Developing an awareness of typographic letterforms

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SUMMARY

This paper examines the rôle of letterforms as a means of communication, starting with hand-set metal type and mechanical typesetting in hot metal. Present-day techniques of phototypesetting, and of digital typesetting, via cathode-ray tube and laser machines, are also discussed. Careful attention is paid to the cultural impact of these techniques, with particular reference to traditional French typefaces which often have small x-height and very thin hairlines (which can disappear at small point sizes). Reference is also made to the impact of each of these modern typesetting methods on both 'informational' and 'cultural' texts.

A strong argument is presented that a nation's typefaces encapsulate its national spirit and its culture. For this reason, it is regrettable that the advent of laser-driven imaging devices has brought with it an 'anglicization' of many fonts, via an increase in x-height, and a reluctance to countenance a non-linear variation of letterforms and set-width with point size — a characteristic so crucial to the readability of classic texts. A plea is made for the rapidly developing computer technology to be deployed in the interests of *quality* as well as *quantity*. Modern techniques have all the advantages of photographic sharpness but this must be harnessed to the traditional subtleties of the original typeface design if the intentions, and the cultural identity, of the typeface designer are to be truly respected.

KEY WORDS Typographic 'writing'   Functions   Technique   Visibility   Legibility   Cultural identity
                        Picture-words

1 INTRODUCTION

After the last war in Europe the need to exchange ideas and communicate in the renascent industrial world grew so fast that the traditional framework of society and the geographical, political and cultural frontiers were broken down. To meet these unprecedented new demands, new techniques were developed, completely changing the known means of communication. However, despite the novel 'images' from the new technologies of radio and television, writing remains a special means of communication in the modern world.

After 30 000 years of signs and symbols — painted or carved — 4 000 years of handwriting and 500 years of typography, phototypesetting, which had long been dreamed of, finally found a suitable climate in which to emerge, to develop and to go into production on an industrial scale

The first phototypesetters began operating barely thirty years ago, since which time the technology of the letterform has constantly evolved in successive leaps. Initially, electromechanical phototypesetting was developed, using a photographic negative, on

film or glass, as the source of a font of characters. After that came typesetting on cathode-ray tubes, laser typesetting using electronic digital fonts and the possibility of rendering letterforms on computer workstations — not to mention the possibility of producing multiple copies of all this material on high-speed printing-presses.

Today, machines can read printed texts and manuscripts or take dictation; they can correct, translate, scan, condense, manipulate, compose (in a wide variety of fonts which they stretch and distort at will) and arrange material. All of this can be done at dizzying speed so as to reconstitute printed pages for us, sometimes at a great distance over computer networks.

In this rapid acceleration of new writing techniques, let us pause to get our breath, take stock and question the eventual implications that these techniques could hold for our letterforms, for the process of reading and for us as readers. In this pursuit of quantity, with which we seem obsessed, what place remains for what we used to call typographic quality? Is it still there to ensure that the author's thoughts are well transmitted, or has it become a useless luxury belonging to the past? The dilemma of quantity versus quality is an age-old problem, well known to typographers and one which marked the very birth of typography.

2   THE DILEMMA OF QUANTITY VERSUS QUALITY

When typography first arrived on the scene, in the middle of the fifteenth century, it faced fierce opposition until typographers mastered their new tools and passed from industrial imitation of the production of ancient manuscripts to a new and independent language: the language of typography.

Just as the scribe adjusted the shape of his letterform according to its eventual destination and the way it would be read, so also did the punch-cutter carve his letters for every print-size, aware of the need to compensate for the rigidity of the unique shapes cast in metal, and aware of the need to accommodate the reader's eye.

Basically, with varying levels of refinement, the technique of typographic letterforms and printed texts remained the same for more than four centuries. Suddenly, towards the middle of the nineteenth century, the emerging industrial society had to meet unprecedented new demands in handling the spread of new ideas about society, politics and religion together with the training of the workforce required by the new industries. In turn this gave rise to a need for *educating* the population — if only to understand the advertisements promoting the new goods produced by those selfsame industries!

To meet this new demand for *quantity* the new industrial age invented new machines: first of all faster printing-presses, then machines for typecasting, typesetting and distributing matrices. After innumerable attempts to mechanize typesetting, the eventual machines for slug-casting and typecasting finally opened the way for the extraordinary expansion of the modern printing-press and book publishing. To feed the new machines with a sufficient quantity of matrices, the manual cutting of punches was replaced by pantographic machinery. However, with the coming of the new technology the dilemma of *quantity* versus *quality* resurfaced with a vengeance. All this happened a century ago.

Pantographs cutting several matrix bodies (i.e. several sizes of type) based on one single letter model, made the traditional shapes more rigid and put an end to any careful adjustment. The restrictions imposed by the system of matrices for casting slugs made it impossible to have kerned letters (i.e letters projecting beyond the body of the type). The

use of duplex matrices, in which two different letterforms — roman and italic — were forced to have the same widths, destroyed the rhythmic unity of the words (traditional italic typefaces were usually narrower than the roman).

This degradation of traditional typographic quality went so far that it aroused vigorous and widespread protest at the time. However, economic reasons prevailed and gradually no more was heard about it. Moreover, this technology, once so decried by lovers of good typography, served as a reference point for most of the first-generation photo-typesetters, a fact which has numerous consequences for us today.

