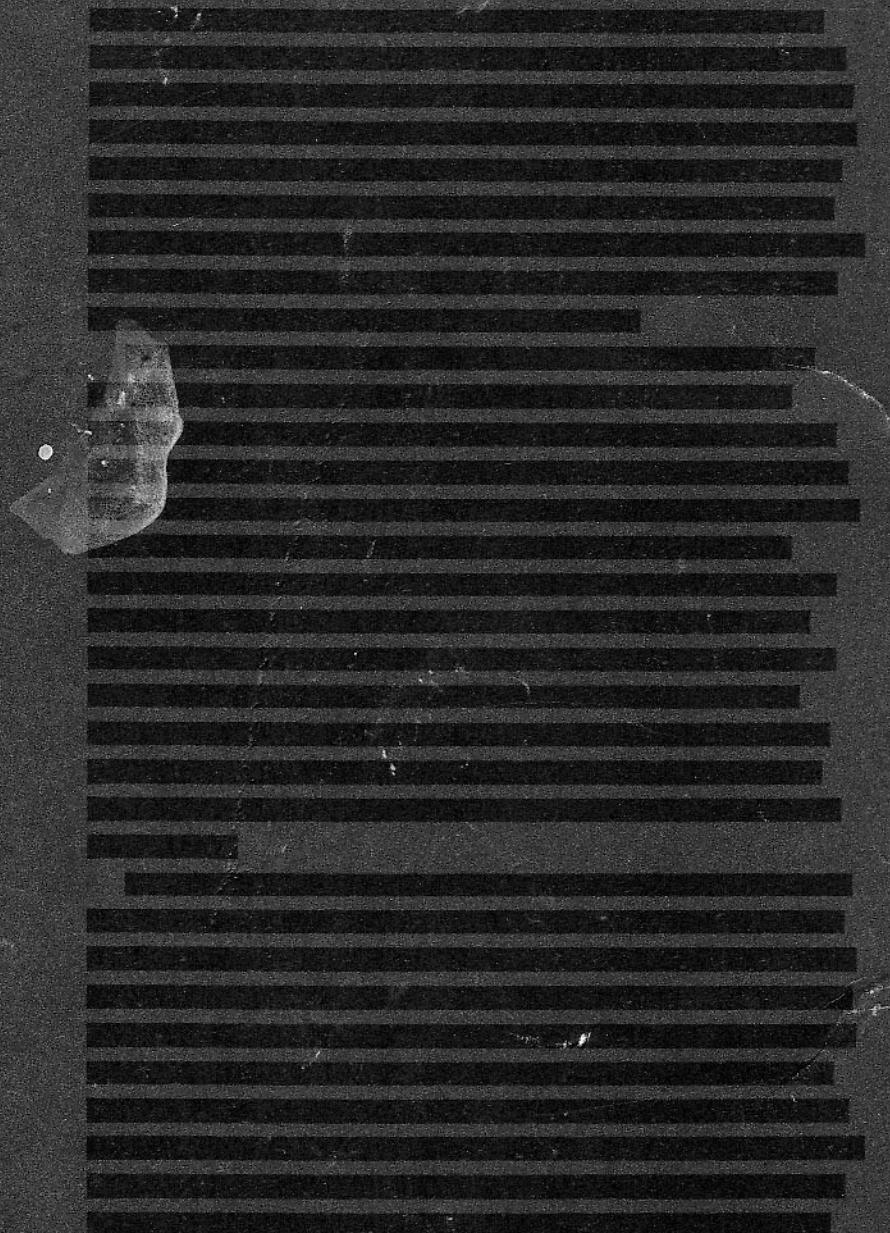


Robin Kinross **Modern typography**
an essay in critical history



I Modern typography

Modern typography?

If the printing process was one of the main facilitators in the development of the modern world, then the phrase ‘modern typography’ may be an unnecessary duplication of sense. Is not *all* typography modern?¹ Certainly a cultural historian might see 1450, the moment of Gutenberg’s movable type, as falling near to the intersection of ‘late medieval’ and ‘early modern’. And, whatever is suggested by large schemes of periodization, the nature of the new process seems to claim the characteristics of modernity. It was a process of mass-production: texts and images could now be made in quantity and in identical copies. Though manuscript texts had been produced as duplicates in sizeable numbers, printing introduced fundamental changes: in quantity, in speed of production, and above all in ensuring the identical nature of the information in copies (allowing for variations of presswork and changes to a text within a printing run). This standardization of the product was as far-reaching in its implications as any of the innovations brought by the new process. It was on the basis of shared, stable and exact knowledge that the modern world came into being.

The process itself implied and necessitated a standardization of materials. A satisfactory product depended on proper alignment and fit of characters, on evenness of printed impression, and these things depended in turn on a normalization of the dimensions of the materials. Early printers may not have had well co-ordinated materials, even within a single workshop, but the implication of such a co-ordination was there in the nature of the process. Similarly, the process suggested a division of labour, although the early printing workshops may often have been small affairs in which work-functions were shared, and although at certain times and in some places the production of manuscript texts was quite ruthlessly divided by the allocation of component parts of a text to different scribes (the ‘pecia’ system).

These qualifications may at least hint at the social grounding of the theme of typography. In this compressed discussion, ‘typography’ will inevitably tend to become an abstracted idea, shedding the human and material reality of which it is constituted. But, although social realities may

1. The argument that ‘“modern” typography began around 1440’ was suggested by Anthony Froshaug in: ‘Typography ancient and modern’, *Studio International*, vol. 180, no. 924, 1970, pp. 60–1.

qualify generalizations about the fundamental character of typography, the fact remains that writing is a single process, while printing is at least two: composition and presswork. Here lies the source of difference between a unitary activity and one that can be put out to workers who may know nothing of each other.

In these broad respects, then, printing is fundamental to the development of the modern world: as a principal means of spreading knowledge, enabling the shift from medieval attitudes to modern ones; and as itself incorporating modern characteristics, of mass-production and standardization, of specialization and division of labour.

The debate over the history of modernity will always be inconclusive.² Different definitions of the concept allow different locations of it, and the proper start of 'the modern' has been placed later than the time of the first printers: with steam power and industrialization, or later still, perhaps with the First World War. This book starts its discussion not at 1450, nor at 1800 nor 1900 nor 1914, but rather at around 1700, and this is a part of its argument. If modernity was implicit in printing, it was not fully or immediately realized by Gutenberg's invention. Printing enabled modernity, but evidence of recognizably modern attitudes in typography only began to emerge some 250 years after its introduction.

