

## **Instructing the printer: what specification tells about typographic designing**

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## Instructing the printer: what specification tells about typographic designing

Specification has until recently defined the work of typographic designing. It has barely been written about, and this essay seeks to repair that absence. Specification emerged with the designer as a new and characteristically modern instrument of control over decisions which once had been made in the workplace. The difficulties to which its exercise could lead are illustrated. Specification – the means by which typographers sought to achieve ‘quality’ – is implicated in the deterioration of compositors’ work experience. But ‘de-skilling’ was more due to managerial decisions about the organization of work, which were made easier by technical changes. Specifications are objects, and they are also communicative acts, acts of language. Their language is considered for what it tells about the social practice of typographic work. While designers may instruct by commanding, they also use the less overtly manipulative linguistic act of declaring. This is because they have always relied on printers to fill the gaps in their knowledge: to secure ‘quality’, they have needed printers’ consent and co-operation. The demise of specification may lead to the de-skilling of designers: as the tools of typographic work become more sophisticated, so that work returns to a pre-modern mode, where both designing and its language become ever more private.

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‘Even Marx insisted, after all, that what distinguishes the worst of architects from the best of bees is that the architect erects structures in the imagination before giving them material form. Changes in the way in which we imagine, think, plan and rationalize are bound to have material consequences.’ (David Harvey, *The condition of postmodernity*, 1990: 115)

‘Mechanical drawing is the alphabet of the engineer. Without this alphabet the workman is merely “a hand”.’ (James Nasmyth, *James Nasmyth, engineer: an autobiography*, 1883: 125)

Much current writing about typographic design is about the surfaces of products or pictures of them. Some writers more sensitive to the grain of designing try to explain the circumstances in which work is done, to recover the intentions of designers, and to imaginatively recreate the balance of constraints and opportunities within which a design job finds shape. From such writing critical history may be built; and Robin Kinross (1992: 144) has memorably described the effort of reason . . . which, in typography, has shown itself in a concern for fundamental issues: the means by which the processes of production can be controlled, the ways in which the needs and desires of readers and users can be incorporated into the shaping of products, the description and ordering of the activity and its materials.

In recent years this effort has been sharpened by two developments. First, the idea of information design with its explicit attempt at a user-centred perspective has prompted some typographers to look further than products as ends in themselves and to ask about outcomes: about the ways in which designed texts are read and used, and the actions which people take as a result of reading and using. Second, there has been typography’s unsteady encounter with computing science. Here I don’t mean typographers’ use of computers in design work (desktop publishing and the rest) – but rather the challenge to offer principled explanations of that work which computing scientists have put to typographers. The confrontation of craft knowledge with formal reasoning and description is an old theme, but still relatively new – only since the 1960s – in typography. Donald Knuth (1982: 5–6) is here speaking about systems for designing typefaces, but his words could equally well refer to the design of texts:

The best way to understand something is to know it so well that you can teach it to a computer. . . . The art of letter design will not be fully understood until it can be explained to a computer; and the process of seeking such explanations will surely be instructive for all concerned. People often find that the knowledge gained



while writing computer programs is far more valuable than the computer's eventual output.

If it was possible to speak without irony about the urgent themes of typography they would be these. Why turn from such pressing issues to the drily technical matter of specification? Some justification seems to be needed for digging in an area of design work which is invisible to readers – specifications are rarely seen by more than a handful of people – and which even for many practising typographers seems increasingly irrelevant.

This essay is a sketch for a study of typographic work. The work which typographers do and the ways in which they do it are worth consideration, and specification claims attention because it has been the immediate and often critical outcome of that work. Seeing typography through the lens of specification captures something of the context in which work is done and of the palpably material activities which constitute it. A study of specification offers a start for a materialist account of designing. This kind of account will stand in hard contrast to the image-based idealism which characterizes much typographic commentary, and which fastens on products – or more likely images of products – as if they arose unproblematically from the intentions of isolated agents. Whatever a designer's intentions, they have finally to be formulated as descriptions about graphic marks, their sizes and positions. And until quite recently, that description took the form of an explanation to other people who would do the work of realization.

These things have not been much written about. As a student I read that 'the typographer was once a skilled interpreter of mechanical constraints . . . now he can be a communicator' (Macdonald-Ross and Smith, 1977: 40). Even then this seemed too comfortable; and later, when employed in a book publisher's office, it was at the back of my mind as I wrote in a review (Stiff, 1981) that 'The thoughtful designer may perform little more than a remedial function, anticipating the forced lapses of copy-editors who are restricted to ever-more superficial procedures, ameliorating the worst excesses of typesetters who have forgotten . . . the norms of text composition. This, let alone wage slavery and job insecurity, may describe the daily experience of employed book designers.'

One deficiency of this essay will quickly become clear: it is based almost entirely upon evidence from the British printing and typographic trades. Traditions of typographic training and education in, for example, German-language countries may have resulted in different working relations between printers and designers, and consequently to different approaches to specification.<sup>1</sup> I await corrections from colleagues who can offer evidence for or against this supposition. And in what follows I have been shamelessly eclectic in my use of sources and evidence. Writing about typographic designing may have to be like this until typography – as an object of enquiry as well as an activity – can claim its own critical perspectives. Typographers who

1. One index of difference could be the absence in Britain of anything comparable to H.-R. Bosshard's *Technische Grundlagen zur*

*Satzherstellung* (1980) published in Bern by and for compositors and printers. For a review see Kinross, 1991.

do-it-themselves have to borrow tools where they can. So the construction which follows is by turns as informal and anecdotal as occasion demands. While I freely admit the limitations inherent in this medley, there seems no further reason to apologize: one has to begin somewhere.

### 1 Designing entails specifying

Before saying why specification is worth writing about, I first say what it is, and this begins with a view of design as forming an intention and planning its realization. Simply put, specification describes the designer's intention in such a way that it can be realized. What designers make is a specification: its implementation, and so the realization of the designer's intention, has normally been done by other people. When design is practised within an industrial process, specification is the end product of the designer's work: it is what leads to manufacture. As Norman Potter (1980: 19–20) puts it, 'designers work and communicate indirectly, and their creative work finally takes the form of instructions to contractors, manufacturers, and other executants'. And likewise Stanley Rice (1978: 1) opens his account of book design by describing the designer as a 'specifications bridge between the publisher and the manufacturer'.

Specification distinguishes designers from craft workers. The craft worker's intention is not usually verbalized or otherwise symbolically represented, such as by drawing. In designing, by contrast, drawing is done for many reasons, not all of them to do with specification. But one reason why designers draw is to specify. The simplicity of this contrast is complicated by the fact that printing was the first modern mass-production industry, and design for printing can reasonably be seen as an industrial craft.<sup>2</sup> So we could tentatively rough out a continuum of 'craftness', and see that the place occupied by typographic design is determined largely by the viewer's position. For example, computing scientists who work with typographers and ask them about what they know, how they know that they know it, and how they express it, will get answers which suggest to them that typography is a craft because of the kind of knowledge that typographers acquire and produce. That knowledge is not formally stated, is given to aphoristic expression, and is in this sense relatively inarticulate. It is got through a form of apprenticeship and is passed on more or less intact from one generation of practitioners to the next. On the other hand, from the position of a cabinet maker or a silversmith, typographers look like industrial designers because of their position in the relations of production within which typographic designing is done. That position may be both precarious and ambiguous. (The typographic designer is the agent of the printer's customer, who pays the printer's bill. When designers instruct printers, they do so on behalf of the printer's customer. This may look straightforward enough, but its working out in practice has often been difficult and tense.) But it is obvious to craft workers that typographers rarely make anything: what they do is specify to other people the assembly of prefabricated components. To the workers who receive specifications, typographers may look like middle management, or their agents. They are mediators and, as we shall see,

2. The sub-title of Hugh Williamson's *Methods of book design* is 'The practice of an industrial craft'.

their work itself is mediated, in contrast to the immediacy – the ‘direct manipulation’ – of craft.

Design within an industrial process has entailed design by drawing, which results in a specification, the existence of which expresses the separation of designing from making. It also registers the entrance into manufacture of a separate agent: the reason for the designer is to make specifications. There is a price to pay for this entrance: it is, in J. C. Jones’s words, ‘to take away much of the intellectual difficulty and fun from manufacture and give them to a new class of persons who make the drawings’ (Jones, 1992: 22). This is a theme which will re-occur.<sup>3</sup> But already I am moving ahead too quickly. First, more needs to be said about what a specification is for.

A specification is an act of communication: a message from the designer to the people who implement the specification and so do the work of manufacture. A specification is about something; it describes what is wanted – the intended result and perhaps also, and more controversially, what should be done to achieve that result. The designer describes an intention; the executant interprets that description and does something: takes actions which aim to realize as closely as possible that intention. So specifying may sound like commanding, and that too is controversial. Specifying can also be considered as an act of language in a social context of unequal power. There will be more about this later.

This essay is about typographic specification, and I use that term in the deliberately limited sense of purposefully describing, in a form designed for other people to use, the visual arrangement of text on the surface of documents (usually those printed on paper, though in principle including electronic documents displayed on screens). Putting it simply, the description is about getting the right characters in the right sizes in the right places. Here rightness refers to exactness, or at least fidelity to the specification within an agreed tolerance. So rightness is determined by objective rather than value judgements, and conforms with what may be loosely regarded as an engineer’s view of ‘quality’. In traditional practice the specification set limits within which people worked, while in present-day electronic publishing environments the purpose of a specification is to control the behaviour of a formatting system. And mention of electronic publishing straightaway leads me to say that typographers work on actual rather than virtual texts, which always exist as ‘hard copy’ rather than solely in machine readable form. An actual text always has a graphic state – sometimes still called ‘copy’ – which arises from work done by an author.<sup>4</sup> The typographer intends to translate it into some other graphic state, and the specification describes the nature of that intended translation.

3. Jones (1992: 23) also says that ‘the drawing has the critical weakness of not conveying anything about the needs of users or about the problems of manufacture’. Here he must be thinking of drawing as a tool for envisioning a solution to a design problem. In typog-

graphy a specification drawing which was not framed in response to the envisaged needs of manufacturers would be worthless.

4. ‘Copy’ is a word now largely devalued by graphic designers, who use it just to mean ‘the words not the pictures’ – as, for example,

in Erik Spiekermann’s (1993) recent typographic primer. Hugh Williamson (1983: 370) has ‘that version of the text which the printer copies when he sets type’.

## 2 Writing about specification

Specifications are written but specification is not much written about: the subject is almost absent in the literature of typography, although it gets a better hearing in fields such as architecture and product design. So let me now say why specification is worth writing about. It might be assumed that there is a clear connection between good specification, good designing, and good products of designing. If a designer takes great effort in planning the shape of a product, then that effort is likely to be matched by a correspondingly great attention to specification. For example George Mackie (1988: 158) recalls the 'early days of my efforts to achieve printed results which were not too embarrassingly different from the designs which I thought I had worked out to the last detail on the drawing board'. It may be inferred that good specification might be seen as a mark of designers' commitment to the quality of the product which they design.

But there are obvious objections to this assumption. First, an accurate and clear specification is no warrant for the validity of the intentions which it describes. A good specification may make something easier to make, but not necessarily worth making in the way it describes. Second, a poorly specified job can be salvaged, at least at the level of detail, by the technicians who in implementing the specification do invisible mending. And third, some design jobs can be largely unspecified: the designer can simply rely on the competence of workers, and specification – at least in a formal sense – is not necessary because the workers know what is needed and how to achieve it.

This is why Stanley Rice (1978: 12) made

the well-known point that the designer does not need to specify everything in detail, and the not-so-well publicized point that the designer who leaves a lot to the compositor may seem very competent without having much right to.

Allowing for these objections, it is still likely that a good specification will be taken by the people who have to act upon it as an index of the professional and technical competence of its author. This is important, since confidence in the reliability of the person who issues instructions is not lightly assumed by the people who receive them. And this in turn points to the social and material character of designing. It is a reminder that typographic designing is not wholly explicable in terms of aesthetic disposition, of the pursuit of good form, of fluency in 'graphic language', or of skills in practical rhetoric. It reminds us that typographers' material work involves them in negotiating and often in making compromises; only afterwards can things be made. Design for manufacture is necessarily collaborative, and it is worth saying that some socially minded designers believe that at best it is a cooperative venture. This acknowledgement can go too far – to an idealization which neglects differences in the interests, privileges, and positions of designers and makers.

A specification is the result of a kind of information design. It could be likened to an operators' manual in the sense that it guides actions at work. But that similarity may not stretch far, since a typographic specification – unlike a manual for a word processing program or a knitting pattern – is not usually a precise procedural description of what must be done to achieve a desired result. A softer comparison would be with

a guide book: but too soft, since tourists and walkers can choose their own objectives, while implementers of specifications normally have to work within very limited tolerances. So these comparisons cannot be pressed hard. If designing a specification is a kind of information design, then it is design for a small and known audience – known in the sense that its needs are known or can in principle be known. And it is certainly ‘private’ rather than public information design.

Finally, and if these reasons are not enough, specification may be worth writing about just because it is passing away. What has been the defining attribute of typographic design during its short life as an independent practice at least merits a notice at the moment of its apparent demise.

### 3 Specification and the modernization of typographic work

Typographic specification has not always been needed. Although a book like *Copy and print in The Netherlands* (Hellings, 1962) shows that specifications have been around in one form or another since the beginning of printing, most printers, for most of the time, have managed without them. Why? The simple answer is that specification in the modern sense has been practised for as long as there have been professional typographers – that is, not very long, say since the 1920s. Until then typographic designing was done by printers. Now most typography is probably done in the office (and this may have been so since typewriters): at the keyboards of microcomputers running word-processing and other software. Then there is another answer, longer and more complex, still to be written about convention in typography.

Richard Hollis (1994: 4) has summarized the history of graphic design as ‘the history of the designer taking control of the craftsman’s process’. This, in nutshell, describes the modernization of a trade. It occurred later in printing than in some other industries within which designers emerged to take over the decisions which had once been made by skilled workmen. An account of this modernization could be inscribed within a larger history: one of processes of destruction and reconstruction of workers’ skills in response to changing markets, of the fragmentation and reorganization of work under changing regimes of capital mobilization and accumulation. These processes have undoubtedly accelerated since the early 1970s.<sup>5</sup> But individuals may not find it easy to see or explain such a larger history as they live through it. What they do see and try to account for are changing patterns of their daily work, and shifting local accommodations to the people with whom they work.

The process of modernization is double-edged, at once both creative and destructive. By reconfiguring and demystifying the processes of production, it opens up manufacture to new creative energies. At the same moment, it splits off manual from mental work; people who are the direct producers of things find that the space to use their intelligence in work is fragmented and limited. In other words, modernization takes decisions about processes and materials from the hands of craft workers and relocates them in the offices of managers and designers who make specifications. Eugene Ferguson (1993: 102) has written of the transformation which occurred in most European

5. For this larger history, see David Harvey’s *The condition of postmodernity* (1990), especially part 2.

and American engineering workshops in the first half of the nineteenth century; that change was

from a world in which engineers negotiated with workers who had traditionally used the judgment of their trades to a world in which matters of judgment were settled by pencils and paper in drafting rooms remote from the shop floor. The removal of all discretionary power was neither sudden nor uncontested, but within a few decades the center of authority in engineering work was clearly located in engineering drawings.

In printing a comparable shift in the place of typographic decision-making – from the shop floor to the designer's office – occurred a century later, and was probably not settled until after the Second World War. In 1945 Beatrice Warde (1955: 67) reckoned that 'the divorce between the designer-specifier and entrepreneur which took place in building some centuries ago and created the professional architect is only now beginning to take place in printing.' Before the war Oliver Simon (Simon and Rodenberg, 1928: 11) – who had taken the gentleman's path into typography – spun a military metaphor to invoke the threat he perceived to aesthetic quality:

one factor, perhaps more than any other, has made the Typographer necessary in England if English printing is to have a future. I refer to the Trade Unions. . . . Each process of printing has its well-drilled, massed, but exclusive and watertight compartments of workers, helpless and unorganized to achieve printing results of any aesthetic value without the Typographer to watch, guide, and lead them.

The specification embodies the designer's invasion of the worker's space for decision-making; considered as a new instrument of control over workplace decisions, one would expect it to be a place of contest. And, indeed, the running of that contest explains the presence of a tension in commentaries on the work of designers and printers. In 1928 Stanley Morison could be heard grinding an axe before a meeting of the British Federation of Master Printers: 'people in publishing and publicity have lost faith in the printer. They do not believe that he has intelligence enough or resourcefulness enough, or brains, types or anything else of value to them. . . . Printers have become hewers of wood and drawers of water' (Barker, 1972: 231). On the other side J. R. Riddell, then head of the London School of Printing, held that 'artists should be kept in their place, and he had all the technician's resentment when they (in the form of 'typographical consultants') strayed into the printer's preserve' (Barker, 1972: 232). And Moran (1978: 11) cites a publicity manager's address to the British Typographers' Guild in 1931: 'A printer's representative calls . . . and asks me to let him handle some of our work. When I ask him if his firm employs a good typographer, he looks blank and answers that they employ a good foreman-compositor, and implies that I am a crank for asking for the services of a typographer.'