3 PHOTOTYPESETTING

With the arrival of phototypesetting, typography was freed from the constraints imposed by metal and could embark on a new era of expansion. No more punches to be cut, no more striking of matrices, no more storage of tonnes of set type ready for future reprints. Other advantages included the removal of restrictions on kerned letters (see Figure 1) and on width and spacing. With phototype being printed by offset all the distortion problems caused by pressure on the paper, or by the inking process, were removed. However, beset by problems of quantity and economy, and often out of ignorance of the real problems, typography in the hands of the engineer did not benefit from what could have been the positive features of the new technology. The letterform itself was neglected, because it had ceased to be a source of profit as it had been when metal type was sold by the kilo. The only thing sold was technology.
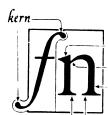

Figure 1. A kerned pair of letters

Instead of inspiring new designs, thanks to the new production facilities afforded by phototypesetting, font design was more or less at a standstill for twenty years. Neverthe-less the phototypesetter machines should have been able to offer users the customary range of typefaces to ease the suddenness of the change from metal. As it was, short of time, the phototypesetter manufacturers had to produce large font libraries in a hurry and these were made up from photographic copies of typefaces originally designed for cast-ing in metal. Obviously these copies, which were not adapted for phototypesetting, brought with them all the defects inherent in their origins and took on the additional con-straints of phototypesetting.

From the very beginning, thanks to the possibilities of enlarging and reducing, a single design was adopted for all the point sizes, a radical break from the optical adjustment of designs which typographers had hitherto considered essential for legibility — the prime aim of any script [1].

But what is *legibility*? Is that what typographic quality really is? The concept of quality is not completely static in our minds. Like everything else it undergoes a certain amount of evolution. Let us bear in mind that for five centuries typographers were

constantly seeking quality in the form of the sharpest possible impression. They perfected the inking and the pressure on the paper, and they invented the most perfect papers as well as new printing-presses. Then there came the second generation of phototypesetters with photographic quality of the letters printed by offset, without pressure on the paper or ink smudges: the *nec plus ultra*. Curiously, this new quality of the letterform image, sharp and without smudges, hardly aroused any enthusiasm in the beginning. It was thought to be rather cold and soulless. Suddenly, new virtues were rediscovered in the old technology, like the smell of the printing ink, the feel of the paper and the human warmth of a craft industry.

Then electronic digital phototypesetting arrived, carried out either by a cathode-ray tube or by a laser beam. Both of these methods give a rather ragged appearance to the contours of the letters and so there was an abrupt change of heart. The god rejected in former days was once again firmly in favour and the sharpness of the image of the second-generation machines became the new reference point and, moreover, the very criterion of quality.

Drawn into a whirlpool of technology, the printer has, in all truth, lost the idea of quality. Having lost any confidence in his own eyes as a reader or in his own judgement he entrusts the definition of typographic quality to instruments such as the line-counter and densitometer (though a different viewpoint can be found in the article by Bigelow and Day [2]).

4   TWO APPROACHES: BOOKS AND COMPUTERS

The production of written texts today can be divided into two main categories, the boundaries of which are often ill-defined. On the one hand there are the so-called *cultural*, traditional 'book' texts, destined to contain and disseminate thought on a range of subjects: poetry and literature, history, religion, philosophy, education, science, society, economics, games and so on. These 'book' texts, as far as their typography is concerned, are produced nowadays, with very few exceptions, by electronic digital typesetting on cathode-ray tube or laser machines.

On the other hand we also have *informational* texts which we read every day in our professional lives, and which may even constitute the major part of our reading. These texts occur frequently in organizations involved in activities such as industrial production, commerce, management, accounts and actuarial work; they are particularly common in the sections of those organizations that are concerned with administration, research, and documentation. Increasingly, these informational texts (and many of the cultural ones also) are prepared on a computer using word-processor software. The computer is capable of processing the information for dissemination via paper, telex, facsimile (telefax) or videotext. Whether on screen or on paper, the technology grows daily more complex and tries to compare itself with, and even substitute for, the classic phototypesetting that I have designated 'cultural'.

Certainly the aesthetic qualities and legibility of computer letterforms, on screen or on paper, are in no way comparable with those offered by phototypesetting: nevertheless they are accepted, more or less, in spite of grave doubts among some users. They are now an inbuilt feature of these tools which we use, however constricting we find them.

It is important to remember here that these informational texts, produced in a day-to-day manner and distinguishable by their ephemeral nature have not been taken under the

wing of typography in the past. They have never used book letterforms, being handwritten until the invention of the typewriter, which, it must be said, has never claimed to be a substitute for typography [3].

Despite the enormous progress in the field of computer letterforms, certain technologies have lagged behind. The French *Minitel* system, and some other videotext schemes in widespread use among the general public, put out such wretched letterforms that they are an insult to the reader as well as to our cultural traditions. Moreover, this technology has turned out to be uneconomic and totally inefficient in certain fields, such as the 'yellow pages' of the directory, for which it was initially intended.

5 THE INFLUENCE OF TECHNIQUE

Very often attempts are made to justify the low standard of the letterforms on video screens by claiming that this is the price we have to pay for progress. This new technology (which is already old) generates more schematic and functional shapes while scornfully rejecting the expressive movements of those very typographic letterforms that it tries to imitate.