The decisive evidence that allows this judgement is of the readiness to articulate knowledge and consciousness. Before the time of this emergence of modern attitudes, printers certainly knew what they were doing. One can see this simply in the fact of successfully produced printed books: for the making of any such extended text requires considerable conscious planning or design. Though little evidence – drawn layouts, marked copy, imposition diagrams – survives to document this, one can surmise that these aids must have been used; one can also assume a process of copying existing formats. But this knowledge was not shared. Early printers, in keeping with the tenor of their times, surrounded their activities in secrecy: for practical reasons (to preserve commercial advantage) as well as in the quasi-magical furtherance of the 'black art'. That this epithet should have survived into this century suggests the persistent, perhaps inherent, surprise and mystery that attaches to the process of printing. Paper is passed over a nonsensical, mirror-image surface to produce – in an instant – text and images, smooth and full of meaning; and the process can be repeated again and again. However, the 'black art' has been the practice of a trade organized along masonic lines: a secretive, male preserve, stubbornly resisting change. 'The trade' appears as a prin-

2. The literature of this debate is huge and various. For some observations from a historian of printing, see Eisenstein, *The printing press as an agent of change*, pp.683–708. See also a brief survey by H. D. L. Vervliet, 'Gutenberg or Diderot? Printing as a factor in world history', *Quaerendo*, vol.8, no.1, 1978, pp.3–28, which tends to support the thesis of the present book.

cipal though usually silent character in this book, as the bedrock of printing. At its best it has been a repository of solid wisdom. But it has also seemed to be an obstacle, especially to bright outsiders who have wanted to take control of the process of production and publication.

The first move in the long process of the break-down of the printing trade was the splitting of the editorial function away from the workshop and into what would become the publisher's office. With this division, printing began to be opened up: its secrets started to be articulated. One might also suggest, as a working definition, that this is the point at which 'printing' separates from 'typography'. This distinction of terms has been latent in discussion of the matter since Joseph Moxon's *Mechanick exercises* was published at the end of the seventeenth century, but has never been fully explained. To over-simplify, the difference is between inarticulate practice with the materials of production ('printing'), and conscious shaping of the product, by instruction ('typography').

One might well argue, with this distinction in mind, that 'modern typography' is indeed a duplication of sense, because when printing becomes typography is also when printing becomes modern. Printing becomes modern with the spreading of knowledge about itself: with the published description of its practices; with the classification of its materials and processes; with co-ordination of dimensions of materials, enabling their exchange and better conjunction; with the establishment of a record of its history. These things, which one begins to see in the late seventeenth century in (especially) England and France, are realizations of the implications of the process of printing: they follow from people using the means of printing to discuss that process itself. With the publication of manuals and histories of printing, with the introduction of common systems of measurement, then the 'black art' is illumined: a process that still continues.

It is as well to make explicit the obvious limitation of this book to the western world, and to typography employing Latin script. This, too, is a part of its argument, for the overlap between 'modern' and 'western' is so great as to make them synonymous. As well as its chronological structuring, the discussion follows a geographical course, moving from country to country (or culture to culture) as each seems to become significant. But the process of modernization is also one of homogenization, and national cultures come to be less distinct. Thus a more extended discussion of current developments would have to consider the situation of typography in the Far East and the effects, throughout the world, of the international manufacturing companies.

Approaches to history

The history of printing and typography has been the subject of different approaches, developed for particular purposes. One may distinguish the following leading strands (representative examples are given in the discussion of sources, chapter 14).

First, there are histories of printing. These have taken technical development as their main subject, tending to be histories of printing machinery. Printing history of this kind has been a phenomenon of the last few decades, and it has been prompted by the need to preserve and record the materials and practices of past techniques.

Bibliographical history has a longer tradition, beginning in the late nineteenth century. This is the study of printed texts and their transmission. It has been conducted as a branch of literary scholarship, taking an interest in processes of printing as the necessary material underpinning for knowledge of a literary text.

A third kind of history has recently emerged from within the ranks of professional historians, as an aspect of cultural history. This has come with the realization that printing and especially 'the book', as it is hypothesized, have been key factors in historical change. Besides this intellectual emphasis, there is the social one: the printing and publishing trades are relatively well provided with surviving documents, and examination of this material has been able to provide rich insights into past life.

The last category is the vaguest and has often been the least substantial: history of typography. Where printing history has focussed on machinery and on the trade, and has been largely produced from within the trade, typographic history has concentrated on the printed products and their design. A special field of examination here has been the history of typefaces, which has also received some attention from bibliographic historians interested in authenticating texts, but the major motivation for this specialization has come from the need to fuel the production of adapted or recreated versions of past letterforms. Typographic history has largely been produced by practising typographers, whose emergence (in this century) it has closely followed. The connection with practice has been of mixed benefit. While one may point to shining examples of the fruitful interplay of practice and historical scholarship, it would be possible to fill shelves with works crippled by an absence of historical skills and by superficial notions of design. This kind of history is the only one to recognize the aesthetic factor in printing, but it has had the tendency to do little else but view. One may deride printing history for its blind-

ness to the visual and its fixation on details of machinery, but it has at least done its time in the archives; typographic history has tended not to get beyond the reproduction of products, with accompanying rituals of admiration and distaste.

This book belongs to the category of typographic history, though it represents an attempt to criticize the existing model for the genre. This critical effort has been conducted partly through incorporating insights from these other kinds of history and from enquiry outside typography: in architecture and design, and in historical and theoretical discussion more generally. But the opening out of typographic history can here be only a matter of hints and suggestions: its full elaboration would require years of investigation into the everyday interactions of typographers, printers, their customers, and the public at large. (And this last above all: for the major absence, in this book as in all works of typographic history, is the reader or user of printing.) A more immediate and more achievable task is the suggestion of new directions for typographic history, within its existing terms, by way of rapid outline and substantiated by necessary detail. It is this that the present essay attempts.³

An approach

To take the theme of the modern as central at once questions the prevailing pattern of typographic history. This pattern has been most evident in Britain, but Britain has been the main home of this history and an exporter of it. The norm for existing history is traditional typography, so conceived; modern typography, where it is recognized, is isolated as 'modernist' and then treated, briefly, as an eccentricity. Modernist typography is held to be an incursion of artists blundering into the quiet preserves of book-printing and there violating the wisdom of tradition and convention. (The assumption, usually unspoken, that all typography is book typography is another characteristic of existing typographic history.) This view, expressed most clearly and influentially by Stanley Morison, has come to colour all discussions of the subject, even the few extended treatments of modern or modernist typography. Thus books about 'the pioneers of modern typography' or 'Bauhaus typography' situate their subjects in a vacuum, without historical precedent and without relation to the unmentioned but implied contemporary traditional norm. The hope of this book is to break down such separations, and to show that there are modern elements in what has been regarded as traditional, and that there is a tradition behind what has been taken to be just 'modernist'.

3. The necessary speed and relatively high level of the discussion have made it inappropriate to provide any extended explanation of technical processes or of the terminology of typography. Readers new to the field will find help in the plentiful introductory literature to printing and typography.

A difference of emphasis of this essay arises from a shift of attention, away from products (and the untroubled reproduction of images of them) and towards the ideas that inform production: though a strategy for dealing with the evidence of artefacts is attempted in chapter 13. The products that are discussed here are sometimes made from printed paper, sometimes they are printing presses, sometimes 'typefaces' (a troubled notion), sometimes computer languages, or whatever material the essay-discussion finds it necessary to take account of. This emphasis on ideas relates to the thesis of what constitutes modernity: the discussion, description and ordering of practice, rather than mere practice and mere products. It is clear that, on this view, the subject of such a history is as much what people have said as what has issued from their practice.

There are other aspects to the stress on ideas. It enables the historian to move closer to the processes of design than does the simple reproduction of products. This may appear odd to those who assume that the design is the product. That is a view superficial in the literal as well as metaphorical sense of the word, and which ends in equating design with ornament: the border of printers' flowers that pleasantly divert from dull text. In this essay, 'design' is understood not as a noun but as a verb: an activity and a process. And, in this light, ideas become as real as inked sheets of paper.