Not many of the people whose work has involved them as participants in, or observers of, the history of typographic work in Britain over the past fifty or so years have publicly written or spoken about the changing conditions of that work. In this section I gather together the words of some of those who have done. Among them Beatrice Warde's voice is prominent, and her position was exceptional: as the Monotype

Corporation's publicity manager she spoke on behalf of its customers in the printing trade, robustly defending the domain of craft skills and the compositor's space for decision-making against the encroachment of ill-informed outsiders – 'layout men' who had never worked in a printing office. In 1945 she spoke of 'this crisis in printing . . . when the agent-designer is beginning to elbow in between printer and customer' (Warde, 1955: 90). Her conviction was that a 'typographic reformation' (which she partly invented by energetically promoting) could be effected by educating the trade in typography and so by raising standards from within. The hope was not fulfilled: with a few exceptions the trade lagged behind the outsiders, and the layout people were probably a more enthusiastic audience than printers for the informal education in typography provided by Monotype's publicity office. This was a minor effect rather than a cause of the apparently inexorable loss by printers of their control over typographic designing.

Warde (1952: 26) quickly got to the heart of the difficulty in relations between designers and printers, which in 1952 she characteristically called 'the problem of etiquette':

whereas it is always proper and helpful to show a craftsman *what effect* one wants, it is improper and thoroughly bad manners to offer to show him *how to obtain* that effect . . . . The working layout which indicates just where to put the hair spaces in a line of caps for optically even spacing, just how much leading to put here and there, just what point size to use, and so on, assume that the compositor has not yet learned the rudiments of good composing style and must be told. [emphasis in original]

This needs a context. Just a few years earlier Jan Tschichold, working at Penguin Books and so dealing with most of the biggest book printers in Britain, had found it necessary to have made a rubber stamp with the legend 'optically even spacing' to use in marking proofs for correction.<sup>6</sup> Could Beatrice Warde, so close to the trade, have failed to recognize what was signalled by Tschichold's device? More likely she chose to ignore it, preferring to imagine as still normal the kind of working relationship between typographers and printers which she had learned from the examples of Stanley Morison and Francis Meynell: 'Where only one printer was concerned, it would always be possible first to establish or confirm principles of good composing style . . . and then to draw up rough sketch layouts with no officious little pencil strokes for every detail.' But, allowing that there might be occasional exceptions to this norm, she went on to qualify: the precisely detailed 'working layout' should be reserved 'for those rare occasions when it would be genuinely needed: e.g. standardizations of forms, etc. to be set by different printing houses with different house styles' (Warde, 1952: 26).

The common language of well-understood conventions spoken at or close to the workplace of manufacture allowed typographers such as Morison and Meynell to use the skills of the craftsmen at Cambridge University Press much as the 'new typographers' would later use specification forms, composition rules, and precise layouts. Here is Meynell (1971: 163):

My experiments in type arrangements too cost us . . . a great deal. . . . I made and scrapped twenty variants of the title-page for Montaigne. And either William Maxwell . . . or Walter Lewis . . .

6. McLean (1975: 145) is the source for this. Hans Schmoller (1990: 18) later described Tschichold as becoming 'in the modern sense an industrial designer, directing the work of others from a drawing board or desk.'



said that he always lost money on the text of a Nonesuch book, but made enough on the trial pages to see him right.<sup>7</sup>

The typographic tradition which Morison invoked as ‘the embodiment of the common sense of the generations’ lay in the hands of printers and editors, finding verbal expression in aphoristic forms which in turn expressed ‘well-trying, well-reasoned principles of text construction whose survival would depend on their effectiveness in practical situations’.<sup>8</sup> Thus Brooke Crutchley (1976: 305), described the design and production of books at Cambridge in the 1950s: ‘because everyone working at the Press knew how to deal with typographical detail and elaborate instructions were unnecessary, it was possible for one full-time designer and five or six copy-editors . . . to deal with two hundred books and as many journal issues in a year’. But it is unlikely that such settled confidence flourished outside the university presses and a handful of trade printers who supplied them.

The charm of an imagined workplace, one which organically combined the collegiate spirit of the office upstairs with the solid reliability of the workshop below, has all the potent appeal of an age just passed. When George Mackie (1991: 20) admired the products of the Nonesuch Press, he may also have imagined that close working relationship with printers which Warde took to be normal:

Meynell found the book printing industry in Britain at a peak in workmanship and materials. I do not suppose he ever felt obliged to make exact typographical layouts. A loose indication of what he had in mind would be followed by specimen pages, followed by revisions or alternative settings.

And in this account of Updike’s collaboration with John Bianchi, the way such work might have been done is described in more detail:<sup>9</sup>

a specimen text page . . . [was] first set up. Updike usually did the layout of such pages, but as neither man could draw, layouts were neither sketched nor traced. The outline of the type page was ruled on a sketch representing the final page size of the book. This indicated the area of the type and the margins. Directions as to size and face of type, leading, running heads, and folio as well as any unusual details were marked on the layout. A selected portion of the manuscript accompanied the layout to the composing room . . . . Updike would attend to the careful and more subtle spacing and leading of the sample pages when he saw proof, and successive proofs were always required to obtain a result satisfactory to both men.

It is hard to know whether such a close working relationship between designer and printer was ever usual. But it is a reminder that closeness in the to-and-fro of work, with each move in the design process played out face-to-face and quickly realized in proofs, required the physical presence of each of the participants. By contrast Mackie (1991: 20) refers to his work as ‘industrial typography’:

The manuscript for a complex academic book . . . has to be detailed in unambiguous technical terms in such a way that workmen from a series of separate trades can carry out the instructions competently, without the need for expensive revisions. The greater the fragmentation of the printing industry, the more necessary the typographer becomes.

Two approaches to specification are evident here: on the one hand the light touch, a loose and relatively non-technical indication of the

7. Meynell, who set up the Nonesuch Press late in 1922, here refers to William Maxwell of the printers R. & R. Clark, Edinburgh, and to Walter Lewis, who preceded Brooke Crutchley as University Printer in Cambridge.

8. Here I quote Robert Waller’s words, but both he and I are unable to locate the printed source.

9. The account is Daniel Bianchi’s, and this passage from *D. B. Updike & John Bianchi: a note on their association* (1965, Boston: The Society of Printers) is cited by John Dreyfus in Dreyfus and Baudin, 1972: 21.



designer's intentions which left much to the compositor's judgement; and on the other the professional's specification, a precise description of particulars, which left little. The difference is only partially explained by personal style. It arises more from changes in the circumstances of work which were largely beyond the control of individuals. First, there were changes in the scale of design tasks: from designing a few items to be made by one printer to designing many different items, to be made by several printers. Then there were changes in the organization of manufacture: from printers which offered the full range of trade skills and services under one roof to fragmented and dispersed suppliers of separate components. And there was greater distance between printer and designer.<sup>10</sup> This meant greater physical distance: the composing room was no longer downstairs but two hundred miles away, so letters and telephone calls replaced face-to-face conversations. It also meant, consequently, less personal contact between designers and printers; and with the loss of acquaintanceship and familiarity came loss of confidence about what one should and could expect of the other. Hans Schmoller acknowledged much of this in answering a question asked by a student;<sup>11</sup> the question was: 'Should a typographer always make layouts and specifications that leave nothing for the printer to decide?' His answer referred to the 'difference between making layouts for people you know (proverbial back of envelope) and for the "printer-contractor".' For Schmoller, following Tschichold at Penguin, long-distance specification meant tireless attention to detail: the typographer must 'harden his heart against the accusation of being too fussy', because 'to him, one typographical point must be as important as one inch' (Schmoller, 1951: 36). The circumstances of work which Beatrice Warde imagined as exceptional were becoming normal for many typographers.

It should be added that many designers read, as written implicitly into every client's brief, a charge upon them to do their work economically – without the costs incurred by second thoughts or prevarication. This arose from a redistribution of the client's investment: if it was to be reduced at the point of manufacture – by eliminating stages of successive proofing – then it must be made earlier, in the design stage. Specification was the point at which economies could be made. The Scottish typographer George Mackie (1991: 29) described his layouts for Edinburgh University Press's printers in just this way:

Each one left nothing to chance, and was made as realistic as possible to allow me . . . to make sure it would succeed in print, without any need for revisions or second thoughts.

So there is more to be said about Warde's distinction between indicating 'what effect one wants' and instructing the printer 'how to obtain that effect'. Most obviously, consider the decisions she reserves for the compositor: 'where to put the hair spaces in a line of caps for optically even spacing, just how much leading to put here and there, just what point size to use'. The first is the charge of Tschichold's device, though its implementation was left to the compositor.<sup>12</sup> The last two are part of what have been called the 'set-up parameters' – the handful of basic parameters which need to be established before typesetting can begin.<sup>13</sup> It is inconceivable that present-day typographers (or any in the past few decades) would delegate these decisions to a

10. John Dreyfus and Fernand Baudin (1972) surveyed typographers' 'layouts' and reported (pp. 1–2) that: 'Brief verbal or written instructions are given in many cases. In others, careful briefing and meticulous layouts are necessary.' They speculated that 'What finally determines the method depends as much on the nature of the work, as on the physical and mental gap which separates those who make a layout from those who carry it out.'

11. The exchange occurred during a seminar at the Department of Typography & Graphic Communication, The University of Reading, in 1979. It is recorded in notes which Hans Schmoller made prior to the event, and which are now held in a Departmental archive.

12. Of course, the stamp could not say just where to insert extra spaces; and we do not know if Tschichold further marked proofs with more precise instructions. The point is that he routinely felt it necessary to draw the attention of compositors to the need for letterspacing.

13. Linotype (1987: 4–1) refers to 'the four basic parameters for setting type: measure, leading, point size, and font.'

compositor. They are more likely to assume that the point of Warde's distinction was, instead, to insist that the designer had no business in instructing the printer in what Hugh Williamson described as 'details of operational method'.<sup>14</sup>

'Operational method' is open to interpretation. Here it can mean how compositors' work is organized in a particular printing company – who does what, and how, and to what standards, and under whose orders. Or it can mean, much more generally, the sort of work that all compositors do and how, as part of that work, they might be assumed to read, interpret, and implement specifications. Many typographers, and especially those who have learnt their skills outside the printing trade, have never had the opportunity to discover much about this. If they had, they may have been better equipped to design specifications that were acceptable to and usable by compositors.

Printing companies could justify concealing from outsiders details of their internal operational methods on grounds of commercial confidentiality. That concealment is of course also a memorial token of the secrecy ('the mystery', inscribed on apprentices' indentures) veiling the 'black art'. But in education mysteries are to be revealed. So when specification has been taught with some seriousness it has involved teaching student typographers that typesetting systems which have different typographic capabilities require specifications which differ considerably in detail.

Knowing about such things was, for some typographers, a matter of professional self-respect. But finding out what the systems could be made to do, and just what information compositors needed to have from designers, was often a thankless and frustrating task during the bleakest years of photocomposition – say from the early 1970s to the mid 1980s. (There is more about this in section 4 below.) What most designers did, and what most printers accepted without demur, was to specify for photocomposition systems as if they were hot-metal typesetting machines, leaving it to the composing room manager to make the conversions. As Stanley Rice (1978: 46) observed, 'most of the new machines are incompetently and even badly used, and may end up functioning like ... the last machine most designers thought they could understand without help.' Shared ignorance – cock-up rather than conspiracy – prevented most designers from achieving anything like exactness in their intentions or confidence in their expectations.

In 1979 the Department of Typography & Graphic Communication at Reading University set up a working group to survey the teaching of specification. Notes from one of its meetings show an affinity with Beatrice Warde's earlier articulation of the trade's position:<sup>15</sup>

a specification should be more of a description of the desired result than an instruction as to how to achieve it. The implementers will do their job in their own way. Precise instructions from the designer are usually inappropriate.

Here is a banal example: students might have been taught, when specifying for hot-metal composition, that '10/12' (or some comparable notation) was an adequate description of a desired result (10 point type size, 12 point interlinear space). They should then leave it for the printer to decide whether the spacing should be achieved by 2 points of leading or by casting the 10 point face on a 12 point body. This

14. 'The book designer relies ... on a technician's knowledge of a variety of processes and materials, though not necessarily on details of operational method' (Williamson 1983: 354).

15. The notes cited here were made by Robin Kinross; the meetings took place between 1979 and 1981.

advice made sense for beginners: only typographers with experience and some clout could step into the operations room, as Hans Schmoller did with a remark such as this, written on a revised specification: 'Footnotes must always be 1 pt leaded, and as they are very frequently shown set solid on the proofs, it would surely be best to cast them from the outset on a body which incorporates the leading.'<sup>16</sup>

In 1968 Maurice Goldring briskly entered that domain of printers' operational methods in a brief article entitled 'The functional relationship between typographers and keyboard operators'. The title says what he was aiming at;<sup>17</sup> and the article's context – what was then called 'computer composition' – provided the motivation to do so. The functional relationship to which he referred arose 'from how the typographer specifies and marks up a job for the keyboard operator'; and he observed that typographers had no standard way of doing that (p. 8). He asked some provocative questions, including this one: 'If the keyboard . . . has operational symbols on the keys, should these symbols be used by the typographer in his specification and mark-up?' But he did not spell out the consequences of a 'yes' answer: the resulting specification would effectively amount to instructing the compositor to 'press these keys in this order'. And this would mean that the typographer had become, in effect, the compositor's line manager.

Goldring prefaced and ended his article with conciliatory notes: 'the detailed typographical knowledge and skills of the keyboard operator should be fully recognized by the typographer'; and the point of 'liaison between typographers and keyboard operators' was to help them to 'work in harmony, respecting the particular experience, knowledge, and skills which each possesses'. But however generously felt, expressions of goodwill could not alter the changed balance of control. Twenty-five years earlier, Beatrice Warde (1955: 108) had spoken of the fate of the craft compositor: 'the fate of being turned from a responsible type-mason into an obedient "hod-carrier" for the layout man'. Realizing that the compositor had lost, she urged designers to at least show a measure of the 'diplomacy which is proper in dealing with men of high skill and old tradition' (1952: 23). And the art schools, where the 'non-trade typographic designer' was taught, should 'build in him a profound respect for compositors, a habit of respect that will be invaluable to him when the time comes for him to command their respect as the co-ordinator of the whole job' (1955: 72).

Warde had an interest in defending the trade against outsiders. But it is hard to hear these words as merely axe-grinding in Fetter Lane, and likewise when she spoke of

reducing the compositor to that state in which any fault of judgement seems to be excused by the cry 'I never had any instructions about that'. The conventional retort, 'Why don't you use your head?' must never lose its sting – as it is bound to do when everyone knows that the speaker never meant to give the craftsman the slightest opportunity to 'use his head'.

And she pushed harder, saying that designers should be made to picture the faces of the craftsmen who have just received a minutely marked layout from some unknown expert who evidently intends to have his own way down to the last hair space. [They] can be made to see the face of the apprentice too, as the

16. In a revised specification of c. 1950, in the 'Pevsner – Buildings of England' file of Hans Schmoller's work, now in the Department of Typography & Graphic Communication, The University of Reading.

17. The title promises more than the text delivers on that subject – it is mainly a call for standardization. See also pages 43–4 below.

lad asks himself whether he should bother to attend his layout class that night. Who's going to care what he thinks about layout?

