LITTERA SCRIPTA MANET

VISIBLE LANGUAGE

The Journal for Research on the Visual Media of Language Expression

Volume V, Number 1, Winter 1971

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COVER ILLUSTRATION

Warren Chappell lettered this quotation from Horace, "The written word remains," as the frontispiece for his new book, *A Short History of the Printed Word* (New York: Knopf, A New York Times Book, 1970).

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VISIBLE LANGUAGE

The Journal for Research on the Visual Media of Language Expression

Why would a magazine with a great name like *The Journal of Typographic Research* decide to change it? For one thing, having to add a footnote every time the name is mentioned in order to explain its actual range of interests finally got to us. As a subscriber you will have to admit that no matter how broadly we attempt to define "typographic research," it no longer adequately describes the research efforts in the field or the major concerns of this Journal. "Typographic research" has become a label that has to be stretched; "visible language" is a concept that remains to be fulfilled.

At this stage we hesitate to allow ourselves getting backed into a strict definition of visible language. As the subtitle indicates, we are suggesting that it encompass the investigation of any expression of a language in visual form—writing, typography, signing, *et al.* Based on the four years of our publication, we will go as far as to attempt a general overview (overleaf), to indicate the range of our interests rather than to compile a comprehensive list of constituent parts. The chart suggests one way of looking at a simple interaction: on the left, a vast array of talent and ideas concerned with devising the visible language characters and arranging the configurations which end up displayed on a surface; on the right, our complex, interrelated physical and mental faculties which receive and process these visible language images. Obviously, there are important relationships that have not been expressed and categories that overlap or defy easy classification; your criticism is solicited (make a photo copy of the page and add your own comments). You might also take a look at the list of major articles which have appeared in the Journal (pages 93–96) as a further indication of the range of interests we are identifying as visible language research.

Given this provisional outline, the Journal's primary purpose might

VISIBLE LANGUAGE

Conception & Formation ——→ | ←—— *Reception & Interpretation*

Generation of symbols	*Application & Organization*	*Physical Response*	*Mental Response*
Relation to language generation	Language medium and language structure	Neurophysiological (e.g., vocalism in reading)	Meaning/ form dichotomy
Origin & evolution of the alphabet	Comparative writing systems (e.g., phonetic/ non-phonetic)	Reading/hearing relationships	*Meaning*— language organization and comprehension
Post-typographic electronic generation	Writing/speech relationships; phonetism of the alphabet	Alphabetic efficiency; eye movements; fatigue; search	*Form*— non-verbal communication of letterforms
Alphabetic prototypes	Typographic & electronic letterform display	Legibility & perception	Visible/oral language dichotomy; "primacy of speech"?
Script and type design—hand or machine	Environmental "signing"	Initial visual discrimination training	Visual encoding of verbal materials
Influence of tools	Paleography	Machine reading	Conscious & unconscious
Augmented alphabets (e.g., ita); shorthands; "universal" scripts	Descriptive bibliography		Literacy
Electronic representation of speech	Practice of the arts: calligraphy, concrete poetry, letterforms in plastic media (e.g., Paul Klee)		
Graphology	Comparative sight/sound media (e.g., musical notation)		

VISIBLE LANGUAGE FORMS ON A SURFACE

be stated as supplying the impetus to bring together this scattered research effort (1) by helping to identify the various research efforts and (2) by improving the exchange of information among the individuals currently engaged in research on visible language problems —within the humanities, the sciences, and the visual arts; between research and practice. Out of a growing awareness and acceptance of a general visible language concept and as a result of increased participation by a wide range of investigators, a fairly precise definition should gradually emerge. The problems of organizing visible language research were discussed in a previous report by the editor;[1] a few related points from this discussion are pertinent here.

While investigation is flourishing in a variety of fields, visible language research remains an academic orphan. The dispersion of the many subject fields concerned with visible language tends to isolate research efforts and to preserve boundaries between what should be interrelated specialties. The direction and progress of research remains completely dependent on other disciplines; choice of research problems is left to chance interest by individuals whose major concern is oriented elsewhere. Our psychology journals, for example, report a hundred or more experimental studies a year in which elements of visible language play an integral part, but the implications for visible language research go unrecorded. Research multiplies on obsolete and overworked problems on the discipline level, while sophisticated, theoretical problems which would develop naturally out of a cooperative inter-disciplinary attack remain unidentified. And because there has been no focal point, applied research areas—e.g., literacy, highway safety, textbook typography—have difficulty finding information and guidance. Nowhere is the "horseless carriage" effect more apparent than in the slavish copying of eighteenth- and nineteenth-century typography by electronic publishing.

Four years of proselyting have demonstrated to us that there *is* a natural connection between the now disparate visible language research programs, and that there is promise of mutual benefit to the individual programs involved in pursuit of that connection. The roots of our present disunity lie in a failure to recognize that the essence of this natural connection lies in the fact that we are all dealing with visible LANGUAGE.