Such an emphasis on thought and intention also has the advantage of generating a clearer view than one that gives priority to products: a summary becomes more possible. This is something that is hard to achieve when contemplating the vast numbers of products that might conceivably be discussed, or the arbitrary and perhaps very small selection that is actually available for inspection. Limits on the material available to the typographic historian have encouraged the formation of a canon of products considered to be exemplary: images that are passed, without recourse to an original specimen, from book to book.

There are, of course, important objections to a history that would rest on ideas. People do not do what they say, and to take their words as unquestioned truth and to deduce action from words leads to idealization and falsity. And such an emphasis gives improper prominence to those who are articulate and who have access to the channels of publication.

The first of these objections will be met by a realistic attitude, which can understand the context of discussion and which knows the arbitrariness, muddle, ambitions, deceptions and naive hopes that surround any human endeavour. The goal must be a total history that relates ideas to

products, and not just to final products. These are the visible tip of designing. But beyond and beneath them is the mass of material (marked copy, layouts, dummies, and so on), which could – if it can be found – reveal the process of design and production as no finished item can. That histories of typography – not excluding the present text – should pay so little attention to intermediate products is another sign of their superficiality.

The second objection to an emphasis on ideas – that it gives undue prominence to the articulate – amounts to an objection to the positive argument of this book: that typographers need to incorporate critical reflection into their own practice. This informs the judgement implied in the selection of figures for discussion here: special attention is paid to those typographers who have been articulate about practice. The risk may then be that one replaces a cult of great creators by one of great articulators. No cults of the individual are intended here, though individual people are allowed an honourable place in this history. A way between a history of hero-worship and its opposite of a history devoid of all human presence lies in the critical examination of individual cases. Merely to utter is not enough: what is said has to be evaluated. This argument does not suggest that writing about the activity is a necessary qualification for its proper practice. But it does assert that enquiry, reflection, discussion, are activities that enhance designing and making. The thought that accompanies making need not issue as printed or written words, nor even as speech, but it may still be traced in the product. In this way products can themselves be ‘articulate’, though their makers may not have spoken. One thinks of certain pre-industrial punchcutters, or of countless unknown compositors.

This essay, then, does have a certain polemical purpose in its preference for the articulate. And, in the same spirit, it assumes that value lies in editorial quality, in the content of text and images, in their accurate transmission, and that notions of ‘beauty’ are best left undiscussed, or, at least, construed in the light of these primary tasks of printing. This may explain the selection of subjects discussed here, and the short shrift given to some of the staple subjects of typographic history – Baskerville, Bodoni, the post-Kelmscott private presses – whose reputation rests on superfluous books of doubtful textual accuracy, meant for viewing rather than for reading, or as investments. The cult of ‘fine printing’, with its fetish of the title-page, has been questioned often enough, and by celebrated typographers (Jan Tschichold, Eric Gill), but it seems to persist.

Faced with its complacent monuments, one turns rather to work that shows some life.

One means of circumscribing and rooting the ideas discussed in this history is through reproduction of artefacts. This is a purpose of the illustrations that comprise the visual component of the essay. The intentions and methods in making these images are outlined in the note that follows the sequence 177.

The text of this essay depends very heavily on printed sources, including much material that is secondary to its subject, or is even further removed. This is not a very happy state of affairs: there is a strong risk of retailing stories that have been told (and distorted) many times before. The least an author can do is be frank about this, disclosing and discussing sources. The last chapter is devoted to this matter: it is meant to provide readers with some help in extending their knowledge, and to suggest that this book is the product of one voice in dialogue with many others. It has been written in the desire to prompt critical discussion and critical practice.

2 Enlightenment origins

The first manual

The beginnings of a separation between ‘printing’ and ‘typography’ can be located in the famous first definition of ‘the typographer’. In the preface to his *Mechanick exercises: or the doctrine of handy-works applied to the art of printing* (1683–4), Joseph Moxon wrote: ‘By a typographer, I do not mean a printer, as he is vulgarly accounted, any more than Dr Dee means a carpenter or mason to be an architect: but by a typographer, I mean such a one, who by his own judgement, from solid reasoning within himself, can either perform, or direct others to perform from the beginning to the end, all the handy-works and physical operations relating to typographic’.¹ One could apply this sense of ‘typographer’ to some of the earliest printers, who, although commonly called ‘printers’, played a directing role, rather than working as part of a production team: Aldus Manutius and other scholar-printers would provide the clearest examples. Moxon is thus articulating a function that has its origins at the start of printing: the process was by its nature one that required a co-ordinating or overseeing figure. We are thus returned to the idea, raised in chapter 1, that printing has within it the seeds of modernity.

The importance of Moxon’s definition is that it came at the opening to the first extended published discussion of printing. With the *Mechanick exercises*, printing received its first extended theoretical treatment, and thus moved out of a state of unconsciousness. The book was primarily an intensely practical manual, with minutely detailed descriptions of the operations of making, composing, and printing from, type; but the dimension of theory could not be avoided. Thus the preface included a sketch of the invention and progress of printing. For the first time, printers could acquire some sense of the history of their practice, which was thereby raised above the level of blind ‘practice’. And the whole effort of describing methods of work and of formally naming mechanical parts inevitably introduced a new sense of order into the practice. As a process of multiplication and of proto-mass-production, printing might imply system and standardization, but between individual operations (typefoundries and presses) there was little or no compatibility of materials. The essential modularity of printing could not be fully realized, and

1. Moxon, *Mechanick exercises*, pp. 11–12 (spelling and punctuation of the edition retained). Moxon’s reference is to John Dee and the preface to Dee’s edition of Euclid (1570).

capitalized on, until common standards of description and manufacture had been worked out and adopted. Progress towards this state depended on published information and discussion. This brings us near to an essential constituent of the sense of 'modern' as it is here being used. Modern typography exhibits a rational impulse, both internally in ordering its own workings, and externally in the face it presents to the world.

In Moxon's book there was no concerted advocacy of ways of rationalizing typography: he was concerned simply to describe and to pass on knowledge of methods. He stands at the start of a line of purveyors of 'useful knowledge': a British empirical tradition that operated without the larger (notably French) ambition of constructing systems. The nearest that Moxon comes to advancing an explicit theory is in his description of designing and cutting letters as type. He wrote in a context in which there was no agreement among typefounders on standard sizes for printing type: neither the 'height to paper' nor size of body (and thus of image). Despite the predominance of a few large typefoundries and an international market in type, there was no common nomenclature. Even less was there a system of typographic measurement. But, in any case, general (non-typographic) systems of measurement were still casual and un-coordinated even within state boundaries. The method that Moxon proposed as an aid to designing letters was to 'imagine (for in practice it cannot well be perform'd, unless in very large bodies) that the length of the whole body is divided into forty and two equal parts': seven parts, each of which had six subdivisions.² This then became the system by which proportions of letters were calculated, so that regularity was introduced into their appearance, over a set of characters and in different sizes. But there was no attempt to relate this scale to any existing system of measurement, nor to devise a system of measurement internal to typography. A principle for relating typographic elements (type and spacing material) to one another existed then only residually and casually, in the names given to sizes of type, which were by this time agreed in the main printing languages. Some order is evident in these names, and it can be seen as lying at the foundation of the system of point-size designations that finally emerged in the twentieth century. Thus the traditional English name of Pica was translated into '12 point', Double Pica into '24 point'. Moxon did suggest numerical values for these designations, in relation to the English foot, but he was doing no more than roughly summarizing existing practice.³