Responses to all this may depend on what else is recalled of Beatrice Warde's dispositions; her view, for example, of 'real' book readers as members of 'a relatively small élite . . . distinguished by their ability to concentrate continuously on one fairly long piece of reading matter' (1955: 40). It may be reckoned as condescending or, more leniently, read as a music hall stunt or an Ealing Studios script. But if the pungent sentimentality of the words is discounted it may be easier to respond to her attempt at invoking sympathetic fellow-feeling, and to sense also that it was of a piece with the times: the post-War settlement in which most people would still have to know or re-learn their place. Something of that kind of generous sympathy may have led to the pangs which George Mackie records (1988: 160): 'I was treating the comp as an unthinking and unfeeling artisan, and not as a sentient and creative individual.'<sup>18</sup>

The changing relationship between designers and printers can be read in terms of structural changes in work which were largely beyond the control of individuals. But to rely exclusively on structural explanations would be over-deterministic, since it would discount the space for ideas. That space might be small for designers and barely marginal for compositors, but it is where intentions are born. Ideas about the nature of work, about design as a navigation between order and freedom, could lead to intentions about the space between letters. So Robin Kinross (1992: 117) describes Anthony Froshaug's move to Cornwall in 1949, where workshop printing could be 'the way out of the problem of trade compositors failing to follow layouts, however precisely drawn and annotated'. And he plausibly suggests (p. 118) that 'a new typography depended for its success on an exactness of execution that was less necessary for traditional work', instancing the difficulty of unjustified setting, which arose from 'the need for unjustified setting to be elaborately specified, in terms of a given word space and treatment of word breaks; while justified setting can be understood and accomplished without further explanation'.<sup>19</sup>

Alan Marshall (1993: 5) recently offered a corrective to nostalgia about trade skills and typographic quality; referring to 'the generally abysmal quality of a sizeable section of the printing industry', he observed that: 'it is pure wishful thinking to imagine that the printing fraternity as a whole has ever been the guarantor of typographical quality.' This realism can be welcomed without at the same time discounting the expert skills of some compositors. The expert compositor's intention is explained partly by Richard Southall's (1992: 284) observation about 'rules of composition', which are intended to aid the reader's comprehension of a text by preventing the occurrence of inappropriate visual features in its realization. This is the objective which underlies all the recommendations in the compositors' manuals, even when these seem at first sight to have only an aesthetic justification.

In fact, the good compositor's intention was more than simply preventive – the aim was to be positively helpful to the reader.<sup>20</sup>

Part of most printers' stock in trade are tales of incompetent specifications. By the same token few typographers would be unable to recall

18. George Mackie is a Scot; the English may have been less sensitive on this score, being over-familiar with those routinized national inflections to the grammar of class relations, spoken and heard all the way from workplaces to sports fields.

19. Ken Garland (letter to the author, 5 July 1994) recalls a conversation with Beatrice Warde in which she referred to unjustified setting as 'twerpography'.

20. For a compositor's account, see Mick Stocks's explanation of how high quality results were achieved in unjustified typesetting (in Stiff, 1996: 144–6).

instances of printers mystifyingly unresponsive to careful specifications, atavistically slipping into unreconstructed pica-thumping.<sup>21</sup> Ken Garland recalls the 1950s, when ‘people like me were interlopers. When compositors deigned to discuss specification with me . . . they muttered incomprehensible phrases, using jargon wherever possible. They talked of ‘nuts’ and ‘muttons’ . . . of ‘thins’ and ‘thicks’. Worse, their terms were ambiguous: when they spoke of ‘ems’, they sometimes meant pica ems, but at other times they meant em of the point size of the text face in question.’<sup>22</sup> And for pursuers of ‘quality’, the trade’s typographic standards were often just not good enough. So the implicit point made by Herbert Spencer’s *Design in business printing* in 1952 (especially in its ‘before and after’ illustrations) was that printers’ traditional solutions were inefficient, uneconomic, and clumsy, and that designers should take control through specification.

Typographers did take control, and paid a price. For some – perhaps only for those who read Ruskin or Morris – the price was measured in moments of unease. Here is George Mackie (1991: 29) again:

I have had an occasional qualm that I was part of the disintegration [of the printing industry] . . . I wondered about Ruskin and his faith in the creativity lying fallow in workmen. I treated them not as skilled men but as skilled hands, literally, not metaphorically. I expected my layouts, explicit and detailed in every way, to be followed exactly.

The loss of potential cooperation was a still harder price to pay. The new professional typographers could not count on the tacit support of printers which had been essential to the success of the gentlemanly light touch. Warde (1955: 110) conjures up ‘the effect of too-frequent hectoring by detailed layouts’:

The compositor knows only that he will lose time if he starts ‘using his head’, but also that he might be letting the House in for costly non-chargeable corrections if he guesses wrong . . . Better play safe. And so the vicious circle goes into full swing, as the . . . customer finds himself expected to lay down the law on style by more and more explicit layouts – which make the craftsmen more and more dependent on such help.

There is testimony from the printing shop to support this. Cliff Morris has a good memory of the first specification he saw (around 1949) since he had never come across one before: ‘it was a layout drawn on tracing paper with typefaces and sizes marked down the side’.<sup>23</sup> He wryly described the resentment of compositors when presented with layouts: ‘it was insulting to be told what to do by people who obviously didn’t know much about the work that compositors had to do, and who didn’t appear to know their own job.’ A compositor ‘could tell, at a glance, that the line of text marked for setting in 12 point capitals would never fit in the 20 pica measure which had also been marked; so the comp would just increase the measure, to 24 or 28 picas or whatever, and set the line in 12 point capitals, even if that line went right off the page.’ So the compositors made a point of following the layout: ‘if we were told what to do, we’d do what we were told, and nothing more – you didn’t use your initiative.’

The resentment described here, and the understandable response to it, are typical examples of what comfortable press columnists would later take relish in demonizing as ‘bloody-mindedness’. But that

21. The term is Henry Lewis Bullen’s, reported by Beatrice Warde: ‘You know I always tried to tell the lads, “If you’re going to be a pica-thumper you might as well have been a plumber, they use lead too”’ (Warde, 1970: 7).

22. Letter to the author, 5 July 1994.

23. Cliff Morris was printer (head printer from 1972) at the Department of Typography & Graphic Communication, University of Reading, from 1949 to 1989. His observations arise from a conversation with the author in February 1994; in this paragraph the quoted words are his.

phrase of Beatrice Warde's – about the compositor 'using his head' – still echoes down the generations. Here is Hugh Williamson in 1981:<sup>24</sup>

The managers of our keyboard and computer-typesetter rooms . . . remarked to me that it was the first [copy] they had seen from a customer which was marked up as for photocomposition. Most of the copy they get is marked up as for metal type. . . . They made the point that when they see anything as carefully prepared as this, they form the intention to do exactly as they are told, and the proof you get from them is intended to be an exact response to your instructions. What we usually send out is our interpretation of the customer's instructions, and our kind of translation of the result into type. So you have earned congratulations of a kind which are all too rare; but I hope after sending such precise instructions you will not expect the printer to use his loaf in the way he normally has to.

The sting in the tail hardly needs further emphasis.

In such ways some typographers have learnt quite sharply the double-edged lessons of modernization. They had been taught by master practitioners to demonstrate 'unrelenting care and mastery of detail';<sup>25</sup> this was the route to 'quality', to excellence in typographic work. But they were left to discover for themselves just where in the process of designing these attributes of care and mastery were to be exercised. The point at which they developed intentions was too early, because the sketchy and personal notation which they used at that stage of designing was not readily interpretable by compositors. And the point of production was too late, because clients would no longer pay for designing in proof. The only place was the point at which the formulated intention was described: that is, at the point of specification – in and through the instrument of control.

So typographers were left to use their heads alone. There were, and are still, no recognized professional structures – no open channels of discussion and negotiation – through which they could speak directly with compositors. The most that conscientious typographers could do to enrich the quality of work was to take, when the chance arose, whatever personal initiatives might encourage good working relationships with printers. But this was chancy, unreliable, and unpredictable. A necessary condition of typographic 'quality' may be a degree of mutuality, a space within which both designers and printers could use their heads together.

#### 4 Bleak years: the de-skilling of compositors' work

Typesetting was once the work of a skilled trade in light industry, and it was male work. H.O. Smith (1988: 37) described the typesetting operations of Butler and Tanner, a book printing company which he knew well, in the late 1940s: 'a hand composing room about half the size of a football field, backed up by a Monotype department of about twenty-five keyboards and a similar number of casters'. Within thirty years such typesetting factories were all but finished in Britain. The first signs of change came in the 1960s with 'direct impression' composing – electric typewriters adapted for text composition, and often operated by women. The technologies of computer-based phototypesetting offered greater managerial opportunities: these were first seized by regional newspaper proprietors, and later by periodical and

24. Letter to the author, 29 June 1981. Some of the materials which provoked this can be seen in figure 6 on page 50.

25. The phrase is Hugh Williamson's (1983: 354).



26. Harry Smith (1988: 84) records that when he joined Crosfield Electronics in 1961 there were about twenty-five 'keyboard-operated phototypesetting systems' in commercial use in Great Britain; the number had risen to about 230 by 1970, and to over 10,000 by 1987. Lawrence Wallis (letter to the author, 20 July 1995) confirms the accuracy of these figures, suggesting that 'the total number of phototypesetter/imagesetter machines installed in Britain currently probably reaches some 12,000 to 13,000 . . . [and] the zenith of hot-metal probably saw some 10,000 linecasters operational in this country alongside some 3,500 Monotype casters.'

27. Goldthorp was addressing the Institute of Printing, most of whose members were managers or proprietors. He had studied the work rate of trainee operators, using pen recorder techniques and audio-visual pacing. When asked if trainees should have prior experience of hand composition, he replied, 'I do not consider that knowledge of the composing room is all that important.'

28. Smith's (1988) memoir is instructive. Apprenticed as a compositor in the 1920s, he 'received a good education in composing, including Monotype key-boarding, and particularly in spelling, punctuation, and setting cleanly' and 'was brought up to regard OUP's *Rules for compositors and readers* and Collins's *Authors' and printers' dictionary* as essential text-books'. To the Monotype operator, speed was indeed important: 'It was one of the reasons why I kept output records in the "hungry thirties", when thousands of printers were out of work. . . . The fast and clean operator was always assured of a well-paid job.' And 'the keyboard operator who was worth his salt was one who could turn out clean proofs from poor copy': 'clean' meant 'no more than 0.25 of a mistake per 1,000 ens' (Smith, 1988: 4, 91).

29. For a corrective to technological determinism, see Noble's (1979) case history of the design, development, and use of automatically controlled machine tools. Against the determinism which takes technology as 'the independent variable . . . an irreducible first cause from which social effects automatically flow', he shows, on the contrary, that (p. 12) 'technological development is socially determined', and that "'social impacts" issue not so much from the technology of production as from the social choices that technology embodies'. I am grateful to Ole Lund for pointing out this article to me. There are no comparable studies in typography: Seybold (1984, 1985), Wallis (1984), and Blunden (1984) describe technical change; the nearest to a study of changes in the social organization of production is Marshall's (1983).

book printers by the early 1970s.<sup>26</sup> The application of microcomputer technology to text composition a decade later allowed boundaries in the workplace to be further redrawn. Typesetting became office work and typesetting offices themselves were often dispersed into a cottage industry, as some companies found it profitable to avoid overhead costs by sub-contracting to 'self-employed' outworkers. This is an early example of the imposition of what are now called 'flexible' contracts of employment.

The British printing industry has never had a good record of training, and that of publishers has been no better. Predictably, proprietors in both sectors failed to fight off the Conservative government's plan to abolish the Printing and Publishing Industry Training Board in 1983, and this was accomplished 'despite fierce opposition from the trade unions, who argued that during such a period of intense technical change the need for training, and especially retraining, has never been greater' (Marshall, 1983: 49). It was widely assumed that the 'de-skilling' of printing work – reorganizing it to limit most workers' space for decision-making – inevitably followed upon the new technologies. In the dispirited jargon of the demoralized trade, as it was organized under the new work regimes, a typical first-stage product of photo-composition was called 'idiot tape' – an unformatted stream of keyboarded characters. Producing this stuff required less compositorial than typing skills – the ability to concentrate for long periods of time on hitting the right keystrokes in the right order. So H.O. Smith (1988: xvi) sadly observed that the compositor had been 'reduced to the level of typists . . . he operates in clean carpeted rooms looking more like a laboratory technician than a "comp".'

Hard-nosed opinion within the trade had little room for nostalgia about Monotype operators' skills as they receded into memory. Albert Goldthorp (1968: 98), head of Monotype's training school, reckoned that 'There are two basic skills in keyboard operating: the ability to "input" copy to the brain by reading, and to simultaneously "output" copy by manual keystrokes.'<sup>27</sup> Expert compositors might reply that this was far less than the whole story: that their job required them to know orthography, to know how to interpret house-style, and to understand conventions for the visual presentation of written language.<sup>28</sup> They might also say that their skills amounted to designing at the level of micro-typography – at the level of word, line, and paragraph. And they could plausibly claim that their anonymous work, along with that of printers' readers, protected authors, copy-editors, and designers from the publicly visible consequences of their slips and errors. So it is ironic that perceptive computer scientists working within electronic publishing now suggest that the standard of quality for automated typesetting should be 'to produce typographical results which are . . . indistinguishable from what would be expected from a reputable compositor' (Mittelbach and Rowley, 1992: 262–3).

Changes in typographic practice were not determined by technology: they were made by managerial decisions about the organization and discipline of work which were made easier by technical changes.<sup>29</sup> As Alan Marshall pointed out, de-skilling was not a necessary consequence of the inherent capabilities of computer-based typesetting systems; these were in fact more flexible and capable than the hot-

metal machines which they replaced, and could have been used to integrate keyboarding and typographic skills with decision-making (Marshall, 1983: 105):

But in general they are being used by management to break up the work sequence into simplified and more easily quantifiable sections; and by placing the emphasis on volume production, they are wherever possible being used to introduce mass production methods into composition. This has the double advantage for employers of increasing productivity and reducing union power.

That there was nothing inevitable about this is shown by the kinds of alternatives which were explored in Scandinavia. A good example is the cooperation between workers in the graphic trades and researchers through the 'UTOPIA' project of the early 1980s. Its objective was to combat de-skilling by developing alternative ways of using computing technology and of organizing work – ways which gave priority both to the quality of work experience and to the quality of resulting products (Bødker and others, 1984).<sup>30</sup>

#### *Optimism of the modern*

For some British typographers working in education and as practitioners, the years from the middle 1960s to the late 1970s were characterised by what could be called an optimism of the modern.<sup>31</sup> For them, mastering the new composition technologies was an opportunity to be relished, and was part of a more ambitious goal – of a radical investigation into, and re-ordering of, typographic practice. When the challenge from computing arrived, it was directed not at designers' intentions but at the ways in which they were formulated – at specification. In C. J. Duncan's words:

This is an age of specification writing, in printing as in other technologies. . . . To know how to write the specification correctly requires comprehension, lucidity, imagination, and precision. It is an engineering design operation, modified by artistic conceptions. There is no longer any room for the use of ad hoc procedures. (Duncan, 1964: 124)

One response to this can be seen in the 'Typographer's Computer Working Group', set up in 1969 – on the initiative of Ernest Hoch and Maurice Goldring – by the Society of Industrial Artists and Designers (SIAD) and the Society of Typographic Designers. The thread of specification ran through its four sub-groups, which investigated conventions, terminology, standardization, and typographic measurement. The Working Group's last act was to publish in 1980 a set of 'Computer typography publications', intended to help designers to get the information they needed in order to specify effectively by asking printers the right questions about the capability of photocomposition systems. Maurice Goldring also campaigned for professional training in specification. In the Institute of Printing's journal, *Professional printer*, he wrote that: 'Knowledge of . . . specifications is an important part of a practising designer's expertise. Assessors for the SIAD and external examiners for the Council for National Academic Awards have frequently commented on the lack of adequate specifications, including layout drawings, in submitted work' (Goldring, 1982: i). Goldring, like Ernest Hoch and a handful of others, energetically worked through the committee rooms of the British Standards

30. John Dreyfus (1994), remarking that few 'excellent book printing houses . . . have survived into the present computer age except in a severely truncated form', has a predictable and well-worn explanation. Although 'those who went out of business did so for an accumulation of reasons', he offers just one: 'Compositors' wages had risen to disproportionate heights, driven by the demands of newspaper compositors, who had been able to hold their employers to ransom. . . . The rise in wages also affected book production' (Dreyfus, 1994: 289).

31. Ken Garland recalls the period from the mid 1960s to the mid 1970s as 'the most satisfactory period of type specification' (letter to the author, 5 July 1994).



Institution: they saw standardization of good practice as the best way to repair the deficiencies of professional practice in specification; one result of this work was the radically revised British Standard on copy preparation and proof correction (British Standards Institution, 1975, 1976). Goldring and Hackelsberger (1972: 2) contrasted the informal specification methods within printing with the example of the unified and rational approach of the Swedish construction industry, involving a common pattern of specification for all building trades. They proposed a standard specification system for print production which would in effect work as a meta-specification, from which elements could be drawn to assemble any particular parts of a job specification.

The system

would be both a method and a physical object. As a method it is the simplified, rationalised means by which a standard specification for a particular job specification . . . can be arrived at . . .

The information contained in the standard specification system should be of high technical quality, presented in concise, clear language. It should be the most comprehensive assemblage of such information available. It should, therefore, list all materials, equipment, and processes that are in use and all attainable performance requirements.