At first sight it is tempting to say that the shapes of any writing are the direct result of the surfaces, the tools and the techniques employed. This is an old idea which has been much repeated. Yet the whole history of letterforms since the Romans 2000 years ago shows the exact opposite. We have, in fact, seen the most varied forms executed on the same surface with the same instruments:

● *on stone*: a full range of geometric lineals (sans serifs) and monumentals imbued with a subtle suggestion of movement, and even going as far as calligraphic designs ornamented with a final flourish.

● *on papyrus*: as well as on parchment and on paper, we have seen the evolution of letterforms for books as well as for everyday use, ranging from capitals written (with an oblique axis of thick-thin contrast) to early lower-case and uncials (with a vertical axis) returning to the oblique axis for Carolingian minuscules (see Figures 2–4). Such changes in form and axis were not in any way compelled by technical necessity. One could also point to the achievements of the techniques of cutting punches and casting type, which, over five centuries, have given us the whole range of typefaces. Later on, using lithographic stones and plates we find any number of strong lineal designs, heavy egyptians, romantic initials and 'copper-plate' scripts. Finally, using digital phototypesetting by cathode-ray tube or by laser, any combination of the above may be created as desired.

It is difficult, therefore, to accept the mechanistic theories of letterforms, for if the surface and the tool were the determinants of the shape of the letters, there would be no other styles other than those of surface or writing tool, whose servant the writer would then be: the instrument of his instruments.

In fact, on every occasion, *societies choose the surfaces and invent adequate techniques* whenever necessary, to make use of the forms which best meet the needs of each new function. The techniques of the letterforms, or the way the pens were cut, have never been the *causes* but, rather, the *chosen means* of meeting the needs of the various functions of the texts. We can see that the major changes in the shapes of letterforms have always been produced independently of any radical technological changes.

ILLANOCTESACE
STAGNISADSUP
NONSICUTTENEBRA
SURGENSOCEANO

Figure 2. Handwritten capitals with an oblique axis

TRANSICRUNTIORDANE
CTABICRUNTTOTAMPRAE
TENSURAM CTUENERUN
INCASTRAMADIAM CT

Figure 3. Primitive minuscules. 3rd century. Vertical axis

Cumautemaudisseth
nestraditureffet fecerfitingalil
Erelictaciuitatenazareth uenite
naum martamamunfinib:zabulo

Figure 4. Uncials with vertical axis and Carolingian minuscules with oblique axis on the same document

To illustrate this point more clearly, let us consider the advent of the Carolingian minuscule, imposed by imperial decree on all the monasteries and schools of Charlemagne's empire, with no technological change whatsoever. The evolution of the Carolingian into two opposing movements or expressions: the heavy, vertical and severe *Gothic* letterform, in the north, and the round and sensual *Humanist* in the south of Europe, both written on the same surfaces and with the same instruments, cannot be accounted for by any reasons stemming from materials or techniques. Conversely, the technological revolution which radically altered the whole business of printing and distributing books, namely the invention of printing, had no noticeable effect on either the book or the book letterform. The *Gothic* style, copied with the utmost care by the punchcutters of Germany, and the *Humanist* style used in Italy, both came through this veritable revolution without the slightest damage (Figures 5 and 6). And much later, after four centuries of virtually unchanged craftsmanship, the second technological revolution which occurred towards the end of the nineteenth century, with the invention of mechanical punch-cutting and typecasting machines, left the structure of our letterforms equally untouched [4].

Nearer our own time we can say the same of the third industrial revolution spanning

Post hec aperuit iob os suum
maledixit diei suo: & locutus
Pereat dies in qua nat9 sum : & n
in qua dictu est concept9 est homo.
es illa uertetur in tenebras. Ro re

Figure 5. Gothic 15th century

noftri clementiam fupplices ob
expugnet impugnantes nos.m
plicet deuotione ac dilectione
fuum que ad oftendendas diui
ecclefie uoluit prefidere.fuffic

Figure 6. Humanist 15th century

the technologies of electromechanical phototypesetting in the 1950s and 1960s, phototypesetting (by cathode-ray tube or laser) and the use of high-speed printing-presses. These sophisticated technologies have eliminated all physical 'image carriers' for the fonts of letters and, at the same time, all the accompanying restrictions. Nevertheless we still have *Times*, a variant of the sixteenth-century *Plantin*, which was adapted for use in printing fifty years ago and which is the clear leader in the field of book and newspaper production in the western world.

One could continue giving examples indefinitely to disprove the mechanistic theory of the determining influence of techniques on the shapes of letterforms. This theory, far from being harmless, seems to me dangerous, insofar as it leads to acceptance of the most degraded shapes, as if it were a question of fate, for the sake of technical necessity and 'progress', thereby disguising the reasons for a choice that dare not speak its name. It seems obvious to me that design is a *cosa mentale* — all in the mind — and that techniques are always the result of choice as we meet new demands and bring our dreams to reality. Techniques have never had a *direct* influence and have never caused us to doubt existing shapes insofar as we had mastered them. On the contrary, I believe it cannot be denied that new techniques of producing letterforms have always had a conservative and reassuring effect.

