

Replies to Peter Burnhill

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Replies to Peter Burnhill

Richard Southall

Writing and typography

The misunderstandings that run through the discussions summarized by Peter Burnhill in the first part of his paper are generated, not surprisingly, by differences in the meanings assigned by the participants to the word 'writing'.

One possible group of meanings has to do with writing as an activity. 'He is writing': he is using a tool to make marks on a substrate, producing an object that will serve to carry a message; 'she is writing': she is developing a new text in the written mode of language. A second group has to do with the products of the activities in the first. 'It is writing': it is a piece of written language, rather than being merely a bunch of knotted cords, or the marks left by birds' feet in wet clay.¹

John Mountford, in his article "Writing" and "alphabet", considers handwriting, 'print' and typewriting as different manifestations of a single entity: writing as a medium for language. In doing this he is clearly envisaging what I have called elsewhere 'actual documents'. These are pieces of written language, respectively handwritten, printed or typewritten in Mountford's examples, that exist in the world as concrete informative objects. They are writing as product.

For Ernest Hoch, handwriting and typewriting fall together into one category, with 'print' in another. His criterion for 'print' is that a precursor for the printed document has to exist: what he calls an 'image carrier'. Two of the examples he cites – TTS [Teletypesetter: punched paper] tapes and signals on magnetic tape – make it clear that his image carrier may be a virtual document: a specification for an actual document, that has to be interpreted by a composing system to produce the document itself.² Hoch's precursors, properly examined, reveal the content and structure of the documents they will give rise to. In producing pieces of written language, handwriting and typewriting do not make use of precursors in this sense.

Here Hoch is talking about writing as activity, in the first of the senses defined above: making marks on a substrate to generate actual documents. In that context he is correct in saying that there is a qualitative difference between printing on the one hand and handwriting and typewriting on the other. The first produces documents whose content and structure are predetermined; the second and third do not. Equally, though, in the context of writing as product, Mountford is correct in saying that handwritten, printed and typewritten documents are all examples of language carried by the medium of writing.

Like writing, typography means different things to different people. One meaning, preserved in the French use of *typographie* for letter-

1. Cf. Roy Harris, *The origin of writing*, London: Duckworth: 1986, p.17.

2. For this 'actual/virtual' terminology, see my article 'Interfaces between the designer and the document' in J. André, R. Furuta & V. Quint (eds.), *Structured documents*, Cambridge: Cambridge University Press, 1989, pp. 119–131. The issue of transience, as between a document on paper and one on a computer display, is not to the point in this discussion, although it is important in other contexts.

press printing, is mark-making with type: ‘writing at the press without a pen’.³ Robin Kinross’s statement in ‘Type as critique’ that ‘Typography is not writing’ perhaps uses the word in this sense: generating a piece of written language by setting and printing type is not the same as generating it by making marks with a pen. For Kinross handwriting does not, and perhaps cannot, exist independently of what is to be written. ‘In writing you have the text in your head and you make that text visible in unique letters, whose forms you vary in their developing context’. He contrasts this with the type designer’s dilemma. ‘With making letters for typographic composition, you don’t know what the text will be. This must be a fundamental difference, and is why typography is not writing with prefabricated letters’.

The difference between handwriting and type design is indeed fundamental, but it is not the difference between one kind of writing and another. Type design is not writing; nor is it typography. The type designer makes objects that will be used elsewhere and by other people to construct pieces of written language.⁴ When Kinross says that ‘This process of prefabrication [in the design and manufacture of type] abolishes writing’, he seems to mean that making a piece of written language by setting type removes any individual, manually-generated features from the product. ‘For writing you do need a fully breathing human being to make the letters.’

Gerrit Noordzij’s response clearly envisages both typography and handwriting as ways of making marks. ‘Handwriting seems to generate letters on the spot, whereas typography applies prefabricated letters ... If it is reasonable to call [the process of mark-making] *writing*, typography is writing, just like handwriting.’

Burnhill objects to Noordzij’s conclusion on the grounds that it is typography’s role not to generate written language but to restructure and reproduce it: ‘to transform and multiply [it] by printing’. Here he uses ‘typography’ to mean not mark-making with type, but the explicit visual ordering of a text that already exists as a piece of written language whose order is implicit in its content. This is the same as Stanley Morison’s definition: ‘the art of rightly disposing printing material in accordance with specific purpose; of so arranging the letters, distributing the space and controlling the type as to aid to the maximum the reader’s comprehension of the text’.⁵ Burnhill’s typographer’s work has as its objective the specification (not, as he suggests, the construction; typographers are not compositors) of one of Hoch’s precursors. The author’s meaning is clarified for the reader; but maybe at the cost of losing all trace of the ‘fully breathing human being’ by whom the message was produced in the first place. Perhaps present-day technology’s vernacularization of typography, moving it away from Morison’s right dispositions and back towards Plantin’s writing without a pen, is a more welcome development than it has sometimes been taken to be.