2. Moxon, *Mechanick exercises*, p.91.

3. See: Moxon, *Mechanick exercises*, p.21, and the editors' note.

Rationalization of letters

After Moxon, and without any reference to his book, steps towards further ordering the practice of typography came during the following century in France. The first of these, the design of the ‘romain du roi’, is usually seen just as an episode in the history of letterforms, though the project was conceived with rather wider ambitions. It arose as part of a proposed study of craft techniques (for their eventual improvement) to be undertaken by the newly founded Académie des Sciences. A committee was set up in 1693, and a report of 1699 described its progress: ‘We have begun with the art which preserves all others – namely printing. Monsieur Jaugeon, who took it upon himself to describe one aspect, has first of all gathered together alphabets of every language, both dead and living, with a supplement to each one, showing characters peculiar to certain sciences such as astronomy, chemistry, algebra, and music. Next, no longer restricted to simple description, he showed the Academy a new French alphabet that had been chosen to please the eye as far as was possible.’⁴ By this time, therefore, what had set out as an investigation of all trades, and printing first of all, was now concerned with the design of a particular set of letterforms: the ‘romain du roi’. This existed first as a set of engraved plates, which were added to and modified over the years (up to 1718). And it existed also as a set of punches and types, which seem to have followed the forms of the early plates, and which were used to print a book: the *Médailles du règne de Louis XIV*, published in 1702 from the Imprimerie Royale. The committee of the Académie was thus, in effect, working for the King: the Imprimerie Royale had been established by Richelieu in 1640, thereby formalizing the long tradition of nominating ‘printers for the King’. The collaboration shows clearly the centralization of political and academic authority that was peculiar to France. In England, Moxon, though he became a Fellow of the Royal Society, wrote and worked simply as an individual, living by his trade.

Two features of the work of this committee introduced new elements of system to printing. As a preliminary to the design of the new alphabet, the committee drew up a table (dated 1694) of the proportions of the types at the Imprimerie Royale. This goes further than Moxon’s correlation of names and feet-equivalents, in giving unit values for the bodies of each named size: from $7\frac{1}{2}$ units to 192 units (poster types) in 20 steps. The unit is however not related to any system of general measurement. The second and more celebrated feature of the ‘romain du roi’ was the grid against which the letters of the engraved plates were represented,

4. A. Jammes, ‘Académisme et typographie: the making of the romain du roi’, *Journal of the Printing Historical Society*, no. 1, 1965, p. 73.

and by means of which they were constructed.* In its first form, this grid comprised 64 squares (8×8) for capital letters; later, each unit was subdivided into 6, to give 2,304 squares. Even in its simpler form and in the largest sizes, this system could not be of much practical use in cutting punches. And, in any case, the type of the *Médailles* was produced before the majority of the plates had been engraved. The plates were important rather as theoretical demonstrations: suggestions of what might happen if letterforms were designed according to rational principles, and with less regard to what were by then established conventions. Thus, in some of the plates, the italic forms become 'sloped romans', by a consistent deformation of the rectangular grid. The 'romain du roi' can be seen as an innocent anticipation of the conditions of type design and text composition in the later twentieth century.

The first French printing manual appeared in 1723: *La Science pratique de l'imprimerie* by Martin Dominique Fertel†. The author, who was also the book's publisher, was primarily a jobbing-printer, printing books only occasionally. Fertel worked in Saint-Omer in the north of France and, in this provincial situation, he was quite without the advantages of the centrally placed and powerful Académie. He also provides a striking contrast with the metropolitan Moxon. Though both wrote manuals of practice, addressed to fellow printers and to apprentices, where Moxon emphasized materials and 'handy-works', Fertel's book is notable for its stress on the organization of the text (it is largely concerned with book printing). With Fertel there appeared for the first time a conscious concern with the structuring of verbal information through the devices of typography: size and style of type, headings, subordinated text, space, ornaments, symbols. Some specimen pages showing typical configurations were included, and were annotated with explanatory comments. The author also takes his own text as material for instruction, pointing out how he is using the typographic repertoire: thus the list of errata in the book is given as an example of such a list. In all of these aspects, Fertel's manual exemplifies this new attitude of rationality: concerned to understand how typography works and to explain it to others.

Point systems

Some of the suggestions from the committee of the Académie reappeared as elements in the work of Pierre Simon Fournier ('le jeune'). Fournier started his working life in the typefoundry of his elder brother, who at this time (around 1730) had acquired the materials of the Le Bé foundry.

* See example 1, p.145.

† See example 2, p.146.

This had been the major foundry in France, and possessed the authentic types of Garamond and Granjon, cast from sixteenth-century matrices. Fournier set up his own typefounding business in Paris in the 1730s, issuing a first small specimen in 1736. In 1737 he published a table of proportions for printing type. This followed the table of the Académie, but there is no evidence to suggest that Fournier had seen that earlier scheme, which existed only in manuscript. The situation of starting afresh would have provided the right encouragement for this proposal; and Fournier was working in a climate of growing consciousness of printing, as the publication of Fertel's book suggests. And in 1723 there had been issued a decree to the French book trades which sought to fix a standard for the 'height to paper' of type: without success, for established foundries and printers would naturally resist the necessary reinvestment costs, though Fournier adopted it.

In Fournier's proposal of 1737, a system of graded body sizes was now expressed in terms of units, which in turn were related to the 'pouce' (the French 'inch'). The unit was the 'ligne', a twelfth part of an inch; a 'ligne' was divided into 6 'points'. There were thus 72 'points' in the inch; and this proposal provided the foundation of the system eventually adopted as a standard in the English-speaking world. In 1742 Fournier published his *Modèles des caractères de l'imprimerie*, in which was reprinted the table of proportions. (That the system depended on a scale rather roughly printed on paper suggests the lack of critical accuracy that was then acceptable.) The *Modèles* was principally a specimen of the types that he had cut for his foundry, and it also included a little history of printing, and remarks on the types shown and on the advantages of systematizing body sizes. Though Fournier has been celebrated for the ornaments he designed and, sometimes rather grudgingly, for the forms of his typefaces, one should also notice that the first suggestion of the 'family' of types comes in his work: three variants ('ordinaire', 'moyen', 'gros œil') of a 'cicéro' type were shown in the *Modèles*. The veins of systematization and of decoration were thus interwoven in his work: ornaments were cast on standard bodies, for easy combination. It was natural that Fournier should be involved with the *Encyclopédie* (providing material for the article on 'caractère') and that he should publish, towards the end of his life, as a 'summa', a *Manuel typographique*. He envisaged this as comprising four volumes: on type, on printing, lives of the great typographers, and specimens of type. Only the first and fourth were done (in 1764 and 1766) before his death in 1768. The *Manuel* contained a simplification of

Fournier's point system: the 'ligne' was discarded and a scale of 2 'pouces' divided into 144 parts was shown. The specimens also showed considerable elaboration of the idea of variant forms of a given size and style of type: the co-ordinates of variation cannot be exactly defined (or couched in twentieth-century terminology), but, roughly expressed, they were those of the vertical proportions of the letterforms, relative to the body of the type, and of the width of the appearing letterforms.