However, given that there is no direct relationship of cause and effect between the techniques and the shapes of the letters, it is equally evident that new techniques fashion the thinking and psychology of man, in a slow evolution. This leads him to make other choices, which are expressed in all his actions and in all his forms of creativity, not just in the shapes of letters but also in pictures, architecture, clothes and other ways. Man, as a subordinate of Matter and Mind, will always express these relationships in accordance with the criteria and values established by the period in which he lives.

6 THE FUNCTION OF THE LETTERFORM AND WORD SHAPE

We know that our letterforms are the visible and material form of the spoken language, with which they have a special relationship. As far as the spoken language is concerned, within any given culture, we know that one's expression is personalized, regardless of one's accent, by the pitch, intonation, intensity of the voice and rhythm of the speech. When accompanied by gestures and appropriate facial expressions the voice takes on a special form depending on the content of the message conveyed, such as cries of joy or alarm, the whispering of lovers, a command or a complaint, right down to the anonymous voice of the speaking clock and the voice synthesizer of a speaking computer. Saying "I love France" on a private trip into the country implies an almost confidential tone, because it can only have a private meaning. Uttered on a public platform in front of 10 000 people, during a rowdy electoral campaign, the same words call for an entirely different tone and intensity, for they change their meaning completely in the context of a declaration of patriotic faith.

The letterform is no different, in that it is never a motiveless act. In giving a visible presence to thought and words, prolonging them in time and space, the letterform fulfils a precise physical or spiritual function. According to the rôle assigned to it by society, the letterform becomes something different every time — whether in a liturgical text, a poster announcing a general call-up, a romantic poem, an insurance contract, private or public correspondence or even computer data. That is why, within any one culture and at any

moment in history, the specific function of the text and its content has largely determined its particular visual layout and word shape.

7 LETTER VISIBILITY

7.1 Punch-cutting

However, we must stress that regardless of function, and setting aside all considerations of style, the first objective of all language is to be clear and intelligible. The letterform must, first of all, meet the standards expected by our eyes and achieve acceptable standards of *visibility* before reaching that higher plane of *legibility* which gives perfect communion with the author's thinking, through the magic of written shapes, and transports the reader to a new spiritual and cultural plane.

Let us briefly review some of the general principles which prevailed when fonts were conceived and created during the golden age of French typography. Ever since the invention of typography, and thus for the last five hundred years, the craftsman, cutting his punches, imitated the manuscript scribes, whom he replaced, and engraved his letters one by one to accommodate the eye of the reader (for further discussion of punch-cutting see [5] and [6]). The punch-cutter worked within numerous constraints: physiological, technical and cultural. The first problem to be overcome in ensuring a good appearance of the letters was that of scale, because enlarging or reducing a letter modifies its image, if only because the altered inter-relationships of the letters also cause one's perception of it to be altered. Readers with weak eyesight soon become aware of the optical qualities of letters when they encounter small point sizes, poor-quality printing, bad light conditions etc.

To design a letter with an image that was as clear and as fluid and as intelligible as possible, he had to go beyond the idea of a letter and think of it as 'writing,' with its linear flow, its melody and its rhythm. He had certain elementary rules to guide him. For our Latin letterforms he had to differentiate between the letters as much as possible, by alternating wide and narrow letters, both round and square, in order to ensure easy identification and to build up *words*. In actual fact, we do not read individual letters but, rather, each picture-word with its own particular silhouette composed of ascenders and descenders. It also resembles a sort of 'X-ray' picture, formed of alternating dark and light areas, and each of these pictures becomes a unique ideograph in a dictionary of all possible words.

parole

Figure 7.

If the capital letters, arranged between two horizontal lines and with no marked silhouette, retain the static and monumental characteristics they originally had, making them unsuitable for composing long discursive texts, the lower-case letters, on the other hand, are animated forms of the roman capitals, gradually adapted to fulfil different functions by the movements of the scribe, and they follow the rhythm of speech, achieving their balance in the rightward trend of the movements which join them up within a word.

In the Latin tradition, the introductory and terminating strokes joining one letter to another recall the supple movements of the scribe, and help to form the shapes of the ideographs. To ensure the flow of the letterforms along the line, the punch-cutters of the golden age knew how to harmonize *thick* and *thin* strokes, in order not to break up the letters. They also knew that letters which were too heavy obstructed the flow of the letterforms, in the same way as letters which were too narrow and close together caused blurred vision and a dazzling effect. The punch-cutter, therefore, knew how to counter the optical illusions which could possibly disturb the apparent homogeneity of a letterform. He knew that, to the human eye, a horizontal stroke does not appear to be of the same thickness, or the same length, as the identical stroke in a vertical position; that, to our eyes, a circle is never a circle and a square never a square. He also knew that certain proximities can alter the relative position of parallels, or can cause angles to open or close; that too great a uniformity in the strokes, or in the height of the letters and in their alignment, makes them appear disorderly to us.The punch-cutter cheated as he worked out his engraving in order to get round all these phenomena of optical distortion, as well as taking into account the distortions due to inking, and the pressure of plate on paper, during the printing process.

consta

Figure 8. Small body size

Danses

Figure 9. Large body size

aoe
aoe
aoe

Figure 10. Large, medium and small body sizes

But above all he knew that the same rules did not apply to both small and large point sizes (see Figures 8–10). In a subtle way he had to adjust the design of his letters according to their respective dimensions. He therefore adjusted the width of certain narrow letters in a ratio inversely proportional to the point size. The smaller the point size, the more he opened up the counters (i.e. the internal areas of the letters) without, however, sinking into uniformity. He also adjusted the relative height of the face of the lower-case letters as compared to the capitals, and to the ascenders and descenders, in each point size. He used the same ratio, inversely proportional to the point size, when he made the whole alphabet heavier or lighter, reduced or increased the relationship between the thick and thin strokes, lengthened or shortened the serifs, opened or closed the internal angles and — absolutely vital — regulated the precise spacing between the letters, depending on

the point size and the rhythm of the letterform, since the spacing is an integral part of the design of each letter in each point size.