Most writing nowadays is typographic. That is to say that most pieces of written language, *at the moment when they first come into existence*, are assemblies of prefabricated marks, with the consistencies of metric and visual structure that used to be the exclusive preserve of documents composed with printers’ type. This is because they are written with WYSIWYG word-processing software.⁶ Our writer in the first of the definitions above still uses a tool to make marks on a substrate; but

3. ‘Écrire à la presse sans plume’: Christopher Plantin’s description of printing in the *Dialogues françois pour les jeunes enfans* (1567), cited by Fernand Baudin in his *How typography works*, London: Lund Humphries, 1989.

4. This is a drastically over-simplified account of what actually goes on in designing and making type, but it will do for the present.

5. Stanley Morison, *First principles of typography* (1930, and many editions since).

6. WYSIWYG: ‘what you see is what you get’. It is true that a traditional typewriter would produce documents with a consistent metric structure, and could hardly avoid giving them a consistent visual structure; but these regularities could not survive any change to the document’s content. Word-processing software regenerates a document’s orderly structure after every correction and with every fresh keystroke.

the tool is his computer, and the substrate is its display. Equally, the written language that our second writer is generating appears on her display with a good deal of order already imposed on it; she can give it more by using the facilities provided by the software in her computer; and the machine automatically produces one of Hoch's precursors, in the form of a virtual document, whenever she saves her work.

The point here is that the content as well as the structure of a piece of written language depends on the means that are available for structuring it. This is self-evidently true at one level: Michael Twyman's example of 'Pleasure ... Without ... Fatigue' has enlightened generations of students in showing them what can be done with a composing system that allows substantial variations in the size and boldness of the types it uses.⁷ But it is true at a deeper level as well. Software that displays text and illustrations alongside one another on the page of a work in progress, for example, makes it easy to write picture captions and the main body of a text together, and find an effective distribution of explanatory material between them in doing so.

The fact that many users are unable to get the best out of the facilities offered them by their computers does not devalue the facilities themselves. Still less does it label the users as stupid. The way to bring the two together is by education, and this is where writing comes in again. Burnhill says of handwriting that it is 'a form of drawing, and all drawing which demands close observation of the thing being drawn is a learning process in any field of enquiry'. Although I would agree that the best way to discover the structure of a text is to write it out, I would not insist that the mark-making part of the writing should be done by hand. Let people use whatever means is easiest for them; but above all let them look at the marks they are producing, and think about the structures they are generating. What we should aim for is not the 'well-crafted handwriting' that Burnhill sees Noordzij as restricting us to, but well-crafted writing *tout court*: Baudin's 'visual literacy'.

Spaces in text

Even in the days of metal type, not all typographic image carriers used prefabricated spaces: except in the trivial sense that the spaces were made when the carrier was constructed. Only in hand composition did the spaces between words result from deliberate choices on the compositor's part. In single-type mechanical composition a minimum width could be set for the interword spaces in a line of text, and the operator knew at the end of each line what their actual values were; but these depended on the content of the line, and could only be altered by resetting it with a different end-point. In linecaster composition from the keyboard the operator could watch matrices and spacebands accumulating in the assembler, and choose a point to end the line so that it would be neither too loose nor too tight when it was justified. The widths of the spaces themselves, though, were not quantified at all. It was only with the advent of teletypesetting, where the same tape had to run correctly on machines in different places, that the world of linecasting became conscious of quantified character widths; and even then the quantification of interword spaces was implicit rather than explicit.

7. From Michael Twyman, *Printing 1770–1970*, London: Eyre & Spottiswoode, 1970, p. 199.

This is very much the situation we are in today. It is not too hard to discover from a PostScript font what the widths of its characters are. A wizard can make a program that will print out their calibres and sidebearings. What is sometimes so hard as to be impossible is to find out exactly what rules a page make-up program applies when it does its equivalent of sending the line away: deciding when to turn a word over to the next line in justified setting. It can be equally difficult to change the interword space in ragged-right setting from the value defined in the font. Text-formatting programs do exist in which every parameter for the construction of a line of text – the normal value for interword spaces, their shrink and stretch limits in justified setting, extra space after punctuation, tramline widths for ragged-right setting – can be made explicit, but they too need wizards to control them.

Compositor or program, though, ragged-right or justified, the agent that sets the type is always at the mercy of the text. ‘Thorough’ cannot be broken, however much it might need to be. Burnhill is right in praising, and wishing for, a technology in which the consequences of that fact can be dealt with by hand in a quantitative way.

Face sizes and body sizes

It was a brilliant idea to measure the widths of risen spaces in Aldus’s books and use them to construct a schema of body sizes and character dimensions. In the roman of Constantinus Lascaris’s Greek primer, for example, Burnhill measures the proportions of x-height to capital-letter height to body as 4:7:12 (0.33:0.58:1) on a body size of 6.3 mm. In the newer type of the *De Aetna* the same proportions are 5:7:12 (0.42:0.58:1), on a body of 5.8 mm. He sees this five-twelfths canonical x-height as persisting in the italics of the Ovid and Seneca, although the cap height reduces to six units or half the body in both cases and the body size is around 4 mm.⁸

Measurements like these, which parallel those reported by Nicolas Barker, inevitably give rise to problems of interpretation.⁹ It is all too easy to forget that the only things to be seen on the pages of Aldus’s books are the marks left by the types from which they were printed. The types themselves are lost to us. Nor can we be certain about their exact size or spacing, because they were impressed on to dampened paper which will have shrunk by an unknown amount, and probably not uniformly, as it dried. This means that local measurements on the marks, over ranges of a centimetre or so, probably reflect reasonably accurately the dimensions of the antecedent types. Measurements over longer ranges become less and less reliable as their range increases. In Burnhill’s illustrations of the Ovid and Seneca pages, for example, there is a difference of almost two percent in the depth of twenty lines of text between the two: 78.5 as against 80 mm. Does this represent a real difference in the body size of the types, or is it a consequence of differential shrinkage in two batches of paper, or an artefact of the reproduction process?