This has been our rationale for publishing an increasing number of articles dealing with various related aspects of linguistics. In this issue linguist John Lotz (pp. 75–81) contends that "script" must be "treated in its own terms" and proceeds to suggest its proper relationship to speech and to the total framework of language. In previous issues and elsewhere John Mountford has perhaps made the most thorough attempt to sort out definitions and relationships of the linguistic media of expression. Here, for example, is an excerpt from his encyclopedia definition of writing:[2]

Part of our linguistic communication is by graphic means, and part of our communication by graphic means is linguistic: this intersection is the domain of writing. Within this domain, from the point of view of linguistics, the centre is occupied by natural written language; that is, by writing (however produced, whether by hand or mechanically) involving a particular natural language (English, French, Japanese, etc.) and its institutionalized writing-system. . . .

Modern linguistics established itself as a science with the investigation of the phonological and phonetic structure of speech. Reaction against the preoccupation of philology with written texts and the popular identification of language with writing . . . led some linguists to elevate into linguistic theory the popular notion that writing is the record/representation, "mirror" of speech, historically derivative, and in some way a substitute for the real thing. . . .

The development of linguistic theory has proceeded as much in association with written language, in the philological tradition, as with spoken, not because the two are identical in all respects, but because both are language, with the same fundamental communicative function, semantic content, grammatical structure, and realization relation; it is only the realizations that are in distinct media—the substances of "air" and "ink," to use Uldall's apt terms. The two media are physically quite different; but each is linguistically patterned substance, and because of this the patterns of "ink" call for investigation of their own right no less than those of "air," as many linguists have seen. Unfortunately the investigation of the graphological and graphetic structure of writing has lagged behind the corresponding investigation of speech. . . .

On the view adopted here, the relations between sound and symbol which dominate many accounts of writing, take a secondary place. This is not to deny their very great importance in many descriptive and practical respects; but it is to deny that the primary function of writing-systems is to give phonological information.

The necessity of extended comment by both Lotz and Mountford on what should be the proper relationship of script/writing to speech and language is indicative of how deeply instilled within linguistic thought today is the idea that script/writing is only speech written down. In this respect, both Lotz and Mountford are linguistic mavericks; we couldn't agree more with their analyses. In fact (at the risk of over-extending Mountford's statement of a simple relationship), what he proposes lends itself to further examination. We have devised the following diagram to represent his initial statement: "Part of our linguistic communication is by graphic means, and part of our communication by graphic means is linguistic; this intersection is the domain of writing."

Mountford proceeds from this (as we have seen) to maintain that the proper study of linguistics includes adequate attention to both media of language expression: to the left third of the diagram— which we assume to be speech—and to the center third, writing. The right third—non-writing graphic communication—is a little more indefinite. Its relationship to language and to writing is an important part of the concept being developed by The Conference on Visual Literacy. In an address to the first Conference (published in this Journal[3]) Colin Murray Turbayne makes the point: "The visible world is a script, presented in alphabetical form, which we have to learn to read. . . . Seeing is modelled upon reading; painting, sculpture, and photography are modelled on writing—and are forms of writing in visual language."

Mountford is addressing his peers in language research—as Lotz does also—and in linguistic terminology. In an article in this Journal

several years ago Mountford addressed the "typographic" audience on a related theme:

> What must be remembered with regard to writing is that the notion of language is built into it. This must not be lost sight of anywhere along the line, the line which goes from the literate mind, through the production of writing, the reproduction of writing, and the reception of writing, to the literate mind again. It must not be lost sight of whether writing is being considered per se, or in comparison with other means of communication, linguistic or non-linguistic.[4]

It should be pointed out that the center segment of our diagram has been shaded-in not just by chance; it symbolizes the glass through which both the graphic communicators and the linguistic communicators see darkly! However, in the quotation just above Mountford looks across it, and in addressing the graphic communicators—or "visualists"—is urging them to breach the barrier. In suggesting earlier that our natural underlying connection is visible *language*, we have already agreed with this admonition to the visualists; and, Lord knows, we have been spreading the gospel with increasing evangelistic fervor during the past two years—to the discomfort of some of our subscribers.

Perhaps this is as good a place as any to consider briefly the complementary question that our name change and our shift in editorial emphasis has raised: Is the Journal abandoning typography? This would make about as much sense as a journal of research on the visual arts abandoning easel painting. (As a matter of fact, easel painting and typography have much in common: their beginnings are intertwined, as McLuhan points out, and the survival of both is being threatened by more revolutionary media.) Typography remains the primary visible language medium, and a scholarly journal should reflect contemporary research interests, not attempt to manipulate them. Much as we disagree with the limited concept of a great deal of legibility research, its primary purpose and the fundamental aim of historic "invisible typography" (so legible you look through it, not at it) is to make a print perfectly functional *language* medium. Equally conscious of this role is the contemporary designer of complicated textbooks and catalogues who rightly assumes that the best typographic design is 90 per cent organization. In these respects, typography also has traditionally attempted to breach the barrier.