Modern letters

Pierre-Simon Fournier may be seen as standing at a mid-point in the development of a more rational, enlightened typography. One can perhaps adopt the term 'transitional', sometimes used to categorize his types: transitional, that is, between the 'old faces' of – above all in his context – the school of Garamond, and the 'modern' typefaces that were to become the fashionable norm in France towards the end of the century. With this latter term one is brought back to consider the question of 'modern typography'.

In typography, in the English language only, 'modern' has come to be used to describe that category of type design whose beginnings may be seen in the 'romain du roi', and whose first proper appearance has been located in a type of François Ambroise Didot of 1784.* One finds the word acquiring this sense in such phrases as 'modern-cut printing types' (Caleb Stower, 1808) and 'modern or new fashioned faced printing type' (Richard Austin, 1819).⁵ And even in Fournier's *Manuel typographique* there is a display comparing his 'italique moderne' against an 'italique ancienne'.⁶ As a term of stylistic categorization, 'modern' now describes the treatment of serifs (flat and unbracketed), modelling of stroke width (abrupt and exaggerated), and the shading or stress of letters (vertical). This development followed the greater presence and fashionable success, during the eighteenth century, of letters printed from engraved plates: the departure from the old-face norms of these letters was partly entailed by the nature of the engraving process. And the fashion for very thin strokes in type may also be attributed to the development of smoother papers and of presses that could be operated with greater precision. 'Modern' in the typography of the Didot family and of Giambattista Bodoni describes this kind of letterform deployed in arrangements that were unornamented or decorated only with the patterns and devices of the neo-classical style. But, beyond polite fashion, the style carried with it a vision: that of a shedding of rococo baggage, a return to fundamentals and to the order of

* See example 4, p.148.

5. Caleb Stower,
The printer's grammar,
London, 1808, facing p.530;
Richard Austin, quoted and
reproduced by Johnson,
Type designs, pp.74–5.

6. See the reproduction in
Updike, *Printing types*, vol.1,
facing p.264.

Garamond
Fournier (transitional)
Modern (Didot 1784)

the classical age] It was, indeed, entirely appropriate as the style of the new republic in France.

If the term ‘modern’ as a hard and defined category of type design dates from well after its first appearance, the shift from an old to a new was certainly a conscious matter for those who were making it. In 1771, towards the end of his life, Louis Luce published his *Essai d'une nouvelle typographie*: a specimen of types he had cut while employed as a punch-cutter at the Imprimerie Royale. The newness of this ‘new typography’ lay in the forms of letters and of ornaments, and in their systematization (of the ornaments especially). Luce had published his first specimen in 1740 and seems to have slightly preceded Fournier in taking up the idea of condensing letterforms. This development appeared first in types from the Netherlands, an association that Fournier perpetuated in his phrase ‘le goût Hollandais’. The motivation for this turn towards narrower letterforms may have been – as the term suggests – a matter of taste. But the style entailed economic advantages. Luce gave no hint of this in the ‘Avertissement’ to his *Essai*, being there principally concerned to differentiate his letters from those of the ‘romain du roi’ (which he would have worked on in its later stages); he suggested that his types related more closely to contemporary handwriting than those of his immediate predecessors at the Imprimerie Royale. The economic advantages became more explicit with Fournier, who used the name ‘poétique’ for some of his condensed types, thus suggesting their advantage in setting the long (twelve-syllable) lines of the Alexandrine verse form without the need to break. But elsewhere he indulged in some disparagement of ‘le goût Hollandais’ – condensed forms and with large faces on the body of the type – and of the Dutch, whose concern to make money ‘has led them deliberately to acquire types of a cramped, starved look, so that they may get in more words to the line and more lines to the page. They are not troubled by their ugliness, provided they are profitable’.⁷

Apart from developments in letterforms, Fournier’s work in systematization was taken up and developed by members of the Didot family, who dominated all aspects of typography (typefounding, paper-making, printing and publishing) in France in the later eighteenth and early nineteenth century. François Ambroise Didot, primarily a typefounder, adopted Fournier’s point system but related it to the general system of measurement then standard in France: the ‘pied du roi’. In this modification, 72 points were made to equal the standard French inch. And further in the spirit of rationality, he proposed that the traditional names

7. From an article of 1756, quoted by Hutt, *Fournier*, p.46.

See example 3 (p.147) for a type that shows these Dutch characteristics.

of body sizes be discarded in favour of point-size designations. Didot also suggested that the 'cicéro', the standard for determining sizes of type (6 point, 8 point, 12 point, and so on), be changed from 12 to 11 points, to compensate for the larger value that the departure from Fournier's point had brought. But 11 is not exactly divisible and does not allow the modular approach that is necessary to typography. This proposal was not taken up; but the 12 point 'cicéro' and the relation to the 'pied du roi' were generally adopted, and it is this 'Didot' system that is still current in typography, outside the English-speaking world. With an irony that has dogged attempts at standardization in printing, soon after F. A. Didot's proposal had been formulated and accepted, the metric system was established in France: its terminology had been devised by 1795 and the system was given legal status in 1801. In 1811 an attempt was made by Firmin Didot (son of François Ambroise) to introduce a metric point (with a value of 0.4 mm), but by then the inch-based point was too well established, and the proposal did not command the support of the Emperor. The next steps in the history of typographic measurement were taken in the USA, and belong to another phase of systematization, in the context of further mechanization of printing.

Another element in the rationalization of typography appeared fleetingly at this time in republican France. This took the form of a law of 1798 for the regulation of the sizes of stamped papers.⁸ Sizes were to be derived from a sheet 0.25 square metre in area, with lengths of sides having a constant ratio of $1:\sqrt{2}$ (1:1.41). Two years before this, the scientist and writer Georg Christoph Lichtenberg had put forward this principle of constant ratio for book formats, though without suggesting measurement values.⁹ There is no evidence to suggest that Lichtenberg's proposal was known in France; and once the principle of constant proportion had been formulated, the solution of $1:\sqrt{2}$ could be found, as Lichtenberg remarked, by 'any beginner in algebra'. This system was nowhere generally adopted, and paper sizes remained subject only to the rough and differing systematizations of separate makers: until the unified standard along these lines was instituted in Germany, to become a central element of the new typography of this century (see chapter 8).

Style and servicability

8. The 'loire sur le timbre' of '13 Brumaire an 7' (3 November 1798), reprinted in: J. B. Duvergier (ed.), *Collection complète des lois*, 2nd edn, vol. 11, Paris: Guyot, 1835, pp. 33–41.
9. G. C. Lichtenberg, 'Über Bücherformate', *Göttinger Taschenkalender*, 1796, pp. 171–8; reprinted in the *Vermischte Schriften* of Lichtenberg (Göttingen: Dieterich, 1803, and later editions).
10. See: D. B. Updike (ed.), 'A translation of the reports of Berlier and Sobry on types of Gillé fils', *The Fléuron*, no. 6, 1928, pp. 167–83. One might observe that Sobry's argument exactly confirms Updike's own preferences.