There is also the question of what to measure. Burnhill’s illustrations show how much variation there is in the actual dimensions of the printed character images: compare for example isolated *o* with ligatured *no* and *mo* in the pages of his Figure 5. In the enlarged part of

8. 6.3 mm is 17.9 pt, 5.8 mm 16.5 pt, and 4 mm 11.4 pt Anglo-American.

9. See his *Aldus Manutius and the development of Greek script and type in the fifteenth century*, 2nd edn, New York: Fordham University Press, 1992.

the same illustration the calibres of *u* and ligatured *um* are indeed five times the width of the risen space, but *o* and the *e* of ligatured *ste* are 4.5 times: nine twenty-fourths rather than five twelfths of the body. Capital C, similarly, is more convincingly eleven twenty-fourths of the body than six twelfths. If the basic unit of the Aldine system is indeed one twenty-fourth of the body, then Burnhill's eight-to-em 'very thin' space is no longer an anomaly in his system.

There is nothing improbable in the idea of dividing a given body size into twelve or twenty-four parts in order to set the dimensions of a gauge that is subsequently used for punchcutting. Moxon, after all, tells us how to do it for forty-two parts 'with curious working', and his technique does not call for anything that would not have been available to Griffo or his contemporaries.¹⁰ But in late fifteenth-century type manufacture such sets of dimensional norms do not generalize beyond the contexts in which they were developed. Aldus was quite unusual in having his greek and hebrew types made in-house as well as his romans. Elsewhere the business of type manufacture was already becoming fragmented, with punchcutting and typesetting often carried on separately from printing. Harry Carter says of Aldus's contemporary Peter Schoeffer the younger that 'his matrices were distributed over a bigger area than any man's up to his lifetime' (he died in 1547) and that 'he introduces the modern era of typefounding in which a very few punchcutters supply the total demand'.¹¹ In a trade that sells sets of justified matrices without a mould, or sets of strikes to be justified by the purchaser, modular systems will find it hard to dictate the dimensions of an eventual type, even if they had been useful in cutting the punches for it.

Burnhill sees the Aldine norms he has discovered as 'a manageable and unified system of dimensional control ... applied at every level of linguistic order, including character image sizing'. But for the last of these the Aldine system as he interprets it is more limiting than he might like it to be in practice. A specimen of types probably by François Guyot, published in the Netherlands around 1565, shows three romans: a great primer on a body of 14 mm (39.8 pt), a double pica on 7.2 mm (20.5 pt) and a pica on 3.9 mm (11 pt) (figure 1). All three are known to have been used in 1547. Their proportions change with body size in the way we have come to expect of hand-cut type: the short letters get smaller and the descenders longer as the size increases. Although the capital-letter heights are roughly two-thirds of the body in all three sizes, neither their variations nor those of the x-heights will reduce to any simple submultiple of the body size.

Equally, the relationship between x-height and overall calibre is one of the factors that affects the voice with which a type speaks to its readers. In his *Manuel typographique* of 1763 Pierre-Simon Fournier specifies the ratio of x-height to body size as 3:7 (0.43:1), or 0.5:1 for a *gros œil* (large face) design. He is happy, though, to depart from his own specifications to achieve the typographic effects he wants. The calibres of small *o* in the seven romans he cut on *cicéro* (12 pt) body vary from 0.52 of the body for the *gros œil dans le goût Hollandois*, through 0.48 for the *gros œil* and 0.45 for the *ordinaire* and *œil moyen*, to 0.43 for the *petit œil*, *serré* and *poétique*. The last of these, with its small x-height and narrow set, was intended 'for works to which it is

10. *Mechanick exercises* (1683), in the section on lettercutting.

11. Harry Carter, *A view of early typography*, Oxford: Clarendon Press, 1969, p. 109. Schoeffer was the son of Gutenberg's foreman in 'the work of the books'.