A similar confidence characterized the meetings of the Working Party on Typographic Teaching (WPTT), which between 1967 and 1970 offered a national forum for local initiatives in education.<sup>32</sup> Its strikingly optimistic *Interim report* of 1968 put typography at the core of design method in graphic design, recognizing the changing nature of typographic work ('The designer is . . . becoming increasingly concerned with planning and co-ordination as a major function'), acknowledging the place of specification ('an important aspect of design'), and regarding as 'absurd' the fact 'that design students . . . should be uninformed of relevant equipment, processes, standards, conventions, and terminology.'

#### *Visible consequences*

Outside these pockets of optimism, the period from the middle 1970s to the middle 1980s was, in Britain at least, bleak for many typographic workers whose objective was 'quality'. Demoralization in the composing room filtered through to the offices of designers. A recurring theme of the passing literature of typography during this period is the low quality of typesetting. Compositors appeared unable to produce an acceptable product, while typographers were unable to specify how to secure its achievement. Both would despairingly contrast the products of photocomposition with those of the hot-metal typesetting with which they were familiar. In this there may have been a measure of nostalgia mixed with fear of loss of skills, and so of self-respect. But perceptions of declining quality were not just subjective: the evidently low standard of much photocomposed output arose from objective mechanical limitations. Delivery of each of the basic functions of typesetting – character selection, sizing, and positioning – seemed faulty, or at best unpredictable. Character sets were inadequate, lacking non-lining numerals, small capitals, and ligatures. Character images – whether analogue or digital – were fuzzy and of variable density from one 'take' to the next. The whole range of type sizes was usually

32. Reports of stirrings within education occasionally fitted into the trade. The *Monotype newsletter* 88 (February 1971) published an article on 'Information design: Stafford College of Art and Design'; a caption to an illustration of student work described it as 'specified for Monotype composition . . . typeset from the student's typewritten specification'. And at The University of Reading, an undergraduate course in 'Typography & Graphic Communication' was set up in 1968.

# ABCDEFGHIJKLMN

Figure 1. Actual size variations in different renderings of 'Univers', all at the same nominal size of 8 pt: A Monotype Lasercomp; B Monophoto 400/8; C Linotron 303; D Berthold Diatronic; E Monophoto 600; F Monotype 2000; G AM Compset 3550; H Photon; I Linotype VIP; J Compugraphic 9000; K Autologic APS 5; L Bobst Eurocat; M Alphacomp; N Linotron 202. (From Cohen, 1979.)

33. WPTT discussions of typographic terminology in 1980–81 were echoed a decade later in the European 'Didot' project's aim of establishing 'a homogeneous and universal terminology' (Didot, 1992: 10). But the promised 'multilingual typographic technical dictionary' has yet to appear, and effective agreement has proved elusive.

34. Among the best known unpublished composition rules were those of Penguin Books, devised by Tschichold in 1947 and revised by Hans Schmoller up to 1972. For electronic publishing, Southall (1992: 277) gives as examples of rules of composition those 'which a formatting system uses to assign values to interword spaces in justified text, and to decide on locations at which words are divided'.

generated from a single master set without optical scaling, resulting in 'very small type which is difficult to read and display alphabets which are no great pleasure to look at' (Williamson, 1981: 146). Typeface names became unreliable, since typefaces were plagiarized by new manufacturers who had machines to sell but no typeface libraries; and the same typefaces were poorly recycled by their original owners. In the eyes of many typographers, even the best conversions did not bear comparison with their metal embodiments. The comments of George Mackie and Gerald Cinamon are typical: 'the classic faces are denatured by modern technology' (Mackie, 1988: 159), and 'many type faces in those days [the 1970s], beautiful in hot metal, were grotesque and unusable when converted to photosetting' (Cinamon, 1987: 41). And the unpredictability of type sizes (figure 1) led to the frustration experienced by Hans Schmoller at Penguin Books in the early 1970s:

Poor-quality photosetting and increasing economic pressures were proving disastrous to Hans's concept of well-made books with well-considered typography ... he had tried to control the tide by devising a system for hardback publishers so that photographically reducing their pages would result in a correctly-proportioned Penguin page. But, based on standard sizes of hot-metal types, it was quickly overwhelmed by the new technology: each printer had a different-size 10-point, or 11, or 12. (Cinamon, 1987: 41)

Poor quality resulted not only from engineering limitations but also from the difficulty which compositors experienced in operating, and designers in specifying for, the new systems. As Goldring and Hackelsberger (1972: 2) pointed out, there were few industry norms to regulate typographic specification; and the distance between the work experiences of designers and printers was surmounted only by those few typographers who had some experience of working as, or very closely with, compositors. So confidence about outcomes was lost on both sides of the specification: typography and typesetting had become unreliable and unpredictable, a matter of guesswork. In these circumstances, some typographers abdicated – on anything other than routine copy they marked 'set to fit' and hoped for the best. One index of the effects of these changes on work was the destabilization of the typographic vocabulary:<sup>33</sup> basic words – 'fount' (or 'font'), 'leading', 'type size', 'typeface' – lost their meanings and acquired new but ambiguous ones, further confounding the difficulty of writing and interpreting specifications. Another sign was the disintegration of composition rules,<sup>34</sup> and on this point typographers like George Mackie look back ruefully (1988: 158):

I had the good fortune to ... take for granted highly literate keyboard operators and compositors. Not until typesetting became a kind of typewriting, with typists at work instead of time-expired tradesmen, did I begin to acknowledge certain invisible skills, such as hyphenating, which if practised today at all so often results in idiocies.

A good illustration of this is provided by the difficulties which designers faced when attempting to specify word spacing in unjustified setting. In order to do this, the designer must first know, or find out, just what a typesetting system can deliver. The following is an extract from an exchange in April 1980 between a designer and the

typesetting manager of a company which supplied many British publishers; it is conducted by written memo, and indirectly via an intermediary, the publisher's production manager. Here the designer wants to find out what can be specified, and what results can be expected of the system; the object of the exchange appears in figure 2:

*designer:* We cannot fathom the sample shown here – please ask for an explanation, as all the four settings appear to have the same word space, not 12-, 18-, 24-, and 30-unit as described.

*typesetting manager:* We hadn't noticed this until you pointed it out. The explanation is that the word spacing automatically goes to fixed output whenever we set unjustified lines. It is fairly logical when you think about it but we hadn't noticed. At this stage there is nothing we can do about it I'm afraid but we will keep it in mind.

Such an exchange witnesses an irrevocable change in the relationship between designers and printers. John Trevitt reflected on the changed balance of control:

As publishers have become more and more thorough in their instructions to typesetters – which was by and large forced on us with the advent of computer-assisted and direct entry phototype-setting – the balance has perhaps tilted too far: having learnt the hard way . . . to leave as little as possible to chance, we now leave nothing to judgement and good sense either. (Trevitt, 1987: 34)

The fact that designers were largely ill-equipped to take control would become irrelevant, since typesetting by trained compositors was already retreating to the margins.

Figure 2. This sample of four alternative word space settings, produced in 1979 by a typesetting company in response to a typographer's request, was the cause of the exchange cited in the text above. The typesetting manager's explanation was neither 'logical' nor based on an understanding of this function of the typesetting system.

#### *Optimum of 12*

The keyboard operator has only limited control over the actual widths of the word spaces in a line; and further, that the amount of space between the words will vary from line to line. This being so, the practice of some typographers in specifying '3-' or '4-unit word spaces' is meaningless.

#### *Optimum of 18 (system standard)*

The keyboard operator has only limited control over the actual widths of the word spaces in a line; and further, that the amount of space between the words will vary from line to line. This being so, the practice of some typographers in specifying '3-' or '4-unit word spaces' is meaningless.

#### *Optimum of 24*

The keyboard operator has only limited control over the actual widths of the word spaces in a line; and further, that the amount of space between the words will vary from line to line. This being so, the practice of some typographers in specifying '3-' or '4-unit word spaces' is meaningless.

#### *Optimum of 30*

The keyboard operator has only limited control over the actual widths of the word spaces in a line; and further, that the amount of space between the words will vary from line to line. This being so, the practice of some typographers in specifying '3-' or '4-unit word spaces' is meaningless.

## 5 Designing and using specifications

### *Writing and designing specifications*

Specifying has required both drawing and writing. In typography the word ‘layout’ means, to use Tschichold’s words, a ‘plan on paper for a job to be printed’ (1991: i). The word ‘specification’—referring to information provided in a set of papers of which the layout was one—may have been imported from architecture and engineering design, and seems not to have gained wide currency until the 1950s. However, Beatrice Warde used both words in 1945: ‘the master printer’s drawing is called a layout. And whatever of the “intention” cannot be shown in the drawing, e.g. as to the quality of the materials, is put into words and called . . . the specification’ (1955: 67). And so in 1951 did the British Typographer’s Guild, in the wording of its application for membership, which required

the submission of an effective and accurate typographical layout by the would-be member, together with clear type specification and other instructions on a separate paper, or on tracing paper placed over the layout. (Moran, 1978: 25)

What has variously been called the ‘type specification’, the ‘composition specification’, the ‘written specification’, or just the ‘specification’, I will refer to as ‘standing instructions’. These are often appended to the copy or, more informally, inscribed on a layout,<sup>35</sup> and they usually take the form of lists or tables of attributes, supplemented by minimal commentary, to summarize rules which apply throughout the composition of a job. In some workplaces such as book publishing offices they are written on standard forms; and however efficient this may be for routine office management the effect can be highly impersonal, as if to put still more distance between the writer of the specification and its recipient (figure 3). The principle of standing instructions is one of specification by exception—‘like this except where otherwise stated’—and the exceptions are stated on the copy in the form of ‘mark-up’.<sup>36</sup> Thus the copy is ‘marked-up’—annotated by the designer in words and numbers, supplemented by conventional graphic symbols, or ‘copy preparation marks’ (figure 4). While standing instructions are generalized, mark-up is particular. Its purpose is to indicate local instances beyond the reach of standing instructions, and to anticipate compositor’s queries by confirming the designer’s intentions in areas of possible doubt.

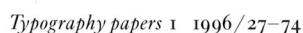
The reason for making layouts is obvious: a drawing economically maps positional relationships in ways which can be much more easily interpreted than a list of words and numbers by a trained reader. A layout says ‘what you see is what I want’. But the little that has been written about layouts has taken them as aids to designers in forming their intentions, rather than as specifications.<sup>37</sup> Thus in 1932 Jan Tschichold (1991/1932: i–ii) addressed his little manual on how to draw layouts to ‘jobbing compositors’, and urged that ‘they should be able to make them for themselves’. And Dreyfus and Baudin (1972: 2) commented that:

However carefully and accurately layouts are prepared, they will never make it possible to form an opinion on one vital aspect of the printed page—its ‘colour’, for this is governed by the choice

35. In the ‘drawing-free’ environment of electronic publishing, specifications are likely to be purely alphanumeric (see British Standards Institution, 1991: *Specifying electronic typographic markup*; International Organization for Standardization, 1992: *Information and documentation—Electronic manuscript preparation and markup*).

36. Rice (1978: chapter 2) gives a clear account of the principle of ‘specification by exception’ and of its operation.

37. Recent studies of drawing in design (e.g. Arnheim, 1993; Goldschmidt, 1991) treat it as a cognitive tool for creative problem solving; the word ‘sketching’ is significant here. Arnheim (p. 19) says: ‘Sketches . . . not only supply the designer with tangible images of what his or her mind is trying out in the dimness of its own freedom, but they also point the observer or theorist to catch a few stop-motion glimpses of the flow of creation.’





of type and paper, the quality of the ink, and the quality of the setting.

As in Tschichold, layouts are here considered as aids to visual judgement in the process of designing, rather than as vehicles for communicating their intentions to other people to act upon. And they can indeed be made for purposes other than specification: to satisfy the designer, to persuade the client, and to charm the printer (figure 5). In the words of one of Robin Kinross's contributions to the Reading specification discussions:<sup>38</sup>

a layout may well require a simulation of the appearance of the finished item, as well as measurements, if this helps those implementing the specification. (A thorough simulation of finished appearance is an essential aid to the designer as a means of testing visual decisions; whether this simulation serves also as the specifying layout will depend on the particular circumstances of the design task).

Specification layouts are usually scaled drawings (typically 1:1) supplemented by verbal and numeric labels. They take different forms, depending upon whether their scope is generalized or particular and local. Hence global layouts ('master layouts' and 'grids') are like standing instructions: they delineate boundaries and positional conformities throughout a document. But complex units within a text, such as tables, require special attention: layouts for these are a form of elaborated mark-up (figure 6). There is also the special case of the 'coordinate layout' (figure 7), which was used by technically well-informed designers for a brief period in the 1980s for graphically complex documents such as forms and other 'diagrammatic' arrangements of text, where the positions of graphic elements need to be uniquely specified.<sup>39</sup>

Layouts are of particular interest because both their content and form are less constrained than standing instructions and mark-up, both of which use highly restricted linguistic codes. So they can be more fluently personal than written instructions, and their graphic notation may reveal more of the designer's voice (figures 8 and 9). George Mackie (1991: 30) describes his layouts, which 'were as much for my benefit and the publisher's' as for the printers contracted by Edinburgh University Press:

I used semi-transparent bank paper with a slightly rough surface, which takes pencil well. I made no attempt to simulate the black of printer's ink. Instead my layout resembled a page printed in grey, but a balance in grey will be a balance in black. Once visually satisfactory, I wrote in details of type size, and so on.

Whatever a designer's intentions, they must be expressed in a form which can be readily translated into a command 'language' which drives a typesetting machine. The verbal components of specifications were written in what may be called 'common typographic language', which is ordinary language mixed with technical terms. The propositions written in this common language had then to be translated by compositors into the languages used by formatting devices – device-dependent languages, as they came to be known (such as Cora 5 and Densy, Linotype's proprietary languages). To typographers these may have seemed distant family relations to common typographic language; few could either write or understand them, but this

38. Robin Kinross, 'General considerations in specifying for make-up' (contribution to Reading specification working group, 1979).

39. Southall (1982: 16) introduces 'graphic complexity' by contrasting it with graphically simple continuous prose, where: 'The position of each successive word in the text is determined by the specification of the text as a whole – the maximum extent allowed for each row of characters, and the distance between the rows – and the content of the text which precedes the word in question on the page.' One could speculate that graphic complexity might be measured by the number of specification decisions – say by the ratio of formatting 'command' to text keystrokes.

Figure 5. Anthony Froshaug's layout for a book wrapper for Alain Fournier, *The wanderer. Le grand Meaulnes* (translated by Françoise Delisle; London, 1947: Paul Elek). More is said and shown here than is strictly necessary to convey information. But layouts can be made with several aims in mind: to satisfy the designer, to persuade the client, to charm the printer.

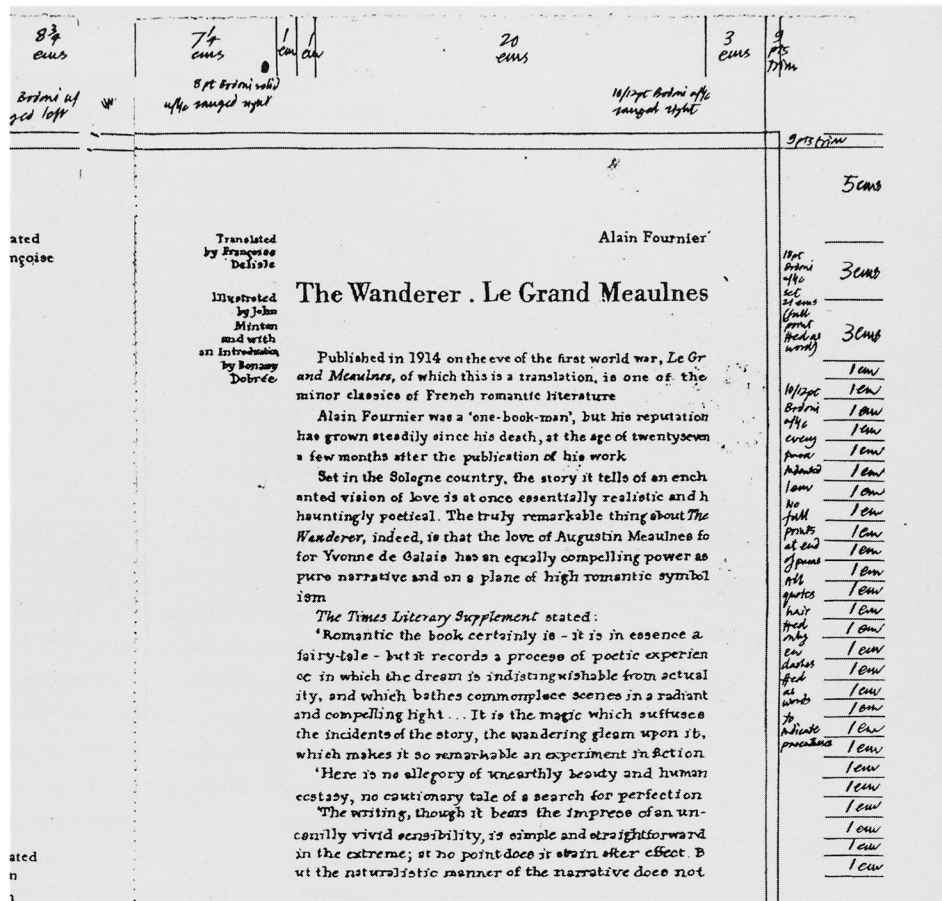


Figure 6. Tables may require layouts which are a form of elaborated mark-up. Detail from specification made for *Journal of the Printing Historical Society* (no. 15, 1980/81) on the change from Monotype to Lasercomp typesetting; set and printed by The Alden Press, Oxford.