The question of a modern typography was given some illumination in a document from Paris in 1800.¹⁰ The printer and typefounder Joseph Gillé ('fils') had submitted for comment a specimen of his ornaments and types

to the 'Société Libre des Sciences, Lettres et Arts' in Paris. In a climate in which awareness of printing seems to have been quite notable – the climate of the *Encyclopédie*, above all – one might imagine that such an event was a normal occurrence.* However, in his address to the Société, Citizen Sobry, a printer, noted that Gillé was 'the first artist in typography to consult scholars', and, he suggested, 'it was high time for such a move to be made'.¹¹ He then went on to appraise the specimen and especially the roman and italic letters: 'To say that Citizen Gillé's types are engraved [cut] in the style and according to the system of the present day, that is, of Didot, and that they are executed with all Didot's refinement, would be equivalent to saying that Citizen Gillé had reached the zenith of his art, if renown were a sufficient title to pre-eminence. But what happens to be the fashion is not always perfect, and to come to a decision in a case like this, the proper thing is to follow principles rather than the vagaries of taste.'¹²

Sobry's objection was that Didot (presumably François Ambroise) had pushed the art of printing and of cutting letters 'to a destructive ultra-perfection. In lending it certain secondary qualities he has taken from it the one essential quality; and Citizen Gillé, who works in his style, may, like him, be praised for his efforts but hardly for his achievement'.¹³ In text set in the most refined Didot moderns, the reader's progress was impeded by the sheer formal beauty of the letters, which were too light in colour and in which similarities of form were emphasized. By contrast, old face types were darker and their letters more differentiated: one read without being conscious of reading. This had seemed to be proved in an experiment cited by Sobry:

When Didot was beginning to bring his system into vogue, the last of the Anissons, who always refused to adopt it for the Imprimerie Nationale, established a comparison, which, if the report had not been hushed up, would have enlightened the general public as to the defect, in principle, of the innovation. Anisson took a page printed from the types in the Didot manner, and had it copied with the same spacing, in types of the same body, but in Garamond's manner. He put the two pages beside one another on a reading desk and placed the experts in front of them. At first they read the two pages without noticing any great difference. Anisson made them read the pages again and again, each time at a greater distance, until they could not distinguish the print at all. It turned out that the page which it was possible to make out longest was the one printed on Garamond's system, and this was

* Gillé's prospectus (example 5, p.149) constitutes one document of this awareness, and gives a sight of his types.

11. Updike, 'A translation', pp. 175, 176.

12. Updike, 'A translation', p.178.

13. Updike, 'A translation', p.178.

readable several stages after Didot's characters had become indistinguishable. This experiment, which everyone can make for himself, is a fact which peremptorily decides between the old and the new types.¹⁴ This is the first reported experiment into legibility, and though, like many experiments since, it was crude, it did embody the critical spirit in typography. Modern typography in the eighteenth century, while incorporating an impulse towards rationality and system, also issued in a style that exceeded the limits of reason. The address of Citizen Sobry was a call to order, for a typography that served the reader, and against a self-regarding stylism. If he spoke against the 'modern', he was in favour of a truer rationality, and perhaps a truer modernity: 'The printer's art will soon be restored to its pristine splendour if an artist, anxious to do as well as is Citizen Gillé, takes upon himself the task of bringing it back to its first principles by putting aside the sort of superficial prettiness that some have introduced into it, to its obvious degeneration.'¹⁵

14. Updike, 'A translation', p.181.

15. Updike, 'A translation', p.183.

3 The nineteenth-century complex

Nineteenth-century typography has commonly been characterized in terms of loss of standards under the pressures of industrialization, and then regeneration. In this version of typographic history, 'modern' typefaces became ever thinner and spikier, until the return of 'old face' types: first in the revival of Caslon typefaces, and then in the more full-blooded reaction of the Kelmscott Press, which sent shock waves across the world. And, in Pevsner's famous thesis, it was William Morris's decision to take up design that, by some dialectical shifts, led on to the twentieth-century 'modern movement'.¹ Any examination of the question of what was modern in nineteenth-century typography must include both technical and stylistic changes, but there are other factors too. A consideration of these other aspects, especially of attempts to describe and rationalize typography, suggests that the story of decline and regeneration is too simple.

Mechanization

The major phenomenon of the period is certainly the introduction of powered machinery into the printing trade, and its consequent industrialization. As has often been remarked, in 1800 most printers were working with processes and equipment that had not changed for 300 years. By the end of the century, in a printing shop of any size, in Europe and the USA, the press would be power-driven, paper would be machine-made, finishing processes (collating and binding printed sheets) would usually be done with the aid of powered machines, and typesetting would quite possibly be carried out with Linotype or other composing machines (and certainly so within another twenty years). This modernization of printing entailed a greater division of labour, as individual operations grew in size, and as work-processes became more specialized with the introduction of complex machinery. But this tendency should not be over-exaggerated: even in the most industrially advanced countries (Britain and the USA), a large rump of small printers, setting by hand and printing perhaps by foot-driven treadle press, remained active well into the twentieth century. So too, the finishing processes continued to require a large contribution of hand-work from unskilled and sweated (usually female) labour.

1. See: N. Pevsner, *Pioneers of modern design*, revised edn, Harmondsworth: Penguin Books, 1960, especially chapter 1.

The mechanization of the printing processes might plausibly be imagined as a leapfrog race, with each component process being speeded-up in turn: development in one part forcing a quickening of pace in others, and the whole being stimulated to supply a demand for more printed matter, and the greater output in turn seeming to encourage greater demand. The pace was forced by the newspapers (and, in Britain, especially by *The Times*), where success was critically dependent on large runs and rapid production. Dates of invention and patenting bear no simple relation to dates of widespread application, which are the most interesting and significant indicators, but also the hardest to discover. However, something of the progress of mechanization in printing can be suggested by listing the order of major inventions. The first successful paper-making machine (a water-powered mill) was patented in 1799 in France, in 1801 in England. Iron platen hand-presses were developed from 1800; the first powered cylinder press was in use at *The Times* in 1814. The first effective typecasting machine was patented in 1838. A machine for cutting punches was developed by 1884. Machines that both cast and composed type began to be produced in the 1880s. The mechanization of finishing processes – cutting, gathering, sewing, binding – presents an especially complex and protracted development. This was due partly to the complexity of the operations, but also to plentiful resources of cheap human labour: compositors were a more select group and their sphere was mechanized only in the face of notable resistance from workers, and under the threat of labour being imported from outside the trade. One can say that by 1900 most of the larger binderies would have been substantially mechanized.

Two new processes of this period should also be mentioned: lithography and photography. ‘Typography’ is here being widely and generously understood, to include much else besides metal types and their effects. But for a long time, and sometimes still, lithographic and typographic (or letterpress) printing were seen as having nothing essential in common. This conceptual separation corresponded to another distinction, between text and image. The process of lithography was discovered around 1798, but its potential for what might be called ‘useful printing’ (as against ‘artistic’) could at first be realized only in small-scale applications: the printing of notices or business cards, or informal publications in limited numbers. For as long as text for lithographic printing had to be written by hand or first set in type, printed by letterpress, and finally transferred photographically to a lithographic printing surface, then

lithography could find only special applications, such as the printing of music and of maps. Its progress was speeded with the invention of offset printing on a cylinder press, towards the end of the century. But lithography only really came into its own, as a general method of printing, with the widespread application of photocomposition, from the 1950s onwards. Similarly, photography first came to play an important part in printing some decades after its first stage of development, in producing half-tone blocks for letterpress printing (this process was patented in 1881).