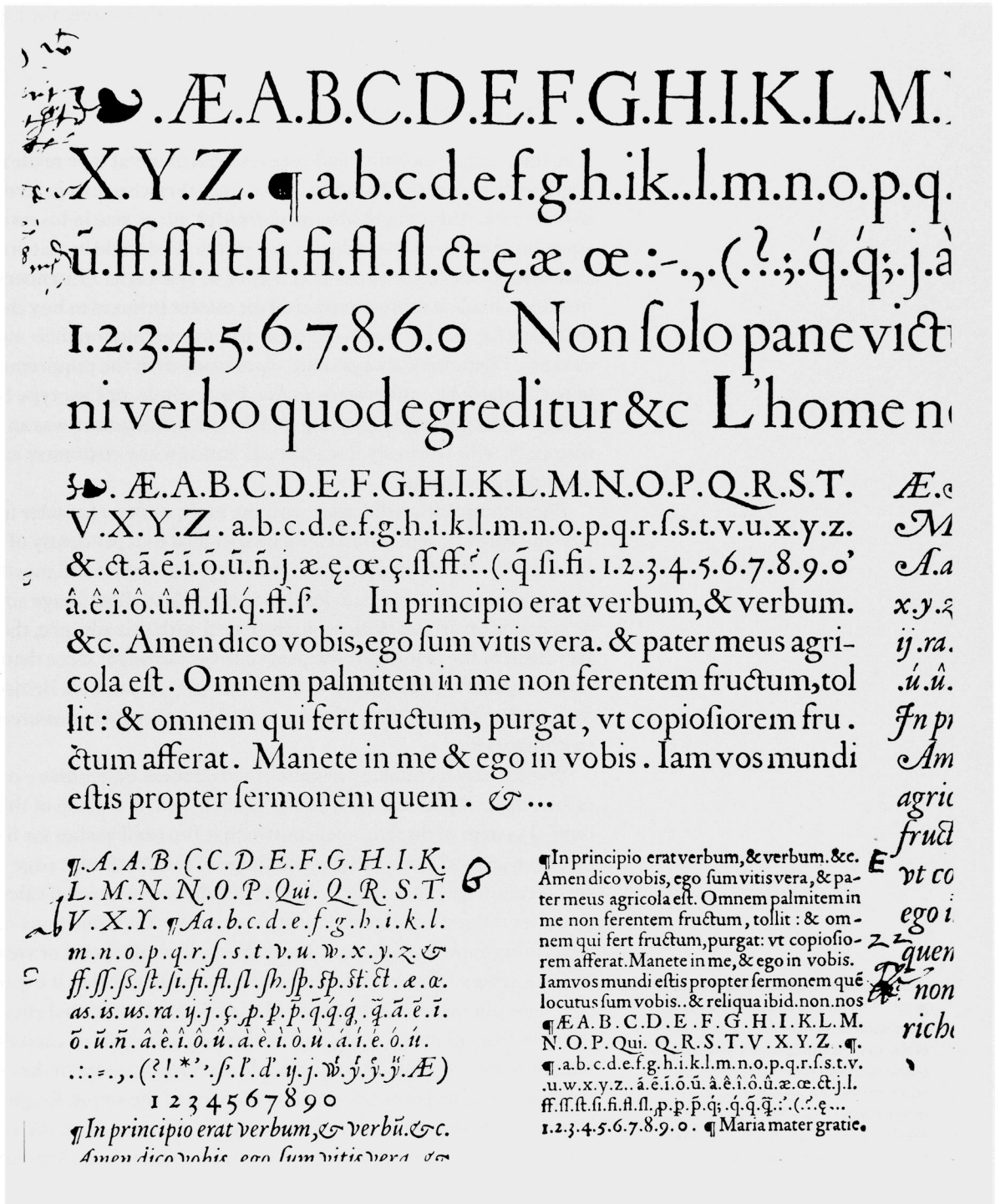


Figure 1. From: John Dreyfus (ed.), *Type specimen facsimiles 1–15*, London: Bowes & Bowes, 1963, sheet 1. Reduced to 84.7 per cent linear. The proportions of x-height to capital-letter height to body, measured from a scan of the facsimile at 48 samples per millimetre, are 0.41:0.66:1 for the pica, 0.40:0.68:1 for the double pica and 0.35:0.67:1 for the great primer.

desired to give an air of lightness by somewhat shortening the lines' as well as for setting poetry.¹²

Specifying image size

The three-dimensionality and concreteness of metal type made it impossible to specify character image size otherwise than in terms of body size. Aldus could impose norms for image size in his own shop, but not across the industry as a whole. The trade in matrices and strikes that began to develop fifty or so years after Gutenberg's invention made it more economical for master printers to buy the materials for making ready-cut type than to commission their own designs. There were always some types made to fit the requirements of particular jobs – the *romain du Roi*, for example, or Linotype Bell Gothic – but generally speaking metal-type manufacture was an oligopoly, with relatively few products and as many customers as possible for each one.

Photocomposition did away with the body, so that character image size and baseline separation could be specified independently of one another. By the early 1970s the technology, although it still mostly used photographic matrices, had developed enough to allow image sizes to be specified in arbitrary increments. Faced with this advance, the conservatism of the printing trade proved to be a stronger force than the rationalism of typographers. Which of us now remembers British Standard 4786:1972, *Specification for metric typographic measurement* (withdrawn)?

Present-day technology has abolished all these difficulties – or, rather, made it possible for them to be abolished. A version of the unified system of dimensional control that Burnhill wishes for has in fact been around since 1984, in the shape of the PostScript page specification language. PostScript makes all its dimensional calculations, for the sizes of character images as well as their positions on the page, in terms of a single unit. Its problem, from the point of view of a rational scheme for character image measurement, is that it expresses character dimensions as fractions of the height of a notional em square left over from metal type, instead of allowing x-heights or capital-letter heights to be specified directly. Simple arithmetic comes to the typographer's rescue; but it is sad that the battles of the 1970s, fought by Ernest Hoch and others to free typographic thinking from the shackles of outmoded technologies, are still not won in the new millennium.