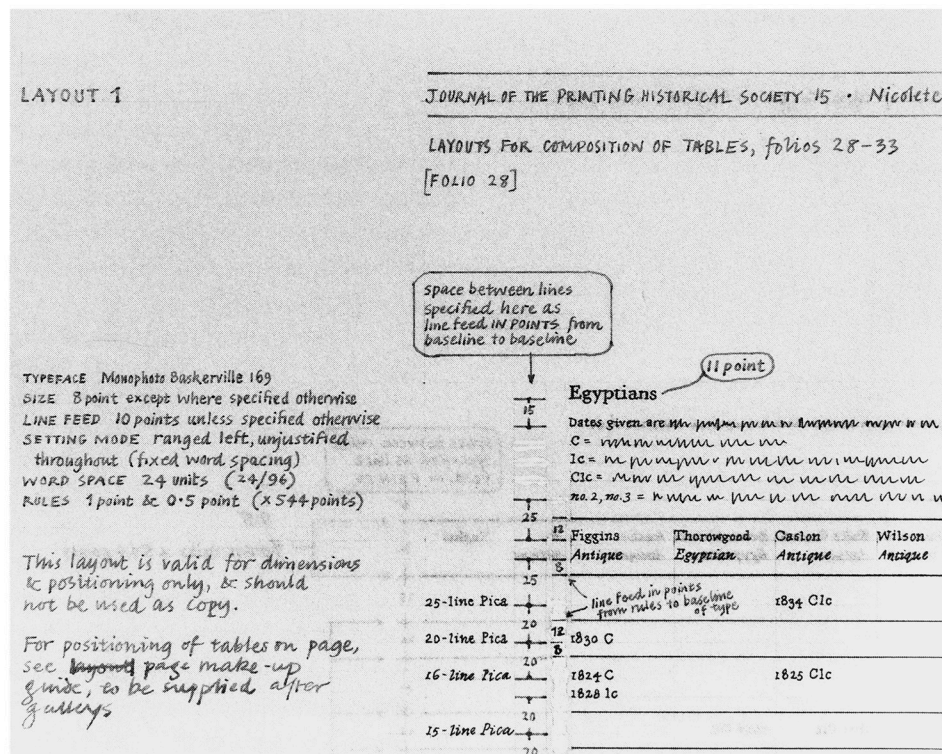


Figure 7. Detail from a coordinate layout (made by the author in 1987) where positions of graphic elements are mapped for typesetting on a millimetric grid.

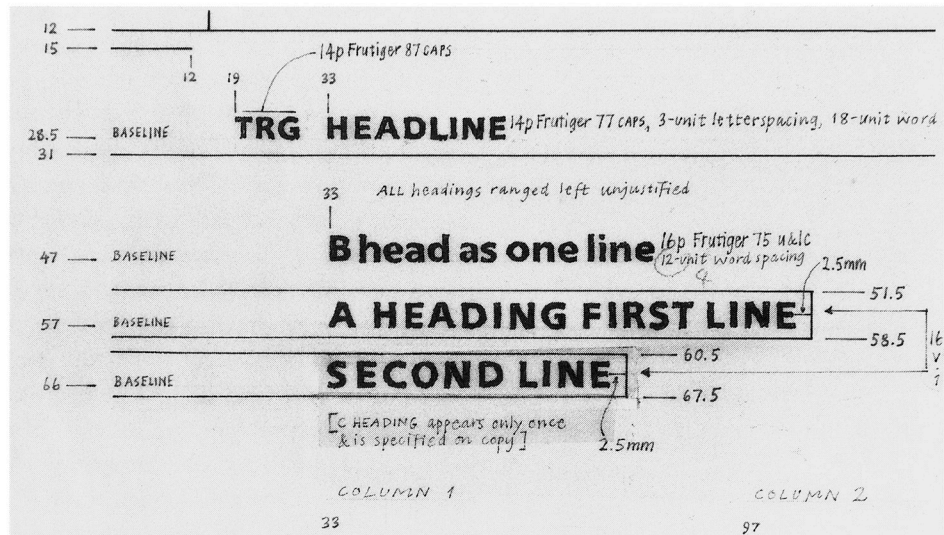
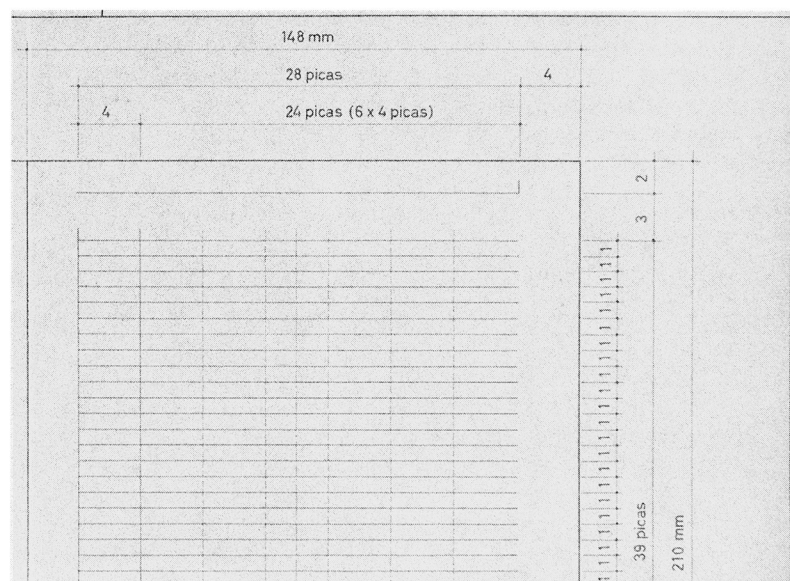
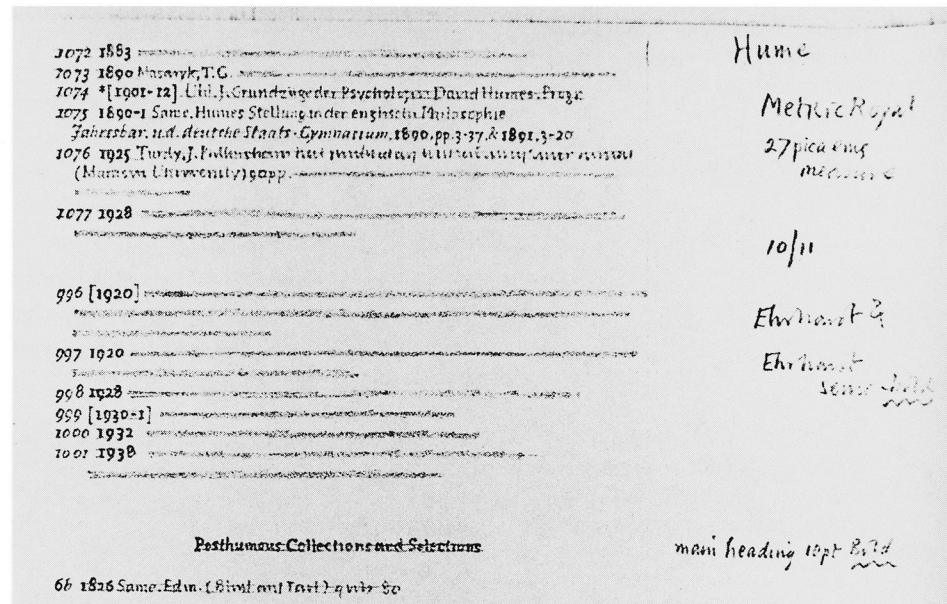


Figure 8. Different layout styles. George Mackie (above) uses pencil on bank paper, and renders type images to give an impressionistic picture. This, together with the handwriting, gives an informal effect. The layout is made first as an aid to his own judgement; instructions to compositors are added later. Maurice Goldring (below) uses technical pen and ink to draw the master from which this dyeline copy was made. In this layout the precise, smooth and mechanical rendering, and standardized notation – ruled baselines rather than type images, stencil lettering rather than handwriting – are relatively impersonal and formal. This layout is made purely as a specification and is intended for the compositor only. Mackie trained in fine art and painting, Goldring in architecture.

(Mackie's layout, dated 8 October 1975, is for Edinburgh University Press's projected 2nd edition of T. E. Jessop's *Bibliography of David Hume*. Goldring's is a 'master layout and make-up grid' for the *Westminster maths* textbook series, published from 1971 by Ginn; it is dated 18 August 1967.)





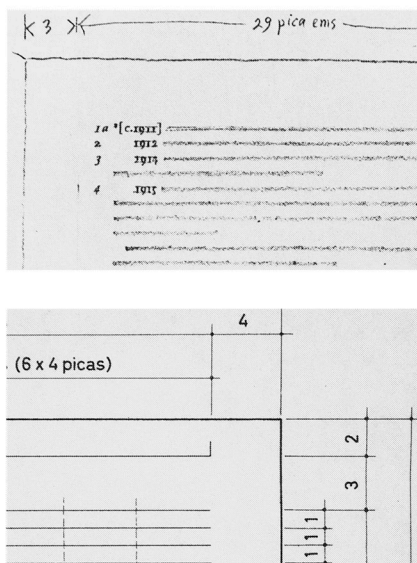


Figure 9. Rendering of dimensional lines and terminals: compare Mackie's sketchiness (top) with Goldring's more formal notation – the ruled lines and solid circles employed here follow architectural and engineering drafting practice.

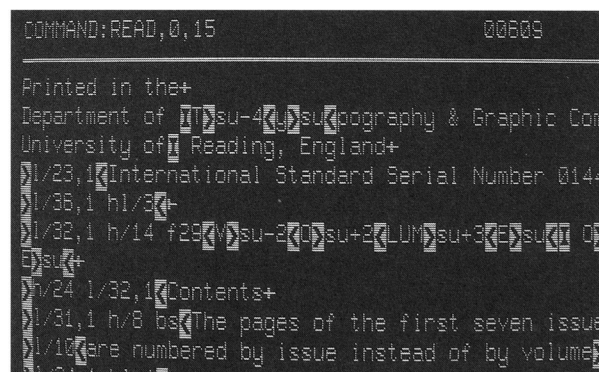
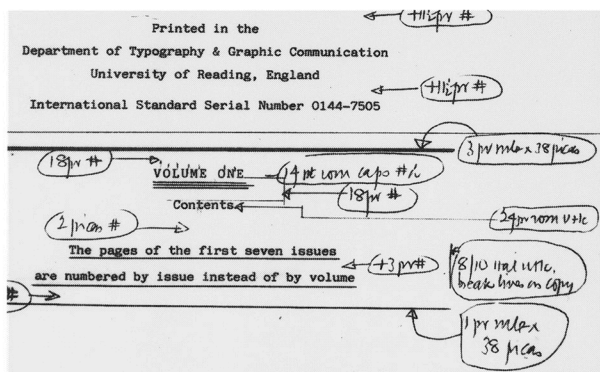
Figure 10. 'Common typographic language' is a highly abbreviated form of ordinary language, mixed with technical terms (detail from figure 3).

Figure 11. *below left* Common typographic language: Hugh Williamson's mark-up for the *Bulletin of the Printing Historical Society* (1988). *below right* Mark-up translated into a proprietary command language, Linotype's 'Densy'.

was no obstacle since they were normally required to do neither. What they had to do was to accurately and clearly use the common language (figures 10 and 11).

Once the specification had been made it was sent along with the copy for composition. The little we can know about how specifications were used at work, and about the interactions between typographers and compositors, has to be deduced from informal oral reports and from documents like those illustrated here. (The fact that these documents have been preserved may suggest that they are not typical of the everyday working practice of most typographers.) But it is clear that much work which is reasonable to call designing was done by compositors. Typographers specified what in electronic publishing environments are called 'presentation rules'. These were not deterministic: they did not normally prescribe exactly what the compositor should do, but more usually an intended result. Presentation rules established limits within which the compositor would make further decisions, by implementing composition rules. The precise content of composition rules would vary among typesetting houses, as would the precise ways in which they were implemented: the compositor often had a considerable degree of freedom here, and in effect worked as a designer at the level of micro-typography. And the compositor's skill lay not so much in knowing the rules, but rather in interpreting them in particular contexts, and in knowing how to resolve conflicts between them. It followed that the outcome of a designer's specification was unlikely to be exactly replicated from one compositor to another. By contrast, with computer-based automatic formatting systems ('structured document systems') the outcome of a typographic specification is in principle exactly repeatable.

Prelim/endmatter titles 14/18 pt Bold caps, ranged left	Part No. 12 pt Bold caps, ranged left and title 16 pt Bold vlc, ranged left. Cap initials of all important words.
Chapter No. 14/18 pt Bold ranging left Chapter title 14/18 pt Bold caps. Turn lines range inside chapter no.	Appendix No. 12 pt Bold caps, ranged left and title 14/18 pt Bold vlc, ranged left. Cap initials of all important words.
Headings in text: typeface, typesize and interlinear spacing	
(A) As chapter title and above (B) 10/11 1/2 pt Bold vlc, ranged left, 3/4 line # above, 1/4 line # below (C) 10/11 1/2 pt Italic vlc, ranged left, 3/4 line # above, 1/4 line # below D Where (B) & (C) fall one above the other # thus: (B) c 1/2 line (C) c 1/2 line (B) in notes to sources should be same size as above but have 1 1/2 line # above, 1/2 line # below	
Additional details SEE LAYOUTS A-F	



*Reading and using specifications*

Specifying is commonly seen as a straightforward, if not passive, act of transferring technical information from one expert to another: so straightforward, in fact, that the human recipient could be missed out. Here is C. J. Duncan (1964: 124) on writing specifications for computer-based composition: 'The machines work so fast that once started there is little or no possibility of changing their operation; so the instructions given them initially must be as near correct as possible.' The instructions are given to 'them', the machines: and this elision – directly from correct specification to machine – suggests that the human interpreter could be bypassed, as if the machine itself could read and act upon a specification. This is, or was, not an unusual view: the teaching of specification to student typographers, when it has been taught at all, has mainly been about the capability of typesetting systems and only rarely about the needs of their human operators whose work required them to read, interpret, understand, and act upon a specification. And this underlines the importance of Goldring's emphasis, in the 1960s, on human agency: although enthusiastic about the new composition technologies, he was critical, for example, of the International Computer Typesetting Conferences of 1964 and 1966, where 'the one form of relationship left undiscussed was that of man to man, i.e. that of the typographer to the keyboard operator and vice-versa' (Goldring, 1968: 8).

There was nothing leisurely about reading a specification: it was done in the workplace under severe pressure of time. For compositors a specification failure was anything which caused them to stop composing because of insufficient, contradictory, or poorly presented information. When this happened they would try to get more, or better-quality, information: either by an enquiry to the specifier, or, and more likely, by interpreting as best they could – and this could involve making calculations or conversions. Beatrice Warde (1955: 108) vividly reminded designers about the economy of time in the workplace:

[the compositor's] indignation is now reserved for the inefficient layout . . . which contains miscalculations as to the length of the copy, slight inconsistencies in style, demands for non-existent sizes of type . . . or other puzzlers which are made so exasperating to the compositor by the fact that they are set out so officiously. . . . The time required to discover what the fellow really means and to think out the nearest practicable thing that can actually be done, mounts up distressingly on the time-docket by which compositors account for every half-hour or quarter-hour which they spend on any job.

And here is Hugh Williamson (1977) on interruptions to the pace of work in book composition:

Queries during composition are anathema: the process is timed, paid for by an incentive bonus which is a premium for productivity combined with an agreed level of accuracy, and subject to a programme agreed with the publisher.

This explains why in large typesetting houses interpretation of the specification was often mediated by managers – the keyboard operator might see only the copy, and never the layouts and standing instructions. In these cases the specification documents would first be scrutinized by the composing room manager, who would translate the

common typographic language of the specification into discrete chunks of formatting language code, to indicate a sequence of keystrokes for the operator to follow.