The view that the application of steam and, later, of electrical power to the printing processes led to a fall from grace, in the quality of the product, has often been expressed or implied: it was a prime motive of the 'revival of printing' movement at the end of the century. But any survey of the average products of earlier printing would suggest that the idea of a 'fall' is a myth. Standards of press-work only improved with powered printing. And, while intelligence in composition of text (leaving aside notions of beauty) is a matter that is not open to large-scale generalization, there is much to be said for the 'functional tradition' in nineteenth-century typography (as in engineering and building). If powered presses and mechanical composition divided labour at the expense of overall control of a job, the system whereby a text was divided between workers had been instituted already in the days of hand-composition. At the leading edge of the trade in Britain – in London and other metropolitan centres – compositors were usually paid by a precisely calculated piecework system, rather than by a weekly wage: this tended to encourage cutting corners for quick results, with text treated in units of length rather than of meaning.² In other words, it was not technical development as such that caused the loss of control over the product, but rather that the new machines were incorporated into a larger development of quality being trimmed and sacrificed, for the sake of maintaining or improving cash profits for owners. The situation of unruly, dissenting, and exploited workers had always been characteristic of printing. One may cite the observation of a historian of book-production in eighteenth-century France:

The 'bourgeois' retained most of the power and manipulated it brutally, by hiring and firing, while the workers responded with the few devices at their disposal. They quit, they cheated on their 'voyage'; they collected small advances on the next week's work ('salé') and then disappeared; and sometimes they spied for rival publishers or the police. Although they may have felt some pride in their craft they

2. Principles of costing a job are explained in the manuals of the period. See, for example: Jacobi, *Printing*, pp.131–8.

took shortcuts and compromised on quality where it made labor easier. The results can be seen in any copy of the *Encyclopédie* today – clear, crisp typography for the most part, but margins askew here, pages misnumbered there, uneven register, unsightly spacing, typographical errors, and smudges – all of them testimony to the activity of anonymous artisans two centuries ago.³

New needs, new means

One of the ‘complexes’ of the nineteenth century was the interaction of demands for new kinds of printing with new means of transmitting information. Thus the need for election posters, railway timetables, manufacturers’ catalogues, pictorial papers, and so on, consorted with the development of presses able to print these things, and with the invention of the visual means (processes of pictorial reproduction, typefaces) that could articulate such information adequately.* In the field of letterforms, the departure from norms that the modern face represented seemed to open the way to an almost unlimited series of variations, extensions, and exaggerations, in display typefaces. Two categories of letter, which can be derived from forms that appeared in the first half of the nineteenth century, were to become essential constituents of the new typography of the twentieth century, and, in this perspective, may be singled out for special notice. One was to become a new style category – the sanserif – while the other would become a variation applied to all styles of letterform: bold type.

Sanserif, as a printing type, made its first appearance in a specimen of 1816 (of William Caslon IV), though it became established as a recognized style of type only in the 1830s in England. At first its associations were those of the classical world or of ancient Egypt: in the 1816 specimen it was termed ‘egyptian’, and would thus be grouped with other heavy and more or less monoline types of the period. But where egyptians proper – as we now identify them – had slab serifs, this mutation did without any such protusions. Other early sanserif types were called ‘grotesque’, and this term has stuck, to describe (in English and in the German ‘Grotesk’) nineteenth-century, anonymously designed sanserifs – before the more formally sophisticated and trade-named typefaces of the twentieth century. In the USA, the name for this letter was and still is ‘gothic’ (which in Britain has been used as another name for ‘blackletter’). Both the European ‘grotesque’ and American ‘gothic’ suggest the primitive qualities of the letterform. It was seen as a kind of ur-letter, ancient and ele-

³ Darnton, *The business of enlightenment*, p.228.

* See example 6, p.150.

mental, and thus, in the context of early-nineteenth-century neo-classicism, it possessed a kind of modernity. These were the letters of the iron steamships or the Euston arch.

An emboldening of letters had begun to be apparent in the development of the modern face, and was especially evident in the early English moderns. With the need felt for larger public notices, and with presses more able to print them, letters had to become larger and bolder and more various in form.⁴ This requirement seems to be at the root of the proliferation of display typefaces in this period; but the principle of thickening came to be applied to all sizes of type. The use of 'heavy' type for emphasis within text of a normal weight may be seen in examples of English printing from at least the 1840s onwards: small posters, timetables or other kinds of essentially informational printing, where the need to articulate content overrode considerations of good taste and the conventions of book printing.⁵ The category of letterform that came to be a standard for this use was first shown in an English specimen of 1848: the Clarendon, whose tapering or 'bracketed' serifs sorted better with roman letters of normal weight, than did the more square-cut egyptian. Although the first Clarendons were designed by their founder (Besley) to be used with a related type of normal weight, they can be found set with letters of no close stylistic relationship. And, for the printing trade, 'clarendon' came to mean any thickened type used for emphasis.

Historical consciousness

During the 1840s in Britain, Caslon old-face types began to be revived and recut, for what were at first specifically historical uses: the setting of literary or devotional texts for which a period flavour was appropriate. The taste for Caslon spread to the USA, and elsewhere in Europe there were revivals along the same lines. Thus in France, 'Elzévir' types were recut: though here the Didot modern face was to remain the dominant style. In Britain, old face or old style, as it came to be termed, began from the 1860s to be a generic term and on a par with modern face. These were the two major style categories into which types for continuous text were grouped – 'old english' (blackletter) was another, lesser category – before the emergence of individualized typefaces with trade names. Occasionally in Britain, and more often on the Continent, the category of 'old face' was referred to as 'medieval': a usage that dimly and imprecisely suggested that these letters derived from the early years of printing.

4. See the striking demonstration of this in: Twyman, *Printing 1770–1970*, p. 13.

5. For some evidence of this, see the illustrations in part 2 of Twyman, *Printing 1770–1970*, especially nos. 679, 680.

The growth of an awareness of the history of printing followed from

the larger phenomenon of the emergence of historical consciousness: the progress from informal writings, which retailed and reprocessed anecdotes, to attempts to provide some more objective account. This growing historical awareness is part of the phenomenon of the Enlightenment, and so part also of the modern attitude. Moxon's *Mechanick exercises* set the pattern for the inclusion of a historical component within an essentially practical manual: there confined to his brief remarks, in the preface, on the history of the art. This formula was repeated in the printing manuals, in the major languages, which began to appear from the late eighteenth century onwards, providing a gradually expanding stock of historical knowledge. Fournier's *Manuel typographique* – as projected in its four volumes, and even as published (1764–6) – stands out as a more ambitious combination of theory and practice than was attempted in the works that succeeded it, in France and elsewhere. The next equivalent publication would be De Vinne's *The practice of typography* series (1900–4). But in the manuals and in the occasional purely historical writings (in any language) on printing, the approach remained antiquarian and anecdotal until at least the second half of the nineteenth century: William Blades's *Life and typography of William Caxton* (1861) has been cited as the first work of 'scientific bibliography'.⁶

Composition: mechanization and systematization

While the process of printing is by definition mechanical (the hand-press is a machine), the process of composing type had always been one of assembly by hand, with the aid of a simple gauge: the compositor's stick. With the development of steam-powered printing and with the advent of machines for casting type (notably the Bruce machine), mechanization of composition became the obvious next step for proprietors eager to quicken the flow of work. Some machines for assembling already cast (thus 'cold') type had a limited success – from the middle of the nineteenth century – but the first really effective machines came only in the late 1880s and the 1890s. The breakthrough was achieved by the incorporation of matrices into the machine, casting type as it was needed: line for line (the Linotype) or character for character (the Monotype). The problem of distributing type after printing was bypassed: softer and less durable than founders' type, this 'hot metal' type was simply melted down and reused.