Let's carry this point a bit further. We have heard from the linguists—and more or less agreed with them—but turn-about is fair play:

> ATTENTION LINGUISTS!
> What must be remembered with regard to writing is that the notion of VISION is built into it. This must not be lost sight of anywhere along the line, the line which goes from literate mind [*visual* mind? we're on unsteady ground here!], through the production of writing, the reproduction of writing, and the reception of writing, to the literate mind again. It must not be lost sight of whether writing is being considered per se, or in comparison with other means of communication, *graphic* or *non-graphic*.

Marjorie Crofts gets to the heart of the matter but has not indicated in her article (pp. 49–58) whether the actual design of the alphabetic characters for her new Mundurukú Indian script caused her any great concern. We suspect that the professional alphabet designer might question whether diacritical marks are the answer to the symbols for a new visible language. He might well ask whether the notion of vision has been built into the new alphabet—or even considered. The letter/type designer has been responsible for making many (perhaps all) of the decisions which have determined what our letterforms look like today. As with the initial invention of the alphabet (David Diringer insists that it was an invention), somewhere along the line the creative hand of a letter designer made the critical decision forming the letter j. Who knows, at this very minute perhaps a contemporary letter designer is creating the new form of our letter D, which Rudi Bass points out (pp. 33–48) is very awkward to adapt to electronic letter formation. If our letter D changes, the new forms may eventually affect the way it also operates in the oral medium of language. As it has in the past, the visual medium may very well affect the transition of language form, not follow as a secondary reflection.

One final point: the limited concept that both Lotz' "script" and Mountford's "writing" extend to the character of visible language continues to distress us. For the linguist, it would appear, visible language is characterized as an unending stream of, say, 11-point Baskerville type, leaded 2 points (which is the page you are reading) designed explicitly for maximum legibility—no, designed for maximum transition of verbal language. This would be comparable to

the visualist restricting his characterization of the oral medium of language as an unending stream of a university president's commencement address—hardly typical of the tribal world-communication medium lauded by Carpenter and McLuhan. The McLuhanites (Ongians?) do their own invaluable insights a disservice when they thrust a full-blown description of the variety, the range, and the relationships of oral expression against a straw man: visible language in its most unsophisticated form. In *its* simplest form, speech is also a single-sensory, linear system of abstract language symbols.

Edmund Carpenter ends his article (pp. 67–74) with the appeal of print to society's "drop-outs," "The hippies have discovered print, something totally new to them." But the glass is still dark. Carpenter is referring here to written literature, but in using "print" in this context he calls up all the Carpenter/McLuhan connotations surrounding that word. The hippies' discovery of print wasn't a "delightful reversal" of what one would predict; it was inevitable! What revolutionary movement within the memory of man hasn't utilized visible language expression? But in a curious lapse, the hippies' manipulation of the *medium* is ignored. Linguistic definitions of "script" and "writing" and "print" have difficulty in fitting in revolutionary communiques—or concrete poetry, or Picasso's discovery of print. When the hippies' cohorts in the French student uprising slashed the walls of Paris with their own interpretation of the visible language medium—what was the message?

Whenever social historians attempt to suggest the few most significant intellectual achievements of man, nearly always the one mentioned first is "writing"—or some related reference to man's initial development of a visible language. This Journal represents what could be the first concerted effort to organize our investigation of every respect of this visual medium of language expression.

Merald E. Wrolstad, Editor

1. "Letterform Research Needs Definition and Direction: A Report from the Editor," III (April 1969), 115–126.
2. "Writing" in A. R. Meetham (ed.), *Encyclopaedia of Linguistics, Information and Control* (Oxford: Pergamon, 1969).
3. "Visual Language from the Verbal Model," III (October 1969), 345–70.
4. " 'Writing' and 'Alphabet'," II (April 1968), 226.

Calligraphy—An Aid to Cartography?

A. S. Osley

Calligraphic analysis goes beyond general styles of writing and kinds of writing materials used; it attempts to isolate the characteristic features of a script and the scribe's personal performance. Specimens from various periods of Gerard Mercator's cartographic work are examined and compared, including a map recently discovered that, after calligraphic analysis, can be identified as almost certainly by Mercator. The importance of calligraphic analysis for determining cartographic attributions is discussed.

My experience in the world of cartography is that of an amateur. My justification for undertaking this paper is that in all branches of knowledge today the frontiers between the various disciplines are less closely guarded and patrolled than in the past and contributions from over the frontiers have no longer to be smuggled in, but are freely accepted by the authorities. There should be no balance of payments problem in the world of knowledge.

The question mark in my title is deliberate; I want merely to suggest certain ideas, not to be dogmatic. And I use the word "calligraphy" in a rather strict sense. The hand-written word can either be informal—as when we write letters, laundry lists, or notes of a telephone conversation; or it can be formal—as when a scribe writes an illuminated address, a designer lays-out a book-jacket, or an artist letters display notices for the goods in a department store window. The qualities of handwriting are speed and idiosyncrasy. It is usually easy to distinguish one man's informal hand from another. Indeed, it is often claimed that we can read character in handwriting. The mark of calligraphy, on the other hand, is that it is impersonal, deliberate, and in conformity with a model. It is also usually done on ruled lines and adjusted carefully to make an agreeable pattern on a page. Specimens of calligraphy of a particular age

may therefore appear to an untrained eye to "look all alike." But careful analysis by a trained eye can reveal significant differences.