Apart from coping with these complex problems, which called for a good deal of practice and sensitivity, the punch-cutter knew how to respect the special features of the language in certain associations of letters, as well as how to give good definition to heavy type for both capitals and lower-case.

8 PHOTOTYPESETTING: POSITIVE FEATURES

However elementary these rules may have been for a punch-cutter or a font designer, they now seem to be part of a distant past, for the growth of phototypesetting has completely revolutionized the job of the typographic compositor. It is difficult to imagine performing the traditional craft of the punch-cutter today, given the economic climate in which phototypesetting is developing. Yet all too often we find that it is not so much for economic reasons that the possibilities of the new technology are not fully exploited, as out of ignorance of the cultural and technical problems posed by typographic design; consequently, phototypesetting and electronic digital typesetting, which really could be the very best, and something generations of typographers have dreamed of, has sometimes brought us to an acceptance of the very worst.

Figure 11. Kerning effected during phototypesetting from a Lumitype disk

Figure 12. Univers in the lumitype system. Note the sharp outline

In fact, if we look at the balance-sheet we can see that phototypesetting (with offset printing) has freed us from the distortions and filling-in of letters due to the pressure on the paper and the inking of letterpress printing, which the punch-cutter had to be careful to allow for in his work. In addition, we have been freed from the limitations placed on kerned letters by slug casting (Figure 11). Indeed, *achieving photographic sharpness* of the image of the letters is the main contribution of the second-generation electro-optical phototypesetting machines (Figure 12). This is now accepted and serves as a reference point for the future. But we must not allow ourselves to become obsessed with problems of digitization for cathode-ray tube or laser technology. Such problems are irrelevant, for

Figure 13. Garamond letter 'g' in metal type. Note the distortions caused by the inking process and by worn type

the distortion of font designs due to digitization is negligible compared to that experienced in letterpress printing (Figure 13). The high-fidelity reproduction available to us today allows us to spot, at the design stage, all the imperfections which used to appear for all to see.

CRT phototypesetting has also given us greater flexibility in arranging the spaces between characters, as well as a continuous and progressive gradation of point sizes, by comparison with the mechanical methods of typesetting in metal. Another advantage to consider is the *permanence of the image of the letters* which never wear out, however much they are used. That is the best feature of all, because mechanical type wears out, as do the metal matrices of mechanical composing machines.

Other considerable advantages one might mention are the relative ease with which matrices of a letterform can be created, stored and handled, compared with metal, as well as the fantastic speed of typesetting and marking up of pages of text. All the above should easily suffice to make us enthusiastic about every new generation of photo-typesetter machine.

9 SOME NEGATIVE ASPECTS

The other side of the coin is much less bright. Oddly enough, it is never the inadequacy of the technology which is to blame but, on the contrary, the degrading of typography is caused by the fact that a new technique often does much more than is asked of it, without necessarily bringing any improvement in quality.

Sometimes it does too little, sometimes too much, but often the imbalance is because of ignorance. Certainly it is much more distressing to see professionals furthering their own ends, knowing full well what they are doing but without admitting it. That is why, right at the beginning (and this can never be stated too many times) the promoters of this marvellous technology felt justified in introducing the practice of using *one single font design* for all the point sizes. Fonts set up or copied for use in an average point size, say 10 or 12, without the slightest modification for the new technology, have for the most part proved to be too light when printed by offset lithography (with its absence of ink spread) and the overall lightness is accentuated even more in the small point sizes of fonts with very fine hairlines (Figure 14). That is why the *Didots*, whose thinnest hairlines are clearly visible in all the point sizes, have completely disappeared from the catalogues of the phototypesetters (Figure 15). (In fact, the thinnest hairlines in 12 point disappear completely in 6 point, and when the letters are broken in the middle the letter-forms assume a rather threadbare appearance on the page.)

Figure 14. Garamond and Galfra at the same nominal point size

Mon principal but est toujours de
plaire : pour en venir là je considere
le goût du siecle. Or après plusieurs
expériences il m'a semblé que ce goût
se porte au galant et à la plaisanterie :

Figure 15.

Numerous attempts have been made to compensate for this failure to adapt letterforms to the new technology. But, as it stands at present, none of the solutions of 'systematic adjustment' so far suggested has given satisfactory results. Hence, to obtain legible fonts in the very small point sizes used for small ads, in newspapers or in telephone directories (see Figures 16 and 17) (and such fonts are not generally to be found in the catalogues), it has been necessary to design them specially [7], taking into account the problems of both perception and manufacturing, just as the punch-cutters used to do. Other proposed solutions have included:

● *slavishly copying a chosen point size of a metal typeface*, bringing all the inherent constraints of a different technology into this new field (rarely attempted today).