By the later nineteenth century the pace of technical improvement, and of some further systematization of printing, was being forced in the

6. Morison, *Letter forms*, p.67.

USA. Mechanical casting had been developed principally by the Bruce foundry in New York. Both the principal composing machines were of American origin: the Linotype was the invention of a German emigré, Ottmar Mergenthaler; the Monotype, that of Tolbert Lanston of Washington. (Though the Monotype machine was, after its early years, developed primarily by the British branch of the company and took more of the market in Britain than it did in the USA.) An important facilitating device for mechanical composition, a pantographic punchcutting machine, was developed (patented in 1885) by Linn Boyd Benton of Milwaukee: with this machine punches (and thus matrices) could be produced in the numbers necessary for mechanical composition.

It was in the USA also that a standard typographic point was finally agreed and adopted, to become the other principal unit of typographic measurement, beside the Didot point. In 1886 a committee of the US Type Founders' Association adopted the point system (Fournier's of 1764) in place of informal type body nomenclature, but with a unit value that bore no simple relation to any general system of measurement. The unit adopted was that in use in one of the leading foundries, and, as it happened, 996 of these points approximated to 35 cm: an equation, as one commentator has remarked, 'of very limited utility'.⁷ One might imagine that the development of composing machines would have encouraged, if not required, standardization of measurement; and this was their eventual consequence, as they spread to become the usual means of setting type. The US Type Founders' Association moved independently of the makers of the machines just then appearing; though the fact that the American foundries had begun to combine and to agree on standards does seem to have been a response to the threat to them from mechanical composition. In Britain, the new American point began to be adopted by the foundries only after a lag of some years, and in the face of some resistance. The Monotype composing machine had at first its own point system, and only later adopted what now became the Anglo-American point system.

With mechanical composition a new realm of exact calculation was introduced into typography. Monotype composition enjoyed a greater degree of precision than Linotype, which incorporated expanding – and thus not precisely calculable – spaces. But in Monotype, each character and each space was assigned a precise width, expressed as a fraction of the 18-unit-square 'em'. Thus, in principle, compositors could work out the exact location of any element in a layout. If hand setting remained an ultimate in intimacy of control – type could be shaved or tissue paper

⁷. Tracy, *Letters of credit*, p. 25.

inserted – then the Monotype was its best equivalent. And by taking composition out of the hands of the compositor, Monotype was to offer a new scope for distant control of composition by the typographic designers who were to arrive on the scene in the years to come. Such control, desirable in tabular or other non-prose setting, required that the typographer find out the set widths of characters: information not usually published, but available to the determined enquirer.

Investigation and description

As described in chapter 2, the first recorded attempt to test the legibility of text had been conducted by Jean Anisson in the late eighteenth century. Other early isolated expressions of interest or opinion in the matter have been documented, but sustained investigation of legibility did not begin until the end of the nineteenth century. This research was conducted largely by physiologists or by the then newly emerging psychologists, and they approached the matter without the help or the interest of printers. Their research thus suffered from a persistent unreality in what was tested. Much work was done on testing the recognizability of isolated letters – as on an optician's test card – rather than the legibility of words or passages of text. Here the researchers were merely operating under the normal psychological assumptions of their time, and it was only when the general theoretical climate in psychology had changed that legibility could be accepted as the comprehension of meaning: not recognition, but reading. This new approach began to be evident around 1900, for example in the research of E. B. Huey in the USA. In the 1920s in Britain, enlightened work was carried out by the Medical Research Council, and published as a government (HMSO) document in R. L. Pyke's Report on the legibility of print (1926). In its detailed summary of previous research findings and in its official nature, this report has a certain landmark status.

If early legibility research had no effect on the practice of typography, it did nevertheless suggest a possible approach to typography: one that has its own interest, and which would reappear later in the field designated as information design. This may be seen in the work of the ophthalmologist Emil Javal, who published a series of papers on legibility in the 1870s.⁸ Javal wrote from clinical experience, though with no reference to quantified tests, and without any of the inherited assumptions and dispositions of a printer or typographer. He was thus led to conclusions about the forms and treatment of text that violated typographic wisdom,

8. These were gathered and expanded on in Javal's *Physiologie de la lecture*, to which reference is here made.

but which seemed to follow from reason. The project of legibility research raised the prospect of a typography that could do something more than be beautiful: it might be effective. In Javal's work, as in that of other researchers of his time and later, what is effective receives only a limited definition, in terms of the stop-watch and measuring rule. There was no attempt to investigate reading of extended texts or of non-continuous prose, in the circumstances of everyday life. There has been an obsessively utilitarian emphasis in this research: as in Javal's search for 'une typographie compacte', whereby lines of text would be set with minimal space between them, in characters with shortened, non-projecting ascenders and descenders: saving paper and perhaps even metal. 'Effective' thus comes to mean 'cost-effective', for the printer.

Proposals of a similar eccentricity appeared in the course of James Millington's *Are we to read backwards?* (1883), which included some discussion of Javal's work. As his title suggested, Millington toyed with the idea of the boustrophedon arrangement for text matter: alternate lines set in reverse, to make use of the eye's return journey, wasted in normal reading. The pamphlet appeared in a series published by the unorthodox and historicizing printer Andrew Tuer, and thus made some marginal connection with the printing trade. But, after a survey of the field, indicating a fairly wide contemporary debate over legibility, Millington came to common-sense and vague conclusions: type must not be too small, lines not too long, paper not too glossy.

Issues of legibility were given extended treatment in *Typographical printing-surfaces: the technology and mechanism of their production* (1916) by L. A. Legros, an engineer, and J. C. Grant, a novelist. This book, together with the four volumes that comprised T. L. De Vinne's *The practice of typography*, provided a summation of the work of ordering and description that was an achievement of the period. The content of Legros and Grant's book is fairly indicated by its title. *Typographical printing-surfaces* was concerned with the description of the current technics of printing type (though not those of making type by hand), and included extensive historical accounts of machinery. Legibility was treated in terms of the resemblance between single characters: those styles of alphabet whose letters least resembled each other were, it was suggested, most legible. Fraktur alphabets (as a class) were found to be among the least legible, with different characters showing marked formal repetition: thus the common perception of the illegibility of blackletter text was supported by micrometer microscope readings. Legros and Grant did not attempt to

discuss the design of letters from any but a technical viewpoint, nor did they consider the design and configuration of text matter. The book thus separated off matters that would have been thought of as aesthetic. This was not the case with De Vinne, whose work amounted to a total description of typography, with a scope that had no exact precedent.* Other writings of this time should be mentioned: John Southward's *Modern printing* (1898–1900) and the books of C. T. Jacobi. But it was De Vinne who represented the best of the articulate printing trade at the end of the nineteenth century: patient description and ordering of work processes in a time of change; a rational approach to design, which respected the reader and resisted aestheticism.

* See example 7, p.151.