12. *Fournier on typefounding* (1930), p. 170. The measurements were made from scans at 48 samples per millimetre of the 1995 facsimile of the *Manuel typographique*. Both these books form part of: Pierre-Simon Fournier, *Manuel typographique* [1764 & 1766], ed. James Mosley, 3 vols, Darmstadt: Technische Hochschule Darmstadt, 1995.

Burnhill's type spaces, Noordzij's Hamburg thesis, Hoch's criterion

Peter Enneson

It is curious that Peter Burnhill's research into Aldine typographic norms should have been given its inaugural ride into the public eye as a strike against Gerrit Noordzij's dictum that typography is 'writing with prefabricated letters'. The existence of graduated type spaces in printing technologies is a good deal more tangential to the writing/typography question than Burnhill's introduction to his findings might make it seem.

Noordzij's dictum is the principal tenet of what he once proposed as 'The Hamburg Thesis'. This stated: 'a. Typography is writing with prefabricated letters. b. The criteria for typedesign and typography come from handwriting; c. Typography is learned in handwriting.'¹ Noordzij went on to comment: 'This thesis cannot be neglected. It can be rejected, but not without engagement ...' Like Robin Kinross in his 'Type as critique', Burnhill engages with proposition *a* of this thesis, and, by extension, the whole thesis of which it is part.

Burnhill's touchstone in engaging with this principle tenet of Noordzij's thesis is Ernest Hoch's criterion. Hoch's criterion has a bearing on qualitative differences between print and writing. Hoch's criterion for 'print' is 'the existence of [...] an "image carrier" that allows large numbers of near-identical images to be produced from it [...]. [A]ll forms of print are qualitatively different from writing in that one basic respect. Examination of the image character allows us to forecast the content of the image to be printed.'²

Is *the existence* of an image carrier a qualitative matter, or is *what the existence of an image character affords* a qualitative matter? Perhaps the latter. Qualitative analysis is the analysis of a substance in order to ascertain the nature of its constituents.³ It might make sense to say that the image carrier is a *technical* or *mechanical* constituent, and that mechanical or technical peculiarities introduce *structural requirements*, like the use of graduated type spaces. Then the ability to forecast content in printing technologies, the near identity of images produced, might be considered qualitative characteristics properly so called. They have to do with the nature of the constituents. Are qualitative differences properly basic? Probably not. Qualitative differences, technical/mechanical differences, differences in structural requirements between the devices and technologies used in generating pieces of visible language, i.e. differences at the level of type spaces, cannot, it seems to me, erase the *phenomenological* continuities and *historical* dependencies that link typography with the technologies of (hand)writing that predate and feed it. It is the continuities and dependencies that Noordzij's thesis serves to highlight.

Is there a better word than 'writing' in our lexicon to do the kind of work Noordzij wants his charged sentence to do? In Noordzij's pattern of usage writing is a generic term. It names the category of which typography and handwriting are subsets. 'If the different words writing and handwriting cannot carry different meanings, the category of writing needs a new label.'⁴ Indeed, writing names a category, but the issue is not in the end, categorical and definitional. The issue is pedagogical and perspectival: Noordzij's dictum opens a world of meaning. The

1. 'The Hamburg thesis', *Letterletter* (Münchenstein: ATypI), no. 2, 1985, [p. 3]. Commenting on this in an email to me (15.9.2000), Noordzij wrote: 'The [Hamburg Thesis] statements have the typical flavour of the inventions *ad hoc* that made my lessons exciting for both parties. I intended my inventions as stepping stones that could persuade a student to move away to another point of view. If you can only imagine type as derived from metal objects, it might be enlightening to see it for a moment as prefabricated handwriting. Detached from the original event they could become new learning.'

2. See Ernest Hoch, 'Commentary: linguistics, "writing", and typography', *The Journal of Typographic Research*, vol. 2, no. 4, p. 380. Compare Hoch's use of the term 'image carrier' with Southall's related but distinct use of the same term in 'A survey of type design techniques before 1978', *Typography Papers*, no.2, 1997, p. 32.

3. *The Random House Dictionary of the English Language*, College Edition, 1968.

4. The comment is from an unpublished series of notes entitled 'Index of arguments' sent to me by Noordzij. Quoted with permission.

real dangers in discussions of typography and writing are a definitional shackling of language where it becomes hazardous to say anything at all, the magnification of differences into categorical distinctions, a hermeneutics of suspicion.

Typography is a grid (Anthony Froshaug);⁵ Typography places signs (Hanno Eshes / K Winterhager);⁶ Typography is writing with prefabricated letters (Gerrit Noordzij); Typography is writing in a straight-jacket (Alan Fletcher).⁷ Each of these sentences – and many more besides – can easily be misconstrued, their logic made to seem questionable. Yet each of them highlights aspects of the craft. They are ‘doors of perception’.⁸ I would hate to have to dispense with any of them. In his “Writing” and “alphabet” John Mountford writes ‘Sometimes, [in our use of the word “writing”] the handwriting sense obtrudes and makes us hesitant to affirm that typography is concerned with writing. Yet it is.’⁹ Could it be that Burnhill’s hesitations about Noordzij’s inventions, fed by Robin Kinross’s questions about their possible shortcomings,¹⁰ have more to do with suspicions roused by obtrusion of ‘the handwriting sense’ than with Noordzij’s actual equations and intentions. Burnhill: Noordzij ‘equates typography with letters of the alphabet, seemingly not recognizing Hoch’s image carrier’; Noordzij’s analysis ‘would appear to limit the practice of typography to that of a specialist in well-crafted handwriting.’