The examples which I have chosen are taken mainly from the fifteenth and sixteenth centuries; partly because this is a period rich in examples of calligraphy; partly because there lived at this time the unique example of one who was not only a fine cartographer but a master calligrapher in his own right—I mean, of course, Gerard Mercator; and partly because I happen to be familiar with the styles used in those years.

Calligraphic analysis goes beyond the obvious features of the general style of writing and the kind of materials used, though these things in themselves can provide valuable evidence. It attempts to isolate the minute but characteristic features of a script (the way, for example, an *i* is dotted), or the scribe's difficulty—perhaps due to age or physical disability such as arthritis—in forming certain letters, or his partiality for a certain kind of ampersand or a particular type of punctuation. None of the individual features is necessarily conclusive—it is important to keep this in mind—but a number of them in combination may make an irresistible chain.

Perhaps I can illustrate my point most clearly by letting you see an expert at work. As you know, one of the most famous records in British history is the Domesday Book, a detailed register of the lands of England drawn up by order of King William the Conqueror between 1086–87. Superficially, the record appears to be in one handwriting. It is of interest to historians to know whether this is so. In 1952 a distinguished calligrapher, Mr. Alfred Fairbank, was asked to examine the book. Here is an extract, which he has permitted me to make from his unpublished report:

"The writing has the appearance of having been executed at some speed and it lacks the precision of some late Caroline hands. I hoped therefore to find signs of the personal failures (or idiosyncrasies) of the writer or writers due to the speed at which the script was written. I found such evidences and they seem obvious enough when indicated for any person to identify. They point to a conclusion that the whole book was written by one man.

"The two most significant failures, which appear throughout, are to my thinking expressions of personality and not characteristics of the script when written quickly:

(a) There is a tremble or wobble, occurring intermittently and not regularly, in the ascenders, though not similarly in the descenders.

(b) The writer lacks a good sense of scale and alignment. As regards scale, *o* and *i* are often much smaller than *n* and *m*. As regards alignment, a failure is often evident where *om* occurs in words, and a further feature is that the *m* in such instances tends to fall below the line progressively."

Mr. Fairbank was also able to prove, because he could himself write the style rapidly, that the Domesday Book could have been written in a year, a thing which some earlier historians had doubted.

The examples of late fifteenth-century calligraphy in Figures 1 and 2 can be used to demonstrate an elementary form of the analytic

Figure 1. Manuscript by Bartolommeo Sanvito (British Museum, MS. Harl, 2528).