The obvious should not need stating – that specifications had to be designed for the people who had to use them.<sup>40</sup> But to design a specification in a way that supported compositors' work meant knowing both about how the work was likely to be done – the 'operational matters' referred to in section 3 – and also about the processes of reading and using specifications. Patricia Wright (1994: 1.6–1.11) summarizes for information designers the cognitive demands made on readers when they follow instructions. Three clusters of processes are involved: searching for relevant information, understanding and remembering what is read, and applying the knowledge gained from reading by acting and monitoring the consequences of actions. To take the simplest of these: when they search, compositors must decide what to look for and how to search for it, then carry out the search activity and monitor it as they do it, and then recognize the target when they find it. A well-designed specification will support this work: 'The specification should have a clear visual structure, the way it is arranged should lead you through, and help you to find the things you need.'<sup>41</sup> Wright (1994: 1.9) cites experimental work which suggests that instructions are followed more accurately when they start by giving the reader a high-level description of the task to be done. This is exactly what experience has taught compositors: they want verbal and numerical descriptions to be supported by drawings, and they invariably look at the layouts first. 'You start with the layout, and ask: what is there here, and what goes where? It helps you to build up a picture before you go on to the details.'

Eugene Ferguson (1993: 87) describes how readers of an engineering drawing must learn how to extract information from it:

Experienced readers know what to look for and pursue the wanted information until they find it or until they are satisfied that it is not on the drawing. [They] . . . first build in their mind's eye a three-dimensional picture of the object depicted; they then proceed to whatever details they need to determine the intentions of the drafter. Just as the drawings of any complex object or system require many days to construct, so readers require considerable time to understand them thoroughly. . . .

And a typographic layout may be like this: an inexperienced reader may find it confusing at first because there may seem no obvious place to begin looking and reading, and because little in the drawing calls attention to itself. Drawn lines which describe shapes can be mixed up with other lines that carry dimensions; the graphic attributes of a mark may be constitutive of the designer's intended meaning, or merely contingent.

Wright (1994: 1.9) points out that readers' understanding of instructions can be captured by action schemas. And compositors, like other experienced readers of technical information, construct and retain schemas – default mental structures derived from the experience of familiar ways of carrying out an action. Those structures consist of an abstract description of the goal of the activity, together with vacant slots that can be filled by the specifics of the action to be performed in particular cases. In a well-ordered activity such as

40. Though perhaps it does: a friendly reader of a draft of section 3 queried my use of the verb in this passage: 'to design specifications that were acceptable to and usable by compositors'.

41. The words quoted in this paragraph are Mick Stocks's, in a teaching session with typography undergraduates at Reading on 17 February 1987.

typesetting, compositors read instructions with the aim of filling the slots in their current – and probably well-established – mental schemas. So when reading a layout the compositor begins by looking, to get a general impression of the whole drawing: this may be done within seconds. But this first impression is not precise, so the compositor next paces over the drawing, scanning it in order to build up a sharper picture of details and of the relations between parts. This activity is familiar and purposeful, and it is done with expectations: searching for salient cues in the drawing which call for attention, for recurring positions, for vertical and horizontal alignments, for an underlying structure, to establish norms and deviations from them.<sup>42</sup>

But sometimes things just go wrong: specifications contain errors, compositors fail to understand designers' intentions. And whatever the nature or cause of these errors and misunderstandings, the consequence was that compositors had to interpret as well as they were able or inclined. To know about typographers' errors and about compositors' difficulties of interpretation would require observational studies of the shared work of typographers and compositors played out through specifications and proofs. To state this requirement is at once to realize the improbability of ever now achieving it. So rather than exhaustively listing examples of typographers' specification errors, I simply point to passing evidence – drawn from education and professional practice – which illustrates the kinds of problems which are likely to have regularly occurred (figures 12, 13, and 14). In particular, the example shown in figure 14 is a reminder that

designers must still speak the printer's language when they instruct him in printing matters, and like everybody else who has the privilege of giving instructions designers have a duty to make their instructions clear and unambiguous. (Williamson 1983: xiii)

This is a clear injunction to examine the language of specification, and it is what I will try to do next.

42. For a discussion of experts' and novices' interpretations of technical diagrams, see Lowe, 1993. For an account of the complexities involved in reading graphical expressions, see Petre and Green, 1993.

Figure 12. Specification problems: failure to allow manufacturing tolerance. Extract from one of Ernest Hoch's notes (27 October 1979) to the Reading working group on specification, referred to on page 37.

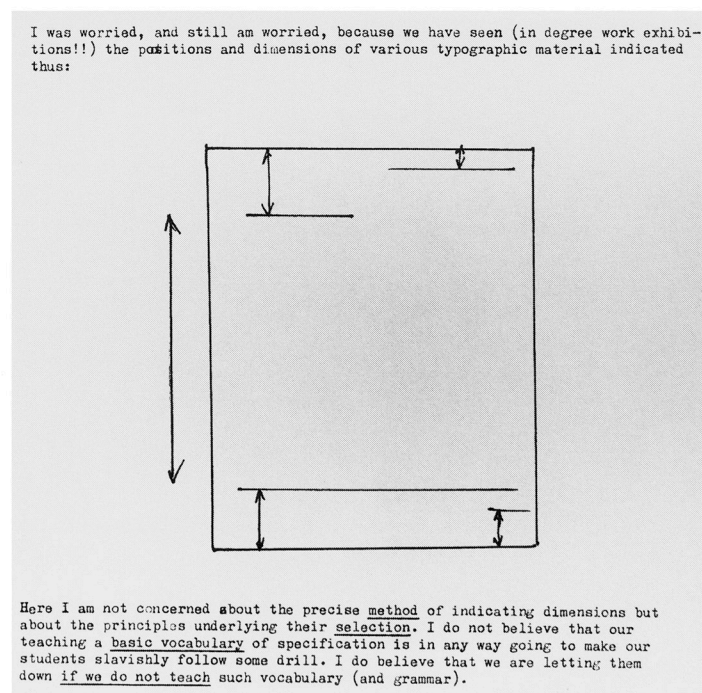


Figure 13. Specification problems: failure to select relevant dimensions, and units with which to specify those dimensions. From Ernest Hoch's teaching notes (handout to students), 19 June 1979.

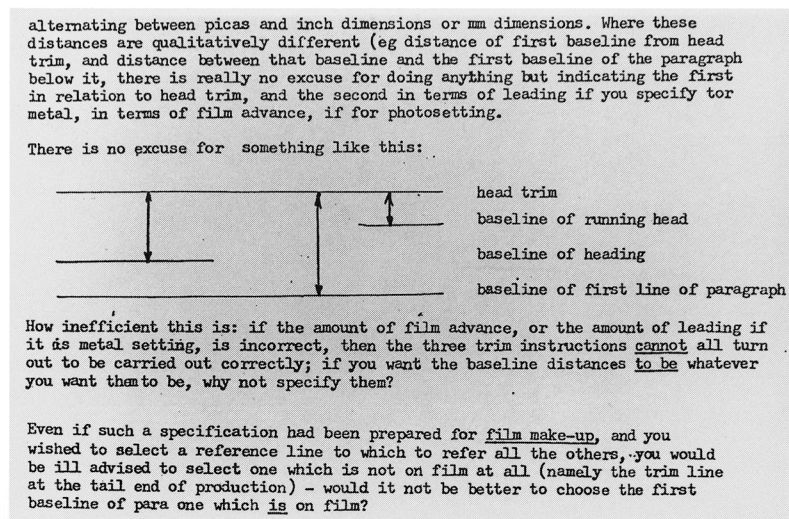
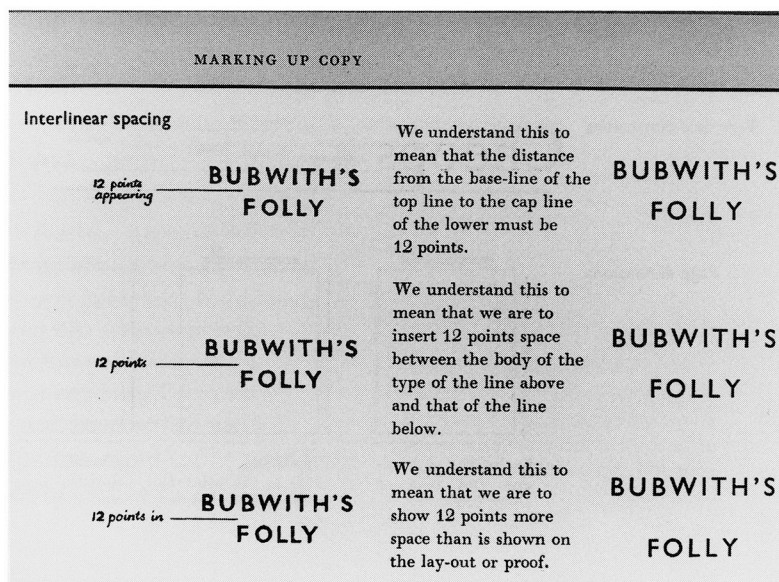


Figure 14. Specification problems: ambiguous language. The printing house Butler and Tanner felt it necessary to publish this explanation of its interpretation of designers' various ways of marking vertical space (Butler and Tanner, 1962: 14).





## 6 Specification and language

A specification is an act of communication and an act of language. It follows that a specification could be analysed linguistically. But specifications are usually drawn as well as written, and may also include three-dimensional models. Although words and numbers are invariably needed to interpret or amplify the meaning of these non-verbal representations, such representations are not comfortably accommodated by conventional linguistic analyses.<sup>43</sup> And while linguists take a relatively abstract, structural, view of the rules which connect linguistic signs to potential meanings, I would here be more interested in specifications as concrete instances of language use, and in what they could reveal about the kinds of exchanges which occurred between participants in the process of designing and making. So I would need to grasp the techniques which typographers deployed in actual language exchanges, techniques grounded in their experience and knowledge of work.

While it should be possible to envisage the outlines of an ethnographic study of the work of specification, the materials for such a study are hard to find. Even if more than fragments from the documentary trail were available, there would still be little or no access to the exchanges between the participants and the actions which they have taken. And even if access was not thus limited, then questions would still arise about the evidential status of such verbal reports. But these obstacles themselves may be enough to at least provoke a sketch of the context for a hypothetical study of specification – one which would look for correlations with the language features which mark out this kind of communicative event. It could begin with the institutionalized setting: the workplace, the place and time in which labour is sold, and its patterns of command and control. Then there are the participants: the specifier and the executant (perhaps with intermediaries) who usually will not know each other. There is the activity for which language is produced – work, printing work, the typographic aspects of that work; and this progressive refinement might generate successively distinct linguistic activities, each with local norms and conventions. The explicit content of the specification describes the organization of characters and sizes and positions on a display surface; but its implicit charge may appear to be simply a command, ‘Do this work’. The medium is graphic – drawing and writing. The linguistic code is a restricted form of written language: a severely reduced system which is constrained by context, which employs a limited and partly technical vocabulary and a simplified syntax, and which routinely uses formulaic constructions and conventionalized layout. And the form and organization of the specification text may conform to patterns which identify it as a representative of a particular genre: say, instruction-giving at work.

When designers specify, do they instruct by commanding?

A moment’s pause will suggest that when people communicate they often do not make their intentions explicit, and as de Beaugrande and Dressler (1981: 117) observe, people rarely say things like: ‘I hereby try to get you to comply with my plan’, yet these are some of the most frequent intentions of discourse participants’. And these are just

43. For a sceptical response to the suggestion that natural language can explain the manipulation and interpretation of graphic expressions, see Neilson and Lee, 1994. For a positive argument – that ‘even without universal principles, the tools of pragmatics are already beginning to help to understand the many and varied conventions of graphical design’ – see Oberlander, 1996.

the intentions which typographers have in making a specification. How, then, do typographers get the compliance they want? What linguistic devices do they use? We might assume, as I have loosely done so far, that they use the explicitly manipulative act of commanding. But as we shall see it is not as simple as that.

Although a specification may look like a one-way act of communication, there is a sense in which it is conversational: the propositional statements it makes can be seen as answers to questions which the writer thinks the reader will ask. The basic unit of a specification takes a very simple form: 'text element x has the typographic attributes A', or simply 'x = A' (figure 15). But these units can be envisaged as components in a terse question-and-answer dialogue (imagine a specification given over the telephone). Thus:

*Question* What is the word space value for unjustified setting in this job?

*Answer* [The] word space [value for unjustified setting is] 12 units [except where otherwise specified].

A specification is not a message in a bottle: even if its writer does not personally know its readers, it is possible in principle to determine the expectations and needs of those readers. But too much can be made of this. The writer of a specification does not always know for sure what its readers need. Specifying is something like a guessing game; and while designers may have a generalized picture of readers' expectations and needs, they can only rarely tailor a specification to individuals.

Figure 15. The basic unit of a specification is 'text element x has typographic attribute A'. See, in Hans Schmoller's standing instructions (above), 'set x in A'; and in George Mackie's layout (below), the same formula is expressed in an annotated drawing.

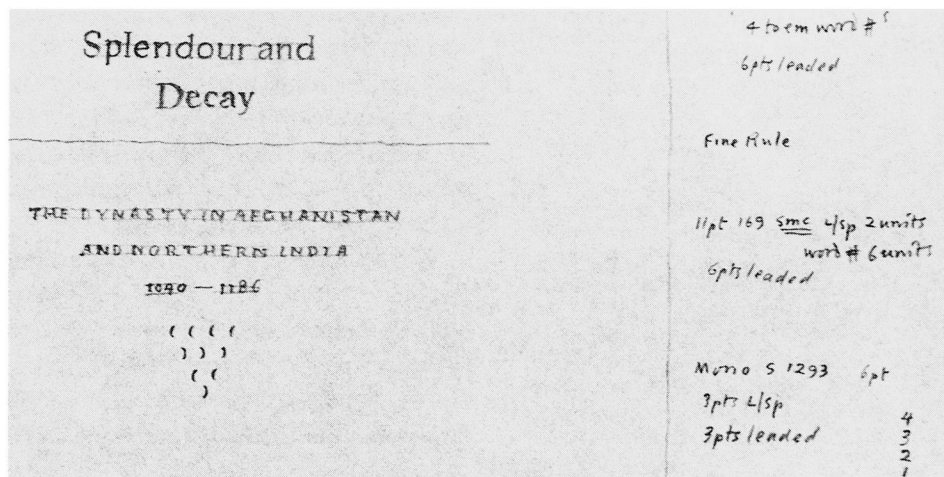
(Schmoller's specification, dated 24 July 1972, is for G. J. Copley (ed.) *Camden's Britannia: Surrey and Sussex*, Hutchinson, 1977. Mackie's layout, dated 15 January 1977, is for the title page of C. E. Bosworth, *The later Ghaznavids*, Edinburgh University Press, 1977.)

Set pp. 169-170 "1702/b" of typescript in 12 on 13 pt Bembo, 22½ picas, close spacing.

Set verse marked ¶ in 11 on 12 pt Bembo usually centred on 22½ picas.

Set <sup>Gough's</sup> notes marked [ in 10 on 11 pt Bembo, 22½ picas. Each note starts a new line 1 em indented. All subsequent lines of same note full out (i.e. treat as ordinary paragraphs). Green letters of typescript/MS to be set in ordinary (not superior) i.e. letters, followed by full-stop.

Superior numbers (note references) in text: in the final make-up these will run from 01 to 99, then start again with 01, run to 99, etc, etc. It is impossible at this stage to give each reference its final number (because there are references in both the actual text and in Gough's notes, and the exact order in which these references will appear on



Discussion of conversational behaviour often calls upon what H. P. Grice (1989: 26) described as the ‘cooperative principle’, from his observation that ‘Our talk exchanges . . . are characteristically . . . cooperative efforts; and each participant recognizes in them, to some extent, a common set of purposes, or at least a mutually accepted direction.’<sup>44</sup> He summarily framed the principle in these terms: ‘Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged’. And this he enlarged to four categories under which fall some more specific maxims; these maxims govern conversation under an assumption of rational co-operation between its participants. The maxims are listed below, and to each I append brief comments on its applicability to typographic specification considered as dialogue.

Grice’s first maxim falls under the category of ‘quantity’: ‘Make your contribution as informative as is required (for the current purposes of exchange). Do not make your contribution more informative than is required.’ In other words, specify neither too little nor too much – be as complete as necessary, but don’t over-specify. Typographers agree with this: Rice (1978: 119) says that typographers should ‘know enough not to specify needlessly’, and Warde (1952: 26) complained about layouts which contain ‘officious little pencil strokes for every detail’.