Noordzij, *De streek: theorie van het schrift*:

‘The white of the word is my only holdfast.’

‘The various kinds of writing with their various constructions and their various strokes can be compared with each other only in terms of the white of the word – every comparison requires a comparand that makes things comparable. The white of the word is the only thing all the various kinds of writing have in common. This universal vantage point holds for handwriting and typography alike, for ancient writing as well as modern writing, for western writing as well as the writing of other cultures, in short, it holds for writing.’

‘The universal vantage point that renders handwriting and typographical letters comparable is not to be found in the black of the letter. The black of a typographical letter is so different from the black of a handwritten letter that as strict comparatives they appear incommensurate.’¹¹

Noordzij, ‘Het domien van de typograaf’:

‘... typography comes down to a careful management of the white. Readability is anchored in a hierarchy of white. ... word, line, heading, column, margin.’¹²

Would greater familiarity with Noordzij’s writings have dispelled a few of Burnhill’s apprehensions, explained the apparent shortcomings, induced Burnhill to bring Noordzij into the discussion in a more constructive way? Clearly language is a barrier. But side by side with Froshaug’s notion of typographic norms, Noordzij’s arresting notional matrix might provide discussions of typographic grids, spaces, sub-modular control and dimensional co-ordination with the conceptual bedrock they need to hit their stride in the digital era.

5. This is the title of an essay by Anthony Froshaug, published first in *The Designer*, no. 167, 1967, pp. 4–5, and reprinted in Robin Kinross (ed.), *Anthony Froshaug: typography & texts*, London: Hyphen Press, 2000, pp. 187–90.

6. The phrase is from Hanno H.J. Eshes, *Semiotic foundation of typography* (‘Design Papers’ no. 1), Halifax NS: Nova Scotia College of Art and Design, 1976, p. 23. Eshes is alluding to K. Winterhager’s definition of ‘typography’ as to “place signs” or to set type.’

7. I am not sure where I came across this reference, presumably it comes from a published interview. I have been unable to track it down.

8. This phrase is the title of Harry Duncan’s book: *Doors of perception* (Austin TX, 1987). I discovered this work from its inclusion in the bibliography of books on ‘typographical aesthetics’ in Robert Bringhurst’s *The elements of typographic style* (Vancouver: Hartley & Marks, 1992, p. 243).

9. See John Mountford, “Writing” and “alphabet”, *The Journal of Typographic Research*, vol. 2, no. 3, 1968, p. 222.

10. Robin Kinross, ‘Type as critique’, *Typography Papers*, no. 2, 1997, p. 85.

11. Translated from: Gerrit Noordzij, *De streek: theorie van het schrift*, Leersum: ICS Nederland, 1991, at pp. 9–10.

12. Translated from: Gerrit Noordzij, ‘Het domein van de typograaf’, *De Gids*, no. 4–5, 1993, pp. 267–80, at pp. 277–8.

The Aldus research and its implications

It would be remarkable if the graduated system of type spaces devised by Griffo were indeed used as gauging devices for the fixing of the primary dimensional attributes of the character sets. Burnhill's presumption that combinations of spacing sorts might have served as a gauge in determinations of x-height, cap height, height of ascender above x-height, depth of descender below base-line – a gauge across fonts, no less – has an immediate appeal to anyone vexed by the anomalies surrounding meaningful gauging of relative font sizes. And, as Burnhill's account suggests, such dimensional co-ordination puts an interesting face on subsequent typographic history.

Using combinations of type spaces as a dimensional gauges is one thing, but I wonder about the following: (1) is dimensional co-ordination across the x/y axis as thoroughgoing and tight in the Aldine practice as Burnhill's measurements, calculations and templates make it seem; and (2) is the kind of thoroughgoing dimensional co-ordination Burnhill appears to have confirmed in the infancy days of writing with prefabricated letters a goal worth striving for in these now adolescent days of digital practice.

1. *The Aldus research*

Burnhill's conclusions are based on measurements of inked impressions on absorbent surfaces. They are not supported by anecdotal evidence, or so it seems from the information Burnhill has provided us with so far. His hypothesis is that primary dimensional attributes were gauged in multiples of the submodular twelfth. Burnhill's findings suggest the existence of a 'very thin' space 1.5 times the submodular twelfth. The 'very thin' space plays a critical role in Burnhill's hypothesis. Is the demi-increment anomalous? Does the existence of the non-simple multiple [1.5] weaken Burnhill's determinations? Is the evidence for the very thin space an evidence of raised spaces?

What are the margins of error in extracting measurements from unsharp offprints?

Burnhill's templates are positioned relative to the baseline and the x-height. In many of the reproduced examples, this places the top and bottom of the type body on the demi-increment. How might a vertical .5 shift in the position of the template in these examples alter our perceptions?