● frequent use of *duplexing* (in the manner of slug-casting machines) doubling up roman and italic letters, affecting readability and taking away the proper complementary roles of the two fonts (see Figures 18 and 19).

● *'systematic' modification* of the spacing of an alphabet, on the understanding that certain letters at the limit of their spacing must not be modified.

● *automatic justification* by modifying the spacing of the letters, and occasionally their width, thus altering their form from one line to the next, forcing the reader to accommodate each line at an ever-changing rhythm, an exhausting exercise in eye-gymnastics (Figure 20).

● as many *kerned letters* as you like, a practice carried out for the most part by operators untrained in this tricky exercise, often with deplorable results, destroying the delicate balance so carefully created by the alphabet designer (Figure 21).

Unlike CRT systems, where the designer could still intervene to correct digitization errors made by the machine, laser systems allow no intervention in the digitization, because the breakdown of signals into dots is done by the computer alone in an unpredictable and irrevocable way.

Figure 16. Galfra at 5 point

Figure 17. Clottes at 3.5 point

Figure 18. Complementary roman and italic Garamond

Tanip

(a) Normal Roman type

(b) Use of duplexing to produce roman and pseudo-italic (by slanting) from a common design

Figure 19.

Et nous arrivons au point culminant
des possibilités des photocomposeuses
aujourd'hui qui, hélas, entre des mains
> inexpertes, peuvent produire la destruction de <
la meilleure écriture typographique.
Comme nous pouvons voir, ce n'est pas
> la technique qui est en cause, <
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Figure 20. Justification by systematic modification of letter spacing (above) and by typographic distortion (below)

AVALANCHE

Figure 21. Software kerning can disrupt typographic balance

And finally we see the crowning feature of the possibilities offered by digital typesetting today, which, alas, in unskilled hands, can lead to the destruction of all the best typographic letterforms, namely, the excessive freedom given to the unqualified user. This includes the freedom to *manipulate* and *deform* a basic alphabet design, the work of one designer or a part of our artistic heritage, by electronically making the letters light, heavy, wide, condensed, forward-leaning to give so-called 'italics' (Figure 22), or backward-leaning, a bit more or a bit less, all by following the maker's instructions. And yet it is all too obvious that in robbing the typographic designer of his work these methods can never improve it, but can only destroy. The contrast between a true italic and slanted roman is shown in Figure 23.

Et nous arrivons au *point culminant* <
des possibilités des *photocomposeuses* <
aujourd'hui qui, hélas, entre des mains
> inexpertes, peuvent produire la des-

Figure 22. Digital typesetting makes typographic distortions easy to achieve

Cette ligne est en baskerville italique

Cette ligne est en baskerville romain penché

Figure 23. The contrast between true and pseudo-italic

By contrast, one of the features of the *Messidor* font, which was designed with the new technology in mind, is that it exploits the possibilities offered for distortion; starting from a basic roman design it gives a complementary inclined character, but with a different rhythm and colour [8].

Messidor characters were created using new computer-based methods and they exploit the possibility of the distortions offered by this new technology. Starting from a design for the roman characters a complementary slanted character, different in rhythm and colour, is created (see Figure 24).

We could say that the manufacturers should not be held responsible for the wrongful

Lᴀ chair est triste, hélas ! et j'ai lu tous les livres.
Je veux aller là-bas où les oiseaux sont ivres
D'errer entre la vague inconnue et les cieux !
Rien, ni les vieux jardins reflétés par les yeux
Ne retiendra ce cœur qui dans la mer se trempe

Figure 24. Roman and slanted complementary characters in Messidor created from a common design

use of their machines. And yet, selling machine guns and kneeling down in the evening to pray that the Holy Virgin Mary will make sure that the customer does not use them, seems to me to be neither very moral nor very effective. Alas, certain companies, not necessarily the minor ones, are not just content with handing over their alphabets for future massacre, but they themselves produce handbooks suggesting tried and tested methods of destruction.

As we can see, it is not the technique which is to blame, but the abuse and exploitation, from manufacturer to customer, purely to maximize profits, with the more-or-less-willing help of the technicians. It would seem that in this respect we have reached the point of no return since, in this present crisis, it would be difficult to envisage banning anti-typographic practices in the use of these technologies, given that the printers are guilty of abuse just as much as the manufacturers. That would be tilting at windmills.

10 LEGIBILITY AND CULTURE

All that has been said so far is really only a discussion of the basic problems of typography, i.e. the effective physiological perception of 'book' letterforms. The other half of the problem, no less important than the first, is the cultural aspect of typographic letterforms. We often see that the clearest and most visible font does not necessarily stimulate the desire to read, and may be rejected by the reader as totally illegible. *Legibility* is more complicated than that. After meeting all the criteria of good physiological perception, the font must meet the reader's own cultural needs, psychology and traditions. Thus it was that the Gothic letterform, perfectly legible for Germans before the war, was absolutely illegible for the French who found it aggressive. The same goes for the lower-case sans serifs, a German invention that even today, after fifty years' existence, has still not managed to achieve acceptance for literary publications in Romance languages.