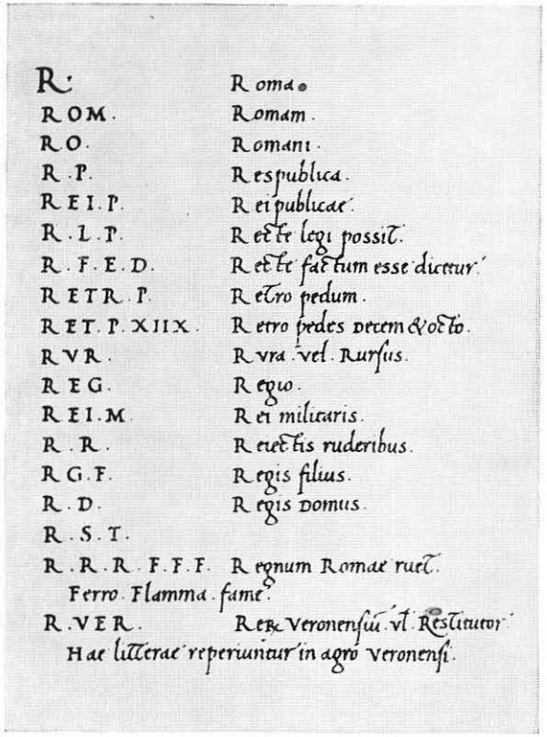
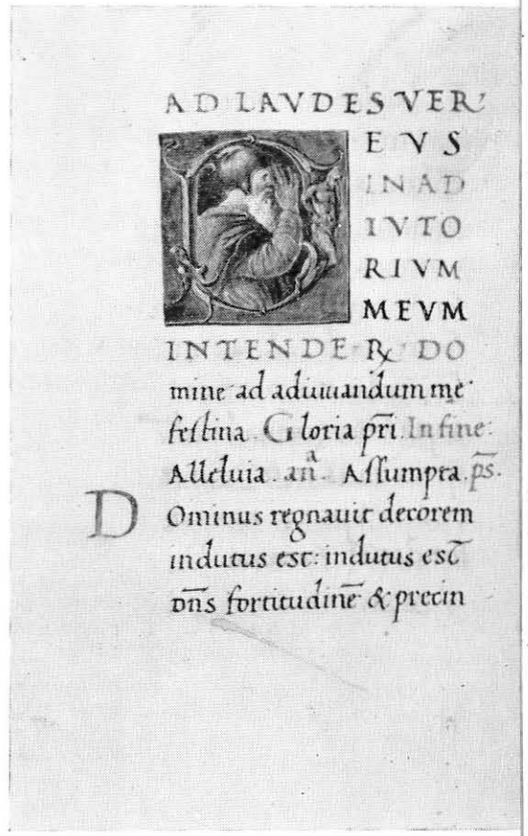
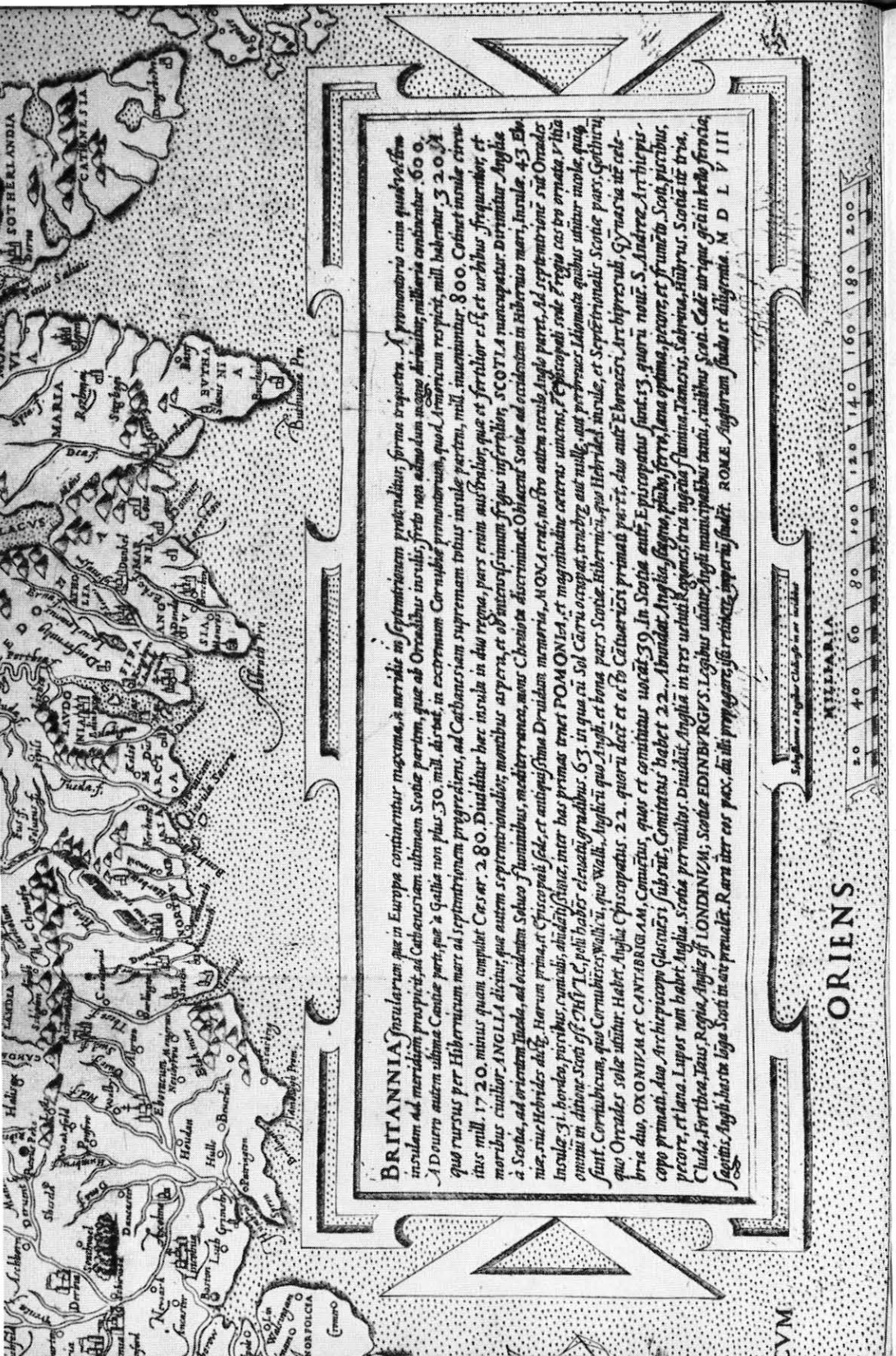


Figure 2. Manuscript by Bartolommeo Sanvito (British Museum, MS. Add. 20927).





process. In Figure 1 we notice two special features: the broken-backed *t*, in which the crossbar is placed at the top of the letter; and the contraction ℞. When we examine Figure 2, these features are repeated. There are other more minute similarities: notice, for example, the correspondence of the *g* and the ampersand. Our suspicion that the two manuscripts were written by the same hand proves to be correct. Both are by the scribe Bartolommeo Sanvito of Padua. The second example is written in a rather shaky, uncertain fashion. This permits us the further conjecture that the scribe may have written it in old age, although we should require other independent evidence before making an actual claim.