Burnhill's central concerns are 'Griffo's grid' and 'Aldine typographic norms'. Is Griffo's grid as well-defined as Burnhill's templates make it seem? What grid there is, is there by dint of gauging practices – that is, is tacit. Is there a system of typographic norms? If by that we mean a non-arbitrarily graduated series of dimensional standards, we might want to say that there is a dimensional scheme but not necessarily a metric. Has Burnhill divined them correctly? Are Burnhill's templates proof? Perhaps. Perhaps not. Burnhill would surely acknowledge this. His determinations are, nevertheless, suggestive.

2. *Implications*

In Griffo's practice, as Burnhill imagines it, the gauge for dimensional attributes of the font and for dimensional co-ordination of the corpus

comes from somewhere inside the system. This is salutary. Given Griffo's gauging practices – if indeed they are what Burnhill thinks they are – Burnhill is troubled by the apparent anomaly of not being able to state with precision the printed image size of characters relative to the line increment. But what does the ability to state with precision the printed image size relative to the line increment actually give us? The ability to define algorithms for typographic excellence? And how do we define printed image sizes in such a way that they provide a *meaningful handle* on character size? Do we take our cue for character size from the capital letter height? the x-height? the distance from bottom of descender to top of ascender? a combination? relative values? Do we factor in the pixel counts or gauge amounts of data ink?¹³

It would appear that specifying type size and dimensional gauging of letterforms are different matters. Dimensional gauging measures an array of variables, including width, weight and relative contrast. They are telling in combination. However, the choice of one over the other as a size denominator is essentially arbitrary. As things now stand, the nominal size is the scalar depth of the character field. The type designer adjusts his letterforms to the character field in such a way that, in relation to other fillers of say, the 10 point slot, his type has the characteristics he wants for it: a large 10 point; a 10 point workhorse; a fine 10 point, a 10 point with large x-height and a narrow set size. This, at least, provides the experienced user with an accessible handle.

For typography, the sizes of the increments in the metric are the operative dimension. Would I prefer to be able to increase my type size by percentages of the em? In millimetre increments? Or are points, demi-points, quarters of a point, and tenths OK? Why should the increments used for increasing line feed and for gauging type size correlate with those used for kerning and tracking?

Why do we want a unified system of dimensional control, 'functioning industry-wide at every level of order'? For the sake of simplicity? So we can speak the same language? Interchange fonts more easily? Compare and contrast on a level playing field? Does co-ordinating dimensions relative to a graduated dimensional system guarantee good design? Do the laws of good gestalts converge with the logic of simple multiples coordinated across the x and y axis of a typeface. Is the typeface that has the level of submodular co-ordination that Burnhill envisions intrinsically better or more practical than the one that doesn't. If (following Noordzij) the size and orientation of the counterpoint is my touchstone and the white of the word my gauge in the design of a typeface and in the setting of a page or column of type, do the exact dimensional coordinates on a vertical / horizontal axis ultimately matter?

Rogue questions. They are not altogether new. However, Burnhill's beliefs about Aldine practice and the advent of our softer-than-lead virtual character fields raise them afresh.¹⁴ A system is a social contract; the decision to work within it is now more than ever, discretionary.

Using a virtual simulacrum of Burnhill's mould aperture, the font creation softwares that I know gauge type size on a point system, gauge spacing according to standardized em units or percentages. How I fill the character field, what dimensional ruses I enlist to help me, is my business. I can redefine the metrics of any software I choose to work

13. On the notion of data ink, see: Edward R. Tufte, *The visual display of quantitative information*, Cheshire CT: Graphics Press, 1983.

14. See Burnhill's 'Type spaces' figure 2 for this terminology.

with. I can, but I do not have to. The spaces we work within offer endless possibilities for subdivision and redefinition. We can choose simple ratios or adapt Le Corbusier's moduler. There is no universal typographical constant. No fixed typographical dew point. For each face I design, for every typographical livery I deliver, for every space I am asked to work within, I can select a metric and a graduated system of parameters unique to it; a grid. The dimensions of the pixel, functional constraints (to the extent I choose to embrace them), and my own inventiveness are my horizons.

Andrew Boag

As students we learned that Fournier developed the point system of typographic measurement around 1737: a system which proposed that all type body sizes be measured using multiples of a base unit – that unit being one twelfth of an inch. It is not so long ago that James Mosley presented us with the evidence to show that in fact such a system was developed by Jean Truchet, one of a small group of members of the French Royal Academy of Sciences, some forty or so years earlier.

Earlier printers obtained type from external sources, often by purchasing punches or strikes from a variety of places: there was therefore no opportunity for standardizing mould sizes, or indeed for relating them to character dimensions. Indeed, the lack of standardization meant that types from one printer or founder could not be used in combination with those of another: in this way printers and founders protected their own interests. Thus when I first read Peter Burnhill's piece – rather quickly on a train immediately after receiving the advance copy – I was sceptical. On more thorough reading, however, I began to appreciate that – as Burnhill makes clear – it is the very fact that Aldus was such a pioneering early printer that makes his theory so convincing. Mosley (1997: 12) notes that Fournier claimed that

he had made order out of chaos and introduced a system 'where previously it had never prevailed'. But at the same time, he was unwilling to tie his notional 'point', or subdivision of the *ligne*, unequivocally to any prevailing unit of measurement. François-Ambroise Didot, Didot l'ainé, did just this, by making his point one sixth of the *ligne géométrique*, that is, an official standard unit. Truchet had anticipated both Fournier and Didot in certain respects: Fournier by relating his unit so far as practicable to bodies in current use, and Didot by using a precise and quantifiable unit of measurement.