The fact is that our letterforms are not just phonic symbols. The expressive and emotive content of every stroke of our letterforms, be they in typography or in handwriting, makes a language which is superimposed on the functional meaning of the text, and both aspects are perceived simultaneously by the reader. This has nothing to do with aesthetics, for beauty is not absolute. According to Plato, beauty is something which pleases our senses and our mind, which leads on to the whole question of cultural subjectivity. However, our relationship with shapes, which we still have not succeeded in unravelling completely, makes us declare that, for some people but not for others, a certain thing may be beautiful and some other thing ugly; such beauty, fragile and relative though it may be, is

a function underlying all perception of the visible world and of letterforms in particular.

In a typographic script, which is an extension of the movements of the writer, readers are happy to discover a memory of their bodies. The specific nature of a cultural identity is expressed, first of all, in the privileged means of communicating thought that we call oral language and, at a higher level, in the constant, precise and sensitive form of graphic expression that we call 'writing'. Throughout history conquerors knew what they were doing when, each time they wished to subdue a nation and redirect the thinking and behaviour of the people, they began by stripping them of the major characteristics of a national identity, imposing a foreign language and a foreign letterform. That is why, conversely, each time a people wishes to regain its liberty, the very first demand is the use of its own language and writing, the expression of its own identity and a measure of its liberty. The perception of readers goes beyond the meaning of the words to pick up echoes of the image of their own cultural identity, which they accept, or if they perceive only hostile and foreign forms, which they reject without further consideration. For texts closely identified with a certain language, a letterform which reflects the cultural identity of the reader is often a major factor in good legibility.

11 INFORMATIONAL TEXTS

This need to convey a certain identity is certainly not so true for letterforms used in descriptive documentation and publicity material, for all kinds of management and administrative purposes. Here the aim is more functional and universal, using forms more or less devoid of the extra elements which express cultural characteristics. It cannot be denied that most of the numerical and scientific symbols (together with descriptive ideographs and other abstract symbols) which are used today more than at any other time in history, match so precisely the universal ideas and concepts of the modern world that we do not even try to translate them into the different languages existing alongside them. However, although the schematic letterforms often found in computer output and information transmission are more or less tolerated in their restricted functions, their use becomes intolerable in letterforms for book publishing and all texts closely identified with the spoken language. Curiously enough, in the beginning, typography allowed us to affirm a certain cultural identity by encouraging writing in vernacular languages, as well as consolidating these languages by drawing up the rules of grammar and orthography; and this same typography, which for centuries was the guardian of the language and culture, is today eliminating accents on capitals, and often on lower-case letters, and thus shamelessly mutilating the French language. Curiously, and again regrettably, we see little sign of protest over the scandalous and intolerable disappearance of these accents in the majority of catalogues coming from the English-speaking countries, where there is an additional systematic enlarging of the x-height of the font, contrary to French tradition and the requirements of the language. Let us not forget that among the characteristics of French typographic letterforms, apart from the symbiosis of a certain rigour and humanism, resulting from the dual nature of their origins, we find fairly large capitals marking the beginning of relatively short, logical phrases, which is the nature of the language (Figure 25). On the other hand, in German typography the page is punctuated by frequent capital letters in never-ending sentences, which in roman letterforms calls for a reduction in height and boldness of the capitals, almost down to lower-case size, in order to blend them into the text (Figure 26).

¶   Quis credidit Auditui noſtro: &
uelatum eſt, Et aſcendit ſicut virgultum
radix de terra deſerti: Non erat forma ei,

Figure 25. The Latin tradition: large capital letters

Es wird sich erweisen, daß die Schrift allen
Kopiertechniken und Druckverfahren gere

»Edison«   Hermann Zapf,

Figure 26. German text: an abundance of capitals calls for a size reduction

The letterforms of each language, apart from their characteristic shapes conveying a particular culture, have their own requirements. It would therefore be entirely unacceptable to set a French text and a German one in the same font — not to mention English, in which accents are unknown and which readily accepts an extension of the relative height of the lower-case letters. The profit motives of the phototypesetting industry naturally give first priority to a typography with a tendency towards universal use, stripped of all specific cultural identity, aimed at a limitless market. A flagrant example of this trend towards uniformity of letterforms is seen in the way each letter of any particular style is altered to conform to a statistically average width. That is how the fonts which are French or in the French tradition have totally disappeared from the phototypesetters' catalogues. No more *Garamond* (Claude) but fifty or more bastardized versions, owing to Garamond only the fraudulent use of the name; no more *Granjon*, *Jannon*, *Grandjean Luce*, *Fournier*, and even less of *Didot*, *Beaudoire*, *Perrin*, *Grasset* and *Auriol* [9], [10].

We have to realize, however, that the disappearance of French fonts from the catalogues cannot be solely attributed to phototypesetting. The process began a hundred years ago at the end of the nineteenth century, when *Monotype* and *Linotype* shared out between them the universal market for book and newspaper typography; and the French type foundries were reduced to producing nothing but fonts for titles, publicity and entertainment. We have to realize that the degradation of French typography began here, when it was no longer sustained by an adequate industrial infrastructure. Phototypesetting simply emphasized this degradation. With the disappearance of traditional French typography, a little of our own cultural identity is gone forever.