The second category, of ‘quality’, generates the maxim: ‘Try to make your contribution one that is true.’ And, specifically, ‘do not say what you believe to be false; do not say that for which you lack adequate evidence.’ Truth may be an inappropriate category in this context, but a specification should faithfully represent the designer’s intentions, and should be both accurate and valid within a given domain of application; hence: ‘Point sizes of characters are valid for Lumitype 713 only’.<sup>45</sup> And here is Jan Tschichold (1977: 15) on what he saw as a common failure in specification, and which we could see as a failure to observe the maxim of quality:

The ‘book artists’ understood little about typography and could hardly handle their own typefaces correctly. Even Emil Rudolf Weiss still gave the corrections, following on from his layouts (which, on our present understanding, were quite inadequate) in millimetres, if he wanted to have more or less leading – or even with the words ‘a bit less’ or ‘a bit more’.<sup>46</sup>

Under the third category of ‘relation’ is the maxim: ‘Be relevant.’ In other words, don’t say unnecessary or inappropriate things; for example, don’t specify trimmed paper sizes or inks to the compositor, or word spaces to the press operator. To take an example from Ernest Hoch’s teaching: ‘When you specify, you try to take into account . . . who each particular part of your specification is addressed to.’<sup>47</sup>

The fourth category of ‘manner’ produces the maxim: ‘Be perspicuous’; and more specifically, ‘avoid obscurity of expression; avoid ambiguity; be brief; be orderly.’ What matters here is not what is said but rather how it is said – how it is designed. The arrangement and manner of a specification will indicate how methodical and well-organized its author is, and suggest what freedom is allowed for the compositor’s interpretation. And if a random assortment of typographic parameters

44. Waller (1987: 264–5) was probably the first to suggest the applicability to typography of Grice’s work on conversation.

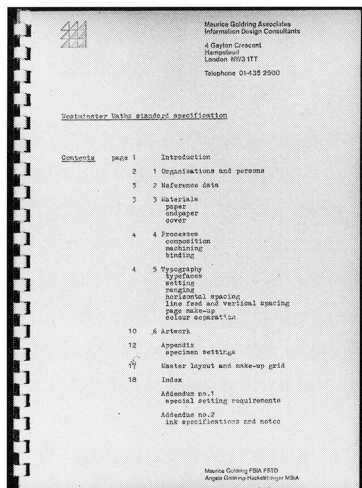
45. From Maurice Goldring’s layouts made in 1966 for *Advances in computer typesetting* (1967, London: Institute of Printing).

46. I am grateful to Robin Kinross for pointing this out and for giving me his translation.

47. From Ernest Hoch’s teaching notes (handout to students, 19 June 1979, part of which is shown in figure 13).



Figure 16. Front cover and contents list of standard specification for *Westminster maths* series (published by Ginn, London). Maurice Goldring and Angela Goldring-Hackelsberger; the document is dated 10 April 1972.



<u>Westminster Maths standard specification</u>		
<u>Contents</u>	page	
	1	Introduction
	2	1 Organisations and persons
	3	2 Reference data
	3	3 Materials paper endpaper cover
	4	4 Processes composition machining binding
	4	5 Typography typefaces setting ranging horizontal spacing line feed and vertical spacing page make-up colour separation
	10	6 Artwork
	12	Appendix specimen settings
	17	Master layout and make-up grid
	18	Index
		Addendum no.1 special setting requirements
		Addendum no.2 ink specifications and notes

There is nothing in Grice's maxims with which designers would disagree. Here is another extract from notes made by a contributor to the Reading working group on specification in 1979:<sup>48</sup>

The users of a specification should be kept constantly in mind. A specification could be a model of consistency and yet be unintelligible to those having to implement it . . . . This suggests that your language (verbal or visual) must above all be right. It should be constructed in the terms of the user. . . . An appropriate language also implies, more subtly, an appropriate tone of voice. A specification should speak with (not down to) the people implementing it.

So although a linguistic study of specification might offer unusual data for sociolinguists and discourse analysts, typographers may not need it to tell them that specification is purposefully utilitarian; that although it could be analysed in an abstract way it is still a palpably material and socially situated act of language; that it may be framed as a string of commands but that it can also be seen as a kind of stunted dialogue. Typographers know that a specification should be accurate, complete, valid, relevant, appropriate, and usable. They know also that to satisfy these requirements it should be both coherent and cohesive: that its structure should be clearly displayed, that it should be presented in a manner which corresponds usefully to the order in which the people who implement it will do their work.

Is specification as neutral as might be inferred from de Beaugrande and Dressler's (1981: 123) suggestion that by following Grice's maxims producers of text (specifiers in this case) 'are merely trying to communicate with the minimum of needless effort and disturbances'? It is hard to avoid the sense that something is missing from the account so far, and that the study of language alone may not supply it. The missing element is to do with the ambiguous constitution of authority at the point at which decisions are made, and the unequal distribution of power between those who give instructions and those who receive them.

#### *Specifications as texts*

So much for generalizations. How do they stand up in a scrutiny of the texts of real specifications? The samples which follow are taken from the written component of specifications, from standing instructions and verbal annotations on layouts. At first glance their linguistic character looks unpromising. They are usually structured in terms of single words and phrases, rather than in the more highly organized units of the clause. The impoverished verbal materials typically exhibit extreme economy – for example, articles, prepositions, and conjunctions either occur infrequently or are absent. In this sense they have many of the characteristics of 'block language', messages which 'most often consist of a noun or noun phrase or nominal clause in isolation: no verb is needed, because all else necessary to the understanding of the message is furnished by context' (Quirk and others, 1972: 414).

Writers of 'common typographic language' in standing instructions may seem to be doing little more than adopting the particular set of lexical items appropriate to the technical domain of typesetting: '36 points interlinear space', '12 units letterspaced', 'paras indent 1 em', '20 pica measure', and so on. But there are also grammatical correlates to

<sup>48</sup>. As on page 37 above, the notes are Robin Kinross's.

this variety of written language: for example, the passive voice is common and clauses are often nominalized. Thus:

Variations from the specification may only be made with the written permission of the designers, to whom all requests for variations must be made (Goldring and Hackelsberger, 1972: 1)

rather than, say, 'You may make variations only after getting our written permission.' The writer's attitude to the readers, to the subject matter, and to the purpose of the communication may be as evident in the words of a specification as it is in the drawings. So what we have seen in layouts we also see in writing: a range of positions between the extreme poles of, on the one hand formality, coolness, impersonality, and on the other informality, warmth, and friendliness.

I wrote of specifications 'framed as a string of commands', and will return to the question of whether designers really do command when they specify. The approximation may be adequate to the extent that in discourse the function of a command is to instruct somebody to do something. But a closer look at the language of real specifications shows that it may be an almost misleadingly loose formulation. The materials discussed below are samples (shown in table 1) taken from specifications made by Maurice Goldring, George Mackie, and Hans Schmoller. (I should say that the samples are not systematically selected: they were chosen because they were available, and because of the range of linguistic expressions which their devisers employed. No assumptions about representativeness can be made about them.)

In syntax a command is a sentence which normally has no overt grammatical subject and where the verb is in the imperative mood (Quirk and others, 1972: 386). (A good example of 'strings of commands' are recipes in cookery books, where imperatives are usually the only form of command used.) In the imperative the subject is rarely expressed, but the source of command is clear: 'I command you [to do this work]'. Commands are non-negotiable, and most proof-correction marks are just like this. Imperatives do indeed occur in these specification samples: from the strong 'use', 'do not use', 'get', 'set', 'avoid', 'follow', 'make sure that', to the weaker 'take special care that', 'aim at', 'try to'. Sometimes the terseness of these imperatives is qualified, or smoothed, by markers of politeness: 'please lead', 'please proceed'.

However, the imperative is just one linguistic structure which can be used for the act of commanding, and an alternative language tactic is to turn commands into statements or even questions. So, for example, 'It would be a great help if [prose passages in plays] could . . . be set [line-for-line]' is a command according to function, but a statement according to form. And likewise the softly expressed question, 'Would it be possible to use [a fixed 3-unit space after initials and abbreviations]?', functions as a command.

The function in discourse of a statement is to convey or declare information to somebody: in contrast to commanding, stating is a neutral act, making no obvious claims about power relations. In these specifications statements occur just as frequently as commands, and it is noticeable that declaratives<sup>49</sup> are typically expressed in the passive voice: 'x are', 'x to be', 'x should', 'x must'. And of particular interest here is the modalized declarative form: 'x must', 'x shall', 'x should'.

49. I use these grammatical terms loosely here: more correctly, statements and commands are types of sentences, while declaratives and imperatives are clauses.

Table 1. Language in specifications.  
The expressions in the first column are from standing instructions, layouts, and copy mark-up made by Hans Schmoller (S), George Mackie (M), and Maurice Goldring and Associates (G).

X = text element

A = typographic attribute or state of presentation.

*Sources.* Hans Schmoller's specifications are for: N. Pevsner, *The buildings of England* series (Harmondsworth: Penguin, from 1951); *The complete Pelican Shakespeare*, (Harmondsworth: Penguin, 1969); G. J. Copley (ed.) *Camden's Britannia: Surrey and Sussex* (London: Hutchinson, 1977).

George Mackie's specifications are all for Edinburgh University Press: N. Armstrong, *Change in the space age* (1972); T. E. Jessop, *Bibliography of David Hume* (a projected 2nd edition, but not published); G. P. Morice (ed.), *David Hume: Bicentenary papers* (1977); C. E. Bosworth, *The later Ghaznavids* (1977); N. Daniel, *Heroes and saracens* (1983).

Maurice Goldring and Associates's specifications are for: Institute of Printing, *Advances in computer typesetting* (London: IOP, 1967); *Westminster maths series* (London: Ginn, from 1971).

<i>imperatives</i>				
use /do not use	S			
get		M		
set	S			
avoid	S	M		G
follow				G
make sure that	S			
take special care that	S			
aim at	S			
try to		M		
<i>imperatives, qualified</i>				
please lead		M		
please proceed	S			
use reasonable A	S			
<i>imperatives, conditional</i>				
if ... [then] range				G
if possible ...	S	M		
if possible, do not ...				M
A where necessary				G
<i>questions</i>				
would it be possible to ... ?	S			
<i>declaratives</i>				
it would be preferable to	S			
probably A will be o.k.	S			
X are unusual		M		
this will A, I think		M		
A should do very well	S			
no X presumably		M		
use of A deprecated				G
it is impossible to foresee A	S			
A is not always possible to foresee	S			
A cannot at present be foreseen	S			
<i>declaratives, passive</i>				
X must	S			
X shall	S			
all X are / X are	S	M		
all X to be / X to be	S	M		G
X are to be	S			G
X should	S			
most X are		M		
X starts	S			
X ranged				G
<i>declaratives, conditional</i>				
it would be a great help if	S			
it would help if	S			
it may help if	S			

Here the 'command' function is not carried through the authorial role directly, but modally, through the use of the auxiliaries 'must', 'shall', and 'should', all of which invoke the designer's authority by expressing obligation, insistence, or necessity (Quirk and others, 1972: 82, 99, 393).

Typographers cannot make all specification decisions with certainty, nor can they precisely predict the outcome of each decision. So if we imagine a continuum of certainty and precision, then at the far end there are formulations such as: 'if . . . then', 'if possible', 'use reasonable [word divisions]' (a notable combination of the imperative with an appeal to 'use your judgement'), 'it would be preferable to', 'would it be possible?', 'it would be a great help if', 'it would help if', 'it may help if', 'probably 10pt will be o.k.', 'this will just get in, I think', and 'TNR superior figures should do very well'. In these phatic pleas a human voice breaks through the normal formality, as it does in comments and asides such as 'presumably?', 'therefore', 'x are unusual', and in the straight admission of unpredictability ('x cannot at present be foreseen', 'x is not always possible to foresee', 'it is impossible to foresee x'). The pleas may give little information to the compositor, but they signal the specifier's vulnerability and attempt to enlist the compositor's solidarity.

Given that designers have differing degrees of knowledge and of confidence in that knowledge, so their specifications are likely to reveal a range of positions from something like 'I know exactly what I want' to 'I know what I want but don't know how to get it' to 'I'm in trouble: please help me to sort this out'. And whatever their degree of confidence, there is always an implied appeal: 'I rely on you to do the best you can for me.' With these increasing degrees of uncertainty, so there is greater latitude and space for negotiation.

The question arises: why do designers adopt syntactic forms – statements – which do not correspond to their discourse function of commanding? Even if all typographers were constitutionally polite, good manners alone would not be a sufficient explanation. It seems that through their linguistic moves they act out the dictum that knowledge is power: the less knowledge they have, the less power they have. So they hedge their bets, and use the tactful language of diplomacy.

#### *The syntax of instruction*

The position from which Fowler, Hodge, Kress, and Trew (1979) work offers a sharp insight into the conduct of language exchanges between designers and printers through specification. In their view language is a part of social process, not merely an index of it; so in their words: 'Language not only encodes power differences but is also instrumental in enforcing them' (1979: 195). One of their analyses is of spoken interviews, and it leads them to argue that these forms of language exchange conservatively reinforce existing social structures. To sense the relevance of this argument to specification, in the passage which follows I have substituted the words 'specification', 'designer', and 'printer' for their 'interview', 'interviewer' and 'interviewee':

specification is a mechanism of control of one individual by another; its 'ritual' function is the re-affirmation of the designer's right to control the behaviour of the printer, and this ritual is part of the legitimization of the roles of 'more powerful' and 'less



powerful' which society has ascribed to the participants (p. 2; emphasis in original)

This may be putting it more plainly than some designers would feel comfortable with.<sup>50</sup> And Fowler and Kress's analysis of the language of rules and regulations – specifically, club rules which prescribe what members should do and not do – throws further light on what happens when typographers specify to printers (pp. 26–27):

Rules are instructions for behaving in ways which will bring about an intended or desired state. Hence they presuppose a knower of the appropriate behaviour, who needs to transmit that knowledge to someone who does not have the knowledge.

Knowledge is one source of power . . . if both participants agree on their role-relationship, the application of power is unidirectional; there is no hint of negotiation for control.

Once again this goes straight to the question of whether the designer's specification is intended to control the behaviour of printers, and if so to what extent it actually does. As I suggested in section 3, this question is the source of the tension which runs through the working relationship between designers and printers.

We have already seen that typographic specifications are different from rules and recipes to the extent that they allow scope for negotiation, which is possible because both participants have incomplete knowledge. To the extent that the compositor has knowledge that the typographer does not have, the space for action is not wholly controlled by the designer. And specifications might routinely invite questions by explicitly stating: 'all enquiries to . . .'. If a designer with insufficient knowledge refused that space for negotiation, then the result could be the kind of withdrawal of cooperation described on page 40 above.

Fowler and Kress's analysis of the language of rules<sup>51</sup> shows that 'the relation between the writer of the rules and the recipients . . . is ambivalent: they are members of two overlapping communities with totally different status relations' (p. 35). This makes sense in terms of specification: there are 'overlapping communities' of interest – designers and printers – whose status relations are indeed different. But the writers of rules are also club members, and they share interests and perhaps acquaintance with other members. This means that 'authority conflicts with friendship, and so the expression of authority becomes problematic' (p. 35). Designers and printers may or may not have shared acquaintanceship, but they shared some common objectives, and so needed to entertain the possibility of mutual respect for the skills of the other – necessarily so when those skills were made evident through performance. Designers knew that the pursuit of quality required not only consent – compositors' willingness to accept instructions – but also cooperation – compositors actively using their expert judgement in following them through. The less designers specified, the more they relied on the compositor's decisions.

Fowler and Kress refer to 'the shifts and awkwardnesses in encoding the power relationship in terms of the functions of the rules' (p. 35), which arise because the rules have to do two things at once: they have to be directive, and they have to be constitutive. So here was a dilemma to which some designers might have been sensitive: 'needing to regulate without compromising constitution, [and] to constitute without

50. Though not all: my first teacher of typography, Desmond Jeffrey, was a partner in a small design and print workshop. In 1970 he met one of my observations with the sharp reply 'We aren't designers, we're printers – designers tell other people what to do.'

51. Here quotations followed by page references are from Roger Fowler and Gunther Kress's chapter on 'Rules and regulations' (in Fowler and others, 1979: 26–45).

obscuring the essentials of practical instruction' (p. 36). This may explain why many commands do not appear in their direct syntactic form, the imperative: instead declaratives and interrogatives are used, and the indirectness of the speech-act, its linguistic distance from the intended act, signals both social distance and social indirectness.

In such linguistic moves specification played its part in 'the creation and affirmation of a "natural" world of work in which inequitable relations and processes are presented as given and inevitable' (Fowler and others, 1979: 2). It may be that typographers also knew, and know, this. But their knowing is buried, the normal is made 'natural', and is only brought to the surface of attention by printers' acts of resistance – their 'bloody-mindedness', the withdrawal of their 'loaf', their obstinate refusal of anything more than working to contract.