Kula (1986: 115) suggests that since the end of the ancient world, in its quest for metrological standardization, Europe has experienced three major waves of activity: the Carolingian, the Renaissance, and the Enlightenment. Truchet, working in 1692, was a product of the Enlightenment, with its emphasis on reason, scientific enquiry, and rationalization. The Enlightenment wave eventually culminated in the metric system which was given legal status in France in 1801 (though it is interesting to note that this grand plan was itself foreshadowed by the blueprint for a 'universal and invariable measure' put forward by La Condamine of the Academy of Sciences (Kula 1986: 177)). It was this

rationalism which drove the need to develop both a system of relationships, and the relationship of this system to a precise unit of measurement. Indeed, this sub-wave of Enlightenment typographic measurement reform culminated in Firmin Didot's attempted revision of his father's system in 1812 to bring it into line with the metric system.

The Renaissance had also emphasized rationality but from an absolutist perspective. Measurement reforms from this wave attempted to bring standardization throughout individual kingdoms. Kula (1986: 117) notes that there were reforms in Spain (under Philip II), France (under Francis I), Lombardy, and the Savoy.

And we are now given to understand, thanks to Burnhill's remarkable enlargements, that a rational system of typographic relationships, albeit in-house, was devised at this time.

Aldus's use of a duodecimal system is not surprising for the reasons that Burnhill states. Such systems have been common in the history of measurement. Kula, for example, notes that 'we come across the decimal grouping less often than duodecimal, sexdecimal, vigesimal, or even quadragesimal and sexagesimal; the basic units are very large, hard to apprehend as entities, but marvelously divisible' (1986: 83). Given the Renaissance wave, with its emphasis on rationality, an Aldine system makes perfect sense.

Though the Enlightenment related the system to the precise unit, the significance of both the Enlightenment and Renaissance approaches is the underlying system. Indeed, this is why Fournier's system is admired even though it wasn't based on a precise and quantifiable unit. Many confuse the efforts of the International Organization for Standardization (ISO) to reform typographic measurement in the 1970s with the issue of metrication. Driving their efforts was not metrication, but the desire to change the way type is measured (though this did go hand-in-hand with the notion that the metric system ought to be adopted, in order to eradicate the continued use of a number of conflicting measuring systems across the industry). Fundamental to their proposals was the desire to measure type according to a system based on the visible character image, rather than on non-existent body sizes. Admirable though this was, it provided no means for the specification of relative units either vertically, or, more importantly, horizontally.

Some would argue that the millimetre is not an appropriate unit for the measurement of type. The systematic division of the em square is what is crucial: how these divisions are then measured is of little significance. Proof that Aldus recognized this just a few decades after the invention of the adjustable mould would be breathtaking.

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Hrant Papazian

What is the difference between writing and type? In his article Peter Burnhill cites an exchange between a linguist and a typographer that hints at the complexities of this question. To arrive at a meaningful answer we must first make a pledge: to avoid falling into the cloying world of terminological pedantry, and to instead work towards practical conclusions that can improve the craft of type design. After all, a printer's flower by any other name would smell as sweet – if we could smell shapes.

Type has a qualitative advantage over writing: it is not restricted by the movements that the human hand is attuned to making. As such, a letterform of type is not a byproduct of the process of writing by hand using a given implement; it is a *shape* that can enjoy full abstraction and minute detailing. This advantage should not be disregarded, and continuing to make typefaces that celebrate handwritten forms is a shameful waste of type's true potential. Note that this does not imply the wholesale abandonment of the influence of the hand in type: pragmatism dictates that for a typeface to function properly the existing precedent of expectations must be taken into account. However, an understanding that artefacts of the hand are for now a 'necessary evil' in type is critical to the healthy evolution of typography, and our eventual liberation from the tyranny of the hand.

One interesting aspect of this discussion is that the related notions of 'image carrier' and 'prefabricated letter' have actually been outdated for over a century: there have been two major shifts in type design since those notions were valid. L.B. Benton's pantographic punchcutting machine – patented in 1885 – caused the first profound change. Before the pantograph, type designers did indeed make prefabricated letters, at a given physical size. But the pantograph enabled the design of conceptual, size-independent letterforms: *glyphs*. The design of glyphs continued practically unchanged into phototyping and subsequently into computer-based typography. The second shift occurred when computer software was used to define variable glyphs of a single letter. Van Rossum and Van Blokland's Beowulf font (1990) is a prime example of this. On the surface this shift seems to bring type back towards handwriting, since letterform variability is introduced. However, the fact that the variability is consciously controlled means that this technology actually raises type further above and beyond handwriting, giving it new qualities of functionality and power that the hand can simply never attain.