itself is variously *ars typographica*, *impressoria ars*, *typographia*, and the verb is *imprimere*. Paper is both *charta* and *papyrus*, but there is perhaps a distinction, *charta* being restricted to the sheets and *papyrus* being used more generally for the substance. It comes in *folia*, *arcus*, *risas et balas*, sheets, quires, reams and bales. It is made from *linetolum*, linen cloth, and the same material is also used as an interlay in the process of damping the heap. The printing house seems to be both *officina typographica* and (*Frobeniana*) *Typographia*, though in view of the use of *typographia* in the sense of *ars typographica* mentioned above, one might perhaps take it in that sense here. In two cases the term employed is the same as the present-day English one: *compositor*, *corrector*, and the meanings also appear to coincide, though the corrector operates in a strictly defined way, assisted by his *lector*. The compositor's job is, naturally, *componere*, and afterwards *distribuere*, and the types are in *loculi*, boxes, but no term is given for the cases. The copy he works from is the *exemplar*. The press, *prelum*, is operated by two *impressores*, pressmen, using *pilas*, balls, to distribute the ink, *atramentum*, an *ater viscosusque liquor*, over the forme. The term *forma* has been discussed in the text; it is perhaps proper to point out that when not referring to proofs it has a purely physical denotation, as is also primarily the case with the types, *typi*, or more fully *typi litterarii*, though when the most elegant must be selected, the images printing on the paper (the *impressæ litterarum figuræ*) are of course also thought of. The term for printing is the usual *imprimere*. Other team-members, finally, besides the *Typographus*, the master printer himself, are the *typorum fusor*, the typesetter, coming only now and then, and the *complicator*, the gatherer and folder, responsible as well for whatever else needs doing in the shop for which there is not a specialist. The punch-cutter remains too far out of sight to be given an appellation.