### 7 After specification: the de-skilling of typographers?

Few typographers enjoyed the work of specifying: it came at the end of the job, as a final price to be paid for the more evidently creative work of form-giving. Specifying demanded orderliness and patience, but was often necessarily done in a hurry by designers unsettled by doubts about how to best say what needed to be said, and also by insufficient confidence about its material result. Proofs may have been awaited eagerly, but also nervously, because apportioning the costs of corrections was done by reference to the copy and specification.

So while many typographers will be happy that typographic specification now appears to be unnecessary, the fact remains that until quite recently it was the one direct result of their work – the thing which they wholly wrote, designed, and made. But what is now called 'traditional' typesetting – done by trained compositors using computer-based equipment which is dedicated solely to typesetting, and where text capture and formatting is done under the same roof – has disappeared from all but a few specialized areas, such as bookwork. So specification in the sense that I have described it is largely restricted to those areas.<sup>52</sup> And this is the result of the reorganization of typographic work made possible by microcomputing. Here software has been more important than hardware: since the early 1980s microcomputers have been widely used in commercial typesetting as input terminals, but without much impact on design practice. This is because they ran code-based, device-dependent proprietary typesetting languages, which to designers were much like – and perhaps even more unfathomable than – the 'languages' of Monotype's or Linotype's mechanical keyboards.

Two things in particular changed typographic design work: Apple's graphic user interface for the Macintosh, and Adobe's device-independent page description language, PostScript. The 'direct manipulation' mode of working with computers made possible by 'wysiwyg' displays suited designers' need for fast and high-quality visual feedback. People who complain that screens offer low-fidelity graphic representations should look again at figure 11 to see what compositors typically saw on their screens. This technology quickly became congenial to designers, and in the early days was indeed marketed as satisfying their supposedly 'intuitive' ways of thinking

52. Oxford University Press's press advertisement for a book designer (July 1994) asked for 'the ability to produce detailed type specifications for text'. This basic professional requirement could not be taken for granted and had to be explicitly stated.

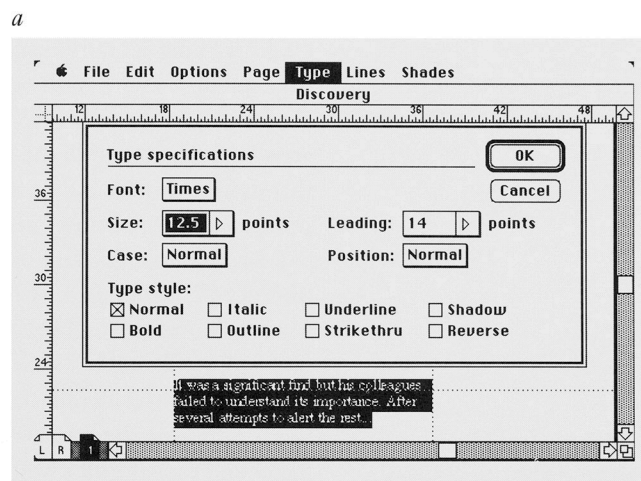
and working. And no matter how typographically sophisticated are other device-independent languages – TeX for example (Knuth, 1984; Clark, 1992) – they are unlikely to be of much interest to most designers until they show on screen what is happening as it is happening. A device-independent language like PostScript running under a graphic interface presents an appealing mask to people who use it, since the mask is drawn and written in a reasonably familiar dialect of the common typographic language. If the mask was removed, the language beneath would be just as unintelligible to most typographers as any proprietary typesetting language (figure 17).

Figure 17. A device-independent language (PostScript) and its mask. The figure (from Black, 1990a: 61) is in three parts, explained thus:

*a.* Transformations of character descriptions can be input relatively effortlessly via the menus and dialog boxes of a dtp package, such as PageMaker 3.5 shown here. The package translates the options selected into the relevant commands in the system's programming language.

*b.* Some of the PostScript code necessary to achieve the result delivered by the dialog box selections and positioning data in *a*.

*c.* The end result delivered by *a* or *b*.



*b*

```
/yline 270 def
/xline 220 def
xline yline moveto  %% X Y coordinate of first baseline
/linefeed 14 def
/Times-Roman findfont 12.5 scalefont setfont

/xline currentpoint pop 2 add def

(It was a signi\256cant find but his colleagues failed to
understand its importance. After several attempts to alert the
rest...)

220  %% measure
{xline yline moveto show
/yline yline linefeed sub def}
linebreakproc  %% refers to previously established procedure
```

*c*

It was a significant find but his colleagues failed to understand its importance. After several attempts to alert the rest...

So present-day typographers use a microcomputer, its graphic interface, desktop publishing software, and a laserprinter, to get the results which Francis Meynell could only get by paying a printer for a series of revised proofs. Designers are supplied with word-processed files which they then import into a desktop publishing program in order to do 'formatting' and page make-up: a major component of composition – keystroke capture – is bypassed. They do this because their employers or clients require them to do so. A consequence is that some designers see themselves as working in craft mode.<sup>53</sup> There is still some argument about whether designers are able to do this kind of formatting work, since most do not even have typing skills, let alone compositor's skills. The following comments, culled from a printing trade periodical, are typical (Vere Parr, 1994): the owner of a typesetting and disc-conversion bureau says that 'the decline in typographic standards' is due not to technology but to 'its use by the unskilled who aren't even qualified in the English language', and that improvement through education and training is unlikely 'while clients continue to put downward pressure on typesetting costs'. The production director of a 'corporate marketing and communications' company says that 'there is a chronic scarcity of traditional typesetting houses', that 'the Mac revolution slaughtered the classic house', and that in-house typesetting has inevitably led to a decline in typographic standards because 'it is a hard and long job to train designers to think like typesetters ... they don't have the logical mindset required to set type, proof read pages and manage files well'.<sup>54</sup> There have also been arguments about whether, even if they had or could acquire these necessary skills, designers should be doing compositors' work: John Miles ends his summary of the contrarian position by quoting Bertrand Russell's definition of two kinds of work:<sup>55</sup>

the first consists of altering the position of matter in relation to the earth's surface, the second of ordering other people to do so. One is arduous and poorly paid, the other is agreeable and well rewarded. As a designer I am very happy to tell other people where to put everything but I would rather someone else shifted the stuff around.

The arguments have been overtaken by events. Just as printers' work has been fragmented and redistributed,<sup>56</sup> so has that of designers. Many design graduates get their first jobs as typesetting slaves – as 'Mac operators', servicing senior designers who have not learned how to use desktop publishing tools; typically their work is to turn their seniors' paper sketches into page make-up files. Alan Marshall's (1983: 91) observations about the printing trade in the early 1980s – split 'between low-skill, low grade inputting work and a much smaller section of specialized, high-skill analysis and manipulation jobs' – apply to typographic design in the 1990s.

Many design offices using desktop publishing no longer make specifications of the kind which are planned in advance and prepared for someone else to follow. But a specification is made incrementally, whether the designer realizes it or not, and is recorded in the page description language file each time a designer makes decisions in menus and dialog boxes. Few participants in the recent froth of public exchanges about the promise and threat of 'digital typography'<sup>57</sup> have

53. Thus Rudy VanderLans (1995: 7): 'in 1984, graphic design ... was handed a tool that would make it possible for individual designers to become self-sufficient'. For a critical consideration of the ways in which DTP interfaces often limit designers' working methods by failing to support the preparation and management of multiple drafts in ways which give designers the visible feedback they need, see Black, 1990b.

54. A trivial index is the common replacement of quotation marks by the prime sign – not because quotation marks are unavailable, but because they remain undiscovered in the farther reaches of the keyboard.

55. Letter to the author, June 1995. John Miles went on to say that 'I nevertheless spend more and more time as a typesetter manqué (or mankie).'

56. One aspect of this is the growth of in-house typesetting in financial services and management consultancy. An Ernst & Young advertisement for 'freelance night typesetters' is representative: 'fast and clean workers with lots of flair for layout, excellent Quark XPress skills (min 3 yrs), the ability to liaise directly with clients and ... exceptional project management skills' (*Design week*, July 1994).

57. In meetings such as the PIRA/RSA Design Conference, London 1990; the Monotype Conference, London 1991; a CSD/STD meeting in London 1991 and a CSD/STD/Typographic Circle meeting in London 1992; the Fuse Conferences in London 1994 and Berlin 1995.

tried to work out the implications for typographic work. One of the most perceptive observations about this was made seven years ago by Alison Black (1989: 249); it is worth quoting here at length:

It might appear that since there is a direct link between design and production in dtp – and the typographer's work on screen automatically produces the code for the product itself – specification is redundant. In some cases it is, except possibly for the designer's own records. But it is common now for lay dtp users to ask designers to produce an initial issue or version of a document . . . so that they (the clients) can take over the production of subsequent issues. . . . In reality clients usually find that replicating a design involves them in a level of decision making and precision that they had not anticipated.

The burden of communicating how to reproduce a particular design solution rests with the designer who has produced it initially. Typographers must not only specify what has to be done, but precisely how it should be done using the particular software involved: a far cry from Beatrice Warde's warning [cited above on page 34]. Warde's concerns were for the sensibilities of the skilled compositor, not the dtp operator who has had no specific training in composition. When typographers are preparing work for unskilled users to produce, they must be extremely sensitive to the procedural implications of their designs.

So far from desktop publishing signalling the end of specification, it may require new forms of specification practice which make even greater demands upon professionals for careful explanation and for demonstration by coherent example (figure 18).

Figure 18. 'Typographic styles for standard page': one of a set of five procedural specification guides prepared for *Typography papers* in 1995 by its designers, George Hadjiloizou, John Morgan, and Carl Zakrisson (then undergraduates at The University of Reading). The specifications exist as A3 paper documents and also XPress files, and they support templates and style sheets.

**Typographic styles for standard page**

- 1 Page numbers**  
Typeface: Erhardt Exp MT  
Type size: 10pt
- 2 Running head**  
Typeface: Erhardt MT  
Type size: 8pt  
Mid point  
Type size: 8pt  
baseline shift: 1.5pt
- 3 Captions**  
Typeface: Erhardt MT  
Type size: 9pt  
Interlinear spacing: 11pt
- 4 Text**  
Typeface: Erhardt MT  
Type size: 10.5pt  
Interlinear spacing: 13pt  
First line indent: 4mm
- 5 Displayed quotation**  
Typeface: Erhardt MT  
Type size: 9.5pt  
Interlinear spacing: 12pt  
Space before: 0.706mm  
Space after: 0.706mm
- 6 Note reference in text**  
Typeface: Erhardt Exp MT  
Type size: 7pt  
Superscript: 64%
- 7 Heading**  
Typeface: Erhardt MT  
Type size: 11.5pt  
Interlinear spacing: 12pt  
Space before: 6mm  
Space after: 1mm  
Left indent: 8mm
- 8 Text full out**  
Typeface: Erhardt MT  
Type size: 10.5pt  
Interlinear spacing: 13pt
- 9 Notes**  
Typeface: Erhardt MT  
Type size: 8pt  
Interlinear spacing: 9.5pt  
First line indent: 2mm
- 10 Citation line**  
Typeface: Erhardt MT  
Type size: 8pt  
Oblique stroke  
type size: 11pt  
baseline shift: -2.2pt

**Hyphenation**  
Smallest word: 6  
Minimum before: 3  
Minimum after: 2  
Hyphens in a row: 2  
Hyphenation zone: 0mm

**Justification method**  
Optimum: 80%  
Flush zone: 0mm

Figure 1. 1. E. Rele, *Ryle's hydraulic* (London, 1851). Page size 140mm. These illustrations are reproduced using two different half tone screens. On the left, 150 dpi and on the right, 200 dpi.

There is some doubt about the year in which Engelmann set up his lithographic establishment in London. An article in the *Foreign Review* in 1827, which was written by Thomas Crofton Croker, who was closely associated with Engelmann's London branch, gives the date as 1827; a slightly later article in the *Library of Fine Arts* (figure 1, 2) refers to all the examples from Britain and Germany:

No imprints of the firm have been traced that can be ascribed to 1826 and the earliest reference to it in trade directories can be found in the *Print Office London Directory* for 1828. On the basis of what is known, therefore, it would seem that 1827 is the more likely year for the founding of the firm. From the nature the style of the firm appears to have been Engelmann, Graf, Coindet & Co, and the first address known for it was 92 Dean Street, Soho. By 1830, however, it had moved to 14 Newman Street,<sup>11</sup> less than 500 metres from Hullmandel's establishment. Engelmann's position in the firm seems to have been that of a sleeping partner, and it was John Coindet who acted as its spokesman in a squabble with Hullmandel in Germany and Holland.<sup>12</sup>

A survey of unjustified typography

Among those working for the firm in the late 1820s was Michael H. 8, who became one of Britain's leading lithographic printers in the following decades; he came to England from Germany in 1827, without apparently a word of English, and left Engelmann in 1830 to set up his own company.<sup>13</sup> Jeremiah Graf, one of Engelmann's partners, also left the firm and set up in business with Soret, initially trading from the same address as Engelmann<sup>14</sup> at 14 Newman Street. Within a few years Graf & Soret had moved premises, and by 1838 Jeremiah Graf<sup>15</sup> was working on his own (to be succeeded in the mid

6. *Foreign Review* 10 (Cambridge, Mass., vol. 4, no. 7, 1827, p. 20). The article also refers to correspondence between Engelmann and Hullmandel in the *Library of Fine Arts*, 2 (Sept. 8, 1851, p. 189).

7. 'History and progress of lithography', *Library of the Fine Arts*, 1851, p. 212.

8. *Print Office London Directory* (London, 1828), *Library Blue Book* (London, 1828).

9. The correspondence between Engelmann and Hullmandel is referred to in note 6.

10. See typographic outline of the Hachette family and its firm by Christine Jackson, deposited in the 16th British Printing Library.

11. M. Twyman, *Directory of London lithographic printers 1800-1910* (London, 1978), p. 24.

12. M. Twyman, *Directory*, pp. 21-24.



Typographic work once required designers to make a specification which was then interpreted and acted upon by skilled workers. This requirement informally regulated the professional practice of typography. It was a test of competence, functioning as a gatekeeper: to pass through meant demonstrating technical knowledge and some understanding of the social organization of production work. The dismantling of the gate has been welcomed by some commentators as the democratization of typography, and blamed by others for a fall in standards. Once again, modernization is double-edged. But most typographic designing has never been done by professional typographers, and most professionals have restricted themselves – or the market for their services has restricted them – to a remarkably limited range of clients and kinds of work. So there is no need for nostalgia about the loss of skills which may never have been widespread, nor about the decline of professional typographers. As typography is incorporated into the many varieties of office work, its existence as an independent practice may appear to have been a passing phase.

The following speculative afterthoughts arise from observations made during the course of assembling the materials for this essay. The first is uncontroversial: it seems self-evident to me that work which has been held up as exemplary, as exhibiting the kind of ‘quality’ cited by typographers as an indicator of ‘excellence’, has arisen in certain conditions of production. One of these conditions was craft work, in the artisan’s shop, where there was no need for specification since the designer-maker was one and the same person. Another has been where there existed a close fit between a designer’s expectations and those of a compositor; and here little formal specification was needed since compositors knew what designers wanted, and designers knew what compositors could do. And finally, industrial typography has entailed long-distance specification: here quality has arisen through a designer’s tenacious attention to details. This has entailed clear lines of control: a designer’s willingness and ability to give exact instructions, and a compositor’s equal willingness and ability to follow them. To repeat what I said in section 3 above: the only place and time through which a designer’s ‘unrelenting care and mastery of detail’ could be exercised was at the point of specification – in and through the instrument of control over other people’s work.

The second speculation does not so obviously follow from the argument of the preceding pages. If specification had a value to designers over and above the necessity of getting work done, it was in the mental discipline it imposed upon them to externalize their reasoning – not in quiet retrospect, but where it was most urgently required, at the brink of production. Having to specify required designers to be self-conscious about their decision-making and its consequences.

And this points to my third, equally tentative, speculation: having to specify reminded designers that they did not work in isolation. Having to take a good share of responsibility for other people’s work made designers at least conscious of the people whose work it was to follow their instructions. It may even be that such user-centred considerations may have affected typographers’ view of what designing

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was about. And if, as now, there seems to many designers no need to specify – if printers are needed only to turn the wheels of multiplication – then the activity of typographic designing can become a private matter and designers may feel free to speak an ever-more designer-centred language.

If there has been a social project in typographic designing, there was a contradiction at its heart: how could quality be got through inequality? How was it possible to resolve the difference between the hope of a common goal of quality (in work, in the resulting product), and the inequality inescapably evident in one agent's exercise of power over another? The work of designing is implicated in a web of inequalities: it is not an oasis of freedom, order, and mutuality. Some designers may aim to make it otherwise, but their material work is enmeshed in the world of existing social practices. For typographers who resisted, designing has usually meant compromising within the web of those practices, while at the same time trying to tilt them edgewise.

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