When we come to the early maps that are engraved and reproduced by the copperplate process, the problem grows more complicated. For the formal script of the map-designer often passes through the hands of an engraver, who may add something of his own style as he copies the manuscript model before him. As the art of engraving an elegant script took some years to develop, the addition was not neccessarily an improvement. Many of the engravers of the sixteenth century were humble artisans about whose lives nothing is known and whose activities might warrant further research. Some do, however, stand out; and their engraving on the whole probably improved the designer's original manuscript. Consider two examples by Sebastian de Re of Chioggia, whose work should be more widely valued than it is (Figs. 3 and 4). Another engraver of comparable quality is the Belgian who worked in Italy, Jacobus Bossius (Fig. 5).

To turn now to Mercator, who is a crucial figure in this story; he and his work will occupy the rest of my paper.

Gerardus Mercator was born early in the morning of Friday, March 5, 1512, at Rupelmonde in Flanders. His parents had recently moved there from the small village of Gangelt in Germany to stay with his uncle Gisbert. This uncle, who was a priest, superintended the boy's education. He sent him to school at 's Hertogenbosch (Bois-le-Duc), the same school that Erasmus had attended nearly fifty years before. At the age of 18 he was entered in the University

Figure 3. Cartouche engraved by Sebastian de Re of Chioggia (from a Lafreri map of Britain, 1558).

Figure 4. Cartouche engraved by Sebastian de Re of Chioggia (from Salamanca's map of Greece, in a Lafreri atlas).

of Louvain. The university was the intellectual center of humanism in the Low Countries at that period. Mercator studied the humanities and philosophy. He took his Master's degree, probably in the autumn of 1532. About this time, he—like many students both before and after him—developed religious doubts; he found that he could not reconcile the biblical account of the origin of the universe with that of Aristotle and other authorities. He began to reflect on the beginnings of life and the birth of civilization—themes that were to occupy his thoughts for the rest of his life. His mind was clearly taking a scientific bent.

Louvain University was, however, not a comfortable place for this kind of independent speculation; even to question Aristotle could kindle suspicions of heresy. Between 1532 and 1534 Mercator used to go off by himself to Antwerp, and perhaps to Mechlin, and these visits aroused some comment from people at Louvain. But Mercator overcame his doubts and emerged with strong Christian convictions, which remained with him.

Mercator was in no position to devote himself wholly to elevated philosophic contemplation. He was a poor man who had yet to make his way in life. From 1532 to 1536 he drove himself on with relentless concentration, often going without food and sleep. He recalled, nearly fifty years later, how he attended the lectures of Gemma Frisius, but found that, through his ignorance of geometry, he was wasting his time. With Gemma's guidance and private tuition, however, he quickly mastered the subject. He went on to acquire a thorough command of astronomy as well as geography. More remarkable still, perhaps, he became a superb engraver, an outstanding calligrapher, and one of the leading scientific instrument makers of his time—all this by the age of 24.

In 1534 Mercator married Barbara Schellekens; and in due course they had six children. He worked with Gaspar a Myrica on

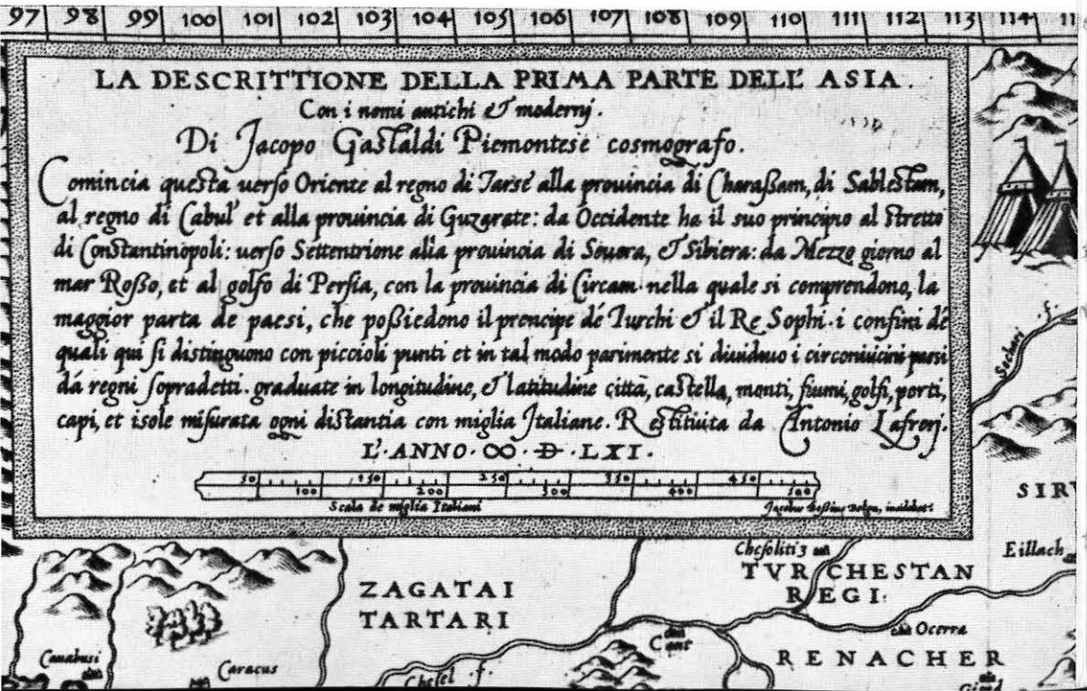


Figure 5. Cartouche engraved by Jacobus Bossius Belga (on a map of Castaldi of 1561 in a Lafreri atlas).