12   TYPOGRAPHIC BILINGUALISM

There is no question whatsoever of rejecting letterforms with a tendency towards universal use, such as sans serif and other letterforms with characteristics foreign to our culture, in favour of book letterforms from the French cultural heritage. Although they are not interchangeable, each has perfectly worthy and specific functions and they must be seen as complementing each other

Insofar as a certain sort of English is a universal language, such as Latin used to be and Esperanto hoped to be, we can ask that its letterforms for communication should not

supplant other vernacular and cultural letterforms, but should be seen as an additional facility. Bilingualism is indispensable if people are to communicate within and beyond cultural and linguistic frontiers. In no way does this exclude the exchange of ideas and influencing one another. There is a very delicate balance, however, since even the most functional things are seen through the cultural 'filters' of the individual. We accept or reject forms perceived as hostile because we do not recognize ourselves within them.

A letterform, even one which is, apparently, a purely functional one, possesses a cultural dimension which some would call 'aesthetic' and which, when identified with a language, is a real function underlying all the others. Writing "women" in French, Arabic and Chinese conveys totally different and untranslatable ideas, because the written shapes express differences of culture and ways of thinking which are inseparable from the language. To a lesser degree we find the same with Swedish and Portuguese letterforms too.

When the post arrives in the morning, we only have to glance at the envelope, the letterform and the way it is addressed, to know whether the letter comes from England, Germany, the United States, or Portugal. Differences in education and culture, hence differences in social behaviour, are imprinted, one might say, in the letterform on a plain envelope. Thanks to the physical and psychological input in the lives of the letterforms, the writer plainly reveals the indelible marks of his or her personality and socio-cultural standing.

On a different level, typographic letterforms, insofar as a society recognizes itself within them and makes them part of itself, become the expression of a certain identity, in the same way as the spoken language does. There is a French dimension to letterforms which will never disappear as long as we think and speak French. A culture is never static, of course — it continually recreates itself. Borrowings and exchanges are the main sources of enrichment of the human mind. But that presupposes that we have something to exchange; a certain reciprocity or an equality between partners is indispensable.

This is why it seems so important to me to keep a watchful eye on and develop our own specific identity — *the the French cultural dimension* — wherever it is different and authentic.

13   WHERE ARE WE NOW: WHAT OF THE FUTURE?

To sum up then, phototypesetting and computerized digital typesetting, as they function at present, despite all their infinite technological potential, do not solve any of the problems of typographic quality, since they respect neither the elementary rules of good perception of letterforms nor their specific cultural origins. As it takes over the creations of the typographic designers, the phototypesetting industry provides often unscrupulous users with weapons which are completely out of control and which represent a danger to typography.

The degrading of the typographic culture that this has brought about is not just a matter of concern for France. This is a worldwide crisis, and a part of the general crisis of our civilization, where traditional values are being challenged. Fortunately, in some parts of the world there are still a few publishers, not necessarily the big ones, who are conscious of the quality of their publications and try to resist the temptations of the easy way. But they have extremely limited room for manoeuvre. It is lucky, perhaps, that desktop

laser printers are now on the scene, with their 300 or 400 lines per inch, hard on the heels of the manufacturers of second-generation phototypesetters, and causing panic among them, to the extent that they are expending considerable effort on showing the 'difference' in quality.

The problem of 'high resolution', which is apparently the dividing line between the two techniques, has become a positive obsession which is concealing the true weaknesses of present-day phototypesetting, the quality of the letterforms and the way they are used.

Typographic production today is slipping out of the hands of those typographers who are conscious of quality, into those of the English-speaking manufacturers who are imposing on everyone a 'locked-in' technological back-up, a veritable Pandora's box which no one can enter,[1] containing a typography which does not take sufficient account of either the letterform or the reader. The road to freedom as far as typographic quality is concerned must lie in recapturing the instruments of design, in every country. It is curious to see how 'Anglicisms' in the popular language have drawn opposition from literate people, anxious to defend certain values inherent in our language, and yet the universalized foreign letterforms which convey French thought today pass without the slightest protest. This is where we truly measure the degrading of a certain sensitivity to written and typographic shapes, as much in the average and cultured readers as in the authors themselves.

It is not a matter of indifference whether a literary text finds its material and visible representation in written shapes which offer it worthy support and faithfully bring it to life. That ought to be the very first priority of the authors. At universities in the Middle Ages they used to teach letterforms in order that a text could be well presented to the readers. Alas, that is no longer the case today. Nevertheless, the fact that we are talking about it today is one of several indications that there is a certain willingness to rehabilitate typography and the book. Important steps have been taken in this direction in the last few years, in France especially, but quite clearly the time has not yet come for a general re-awakening, capable of reversing the current trend.

To end on an optimistic tone, let us note that, in order to keep the spirit alive and try to rehabilitate French typography, we have established a National Workshop of Typographic Design funded by the Ministry of Culture, at the Imprimerie Nationale, where we are handing over the baton by taking on a few talented young trainees in font design.[2] History has its unpredictable turning-points, and just at this moment things are moving very fast.

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[1] Since this was written, improved techniques allow each individual to create and realize his own alphabet without any technical knowledge.

[2] Today, this 'Atelier' has lost its original vocation and has become an annex of the E.N.S.A.D. (Ecole Nationale Supèrieure des Arts Decoratifs).

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