Gemma Frisius's second terrestrial globe (1535–36) and on its counterpart, the celestial globe of 1537. Having earned great fame as an instrument maker, Mercator now laid the foundations of his reputation as the foremost geographer of the century. His first map is of Palestine (1537); then came the heartshaped map of the world (1538); the map of Flanders (about 1540); his terrestrial globe of 1541; and his celestial globe of 1551. His little treatise on italic script, *Literarum latinarum . . . scribendarum ratio*, was published at Louvain in 1540.

Suddenly, in 1544, he was arrested while travelling in the province of Waas, brought to Rupelmonde and imprisoned on a charge of heresy. He was one of 43 inhabitants of Louvain to be involved in this affair. His absences from Louvain on surveys for his maps were held against him. The matter was brought before the Governor of the Netherlands, Mary of Hungary. But the authorities at Louvain backed Mercator so firmly that he was cleared and released after about seven months. Five of the accused were executed.

Mercator resumed his former way of life. At some point in 1552, he decided to quit Louvain and to take up permanent residence at Duisburg, then in the Duchy of Cleve. One attraction was that in Germany he would find a more tolerant attitude to religious questions. Another, perhaps even stronger, was an appointment as court "Cosmographer" to Duke Wilhelm of Cleve and the possibility of becoming professor in the new university that the Duke was planning to found at Duisburg.

Mercator seems to have adapted himself without difficulty to his new life. He began a long and intimate friendship with his neighbor Walter Ghim, who composed a Latin *Life of Mercator*. From his home in Duisburg, he kept up an extensive and regular correspondence with scholars and scientists all over the world. In 1554 he completed the map of Europe which he had started at Louvain. In 1564 he produced a map of the Duchy of Lorraine and one of the British Isles. During these years he developed his famous solution for representing the earth's sphere on a plane surface ("Mercator's Projection"). This enabled a mariner to steer his course over long distances by straight lines without the continual adjustment of compass readings. He used this projection in his map of the world of 1569. For the rest of his life he was mainly occupied by his great Atlas.

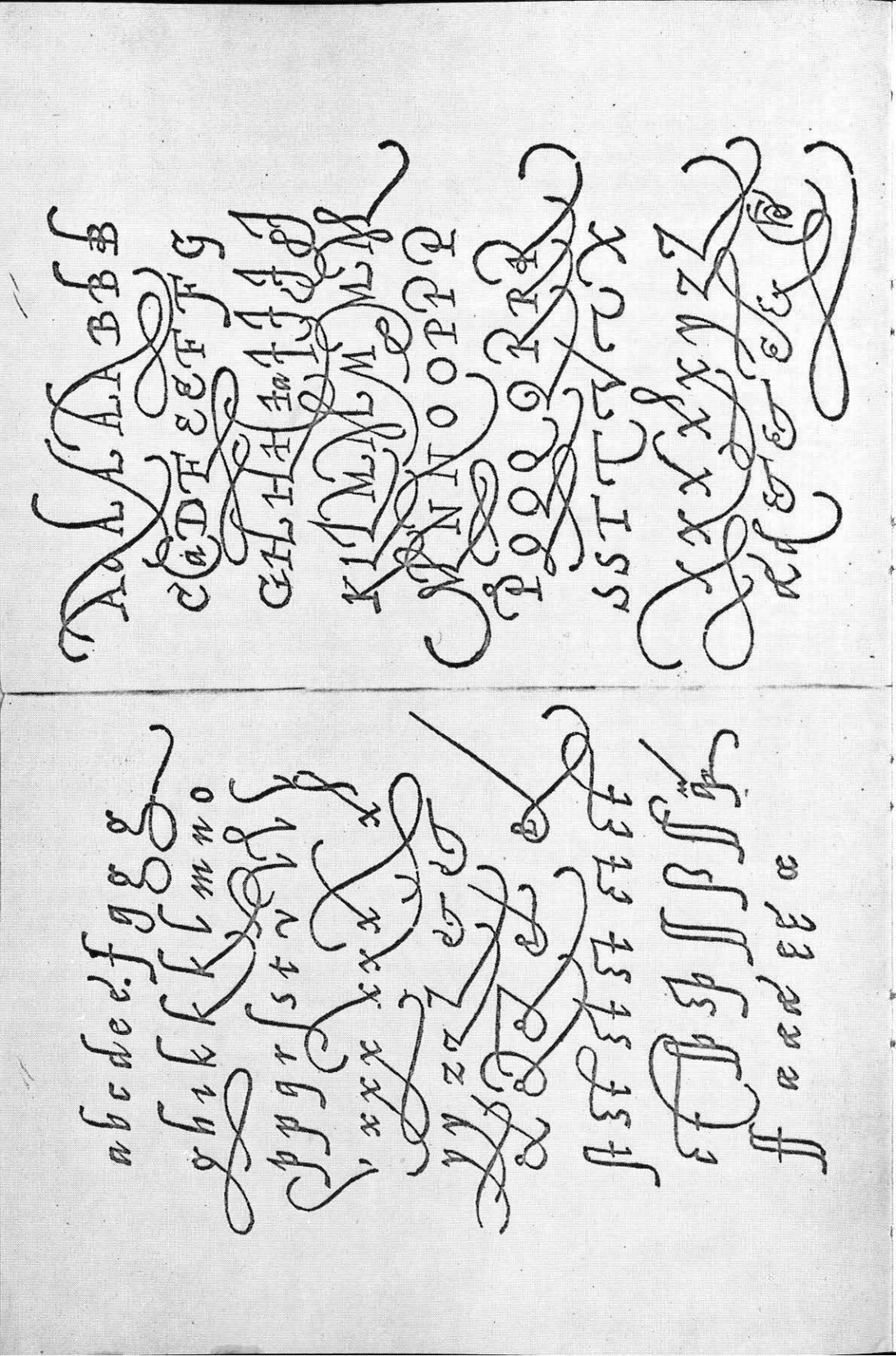
Walter Ghim gives an attractive account of Mercator's closing years:

"From the time when Gerard Mercator came here to live, I saw a lot of him because we were friends and neighbors, but I never found him idle or unoccupied; he was always busily engaged in reading one of the historians or other serious authors, of whom he had a fine stock in his library, or in writing or engraving, or was absorbed in profound meditation. Although he ate and drank very little, he kept an excellent table, well furnished with the necessaries of civilized living. He took the greatest care of his health. If he did have anything wrong with him, he repaired immediately to his good friend, Dr. Solenander. In debate, he displayed a most acute and well-trained mind; in the work of his profession, he was indefatigable. In time of good fortune and prosperity, he behaved with moderation; in adversity, with great patience." On May 5, 1590, he was attacked by paralysis in his left side. The end came four years later.

Mercator has left us specimens of work from all periods of life, so that we can see exactly how his hand developed over a span of more than fifty years. This information is supplemented by many manuscript letters that have survived from his correspondence. From this abundant material we are able to identify the characteristics of his hand with great certainty.

A good starting point is his textbook on lettering (Fig. 6), which I have mentioned. In this he gave instructions, with several examples, for writing his version of the italic or chancery script, which had been perfected in Italy at the beginning of the sixteenth century. His textbook was first published at Louvain in 1540 and went into five main editions. This little treatise is much prized by modern calligraphers. It is perhaps the clearest and most complete exposition of the subject, and stands comparison with the classic writing-books of the Italian masters of the sixteenth century (e.g., of Arrighi,[1] Tagliente,[2] and Palatino[3]). It is unique in that the author not only composed and wrote out the text and illustrations, but also engraved the whole work most skilfully on wood blocks.

Mercator introduces into his model two important modifications that are hardly ever found in formal italic lettering before 1540—namely, the letter *k*, in which the more commonly used upper bowl is



replaced by a diagonal line; and the letter *y*, in which the second stroke—the long curving down-stroke on the right—is introduced by an upward diagonal flick, instead of coming in with a bend from the right. Other points to bear in mind are the rather aggressive top of the letter *c*; the first version of letter *g*; the varieties of the ampersand; and the generous lengths of the ascenders and descenders.

The capital letters also have some typical fingerprints: *B* and *D*, with the ends projecting a little untidily from asymmetric curves; *F* and *T*, in which the cross-piece at the top droops downward; the various versions of *I*; the rather ornate *M*; *V*, in which the left stroke is curved and the right stroke rises straight and tends to be exaggerated. There are many others. If we look back at the three examples of Sebastian de Re and Bossius Belga (Figs. 3–5), we shall not find these features regularly appearing.

Between 1540 and 1550 Mercator pruned his style and adjusted his script so that he could inscribe long passages of descriptive matter on copper plates. Compare, for example, the lettering on his map of Flanders of 1540 (Fig. 7) with that of his map of the British Isles of 1554 (Fig. 8). Yet the script of the latter is basically the same. We see typical features: the *y*; the three separate ampersands in the first paragraph; the characteristic shapes of *c* and *g*; the flourished *M*; the drooping *T*; the proportions of the ascenders and descenders. Notice also the diphthong *Ae* in the word *Aegyptum*, which is exactly the same as that in the writing book. There is also the overall character of the hand—neat, regular, meticulous and, at the same time, natural and easy.

This rapid and incomplete survey has, I hope, shown that we can acquire a fully-documented picture of Mercator's script from a study of his many productions. Our knowledge enables us to gain some insight into his activities. For example, at the age of 23, he worked with Gaspar a Myrica on Gemma Frisius's globe of about 1535. Both men were employed as engravers. It is clear that, whatever else he contributed, Mercator executed the lettering, although it might reasonably have been supposed that Gaspar a Myrica, an experienced goldsmith, was the natural choice. Again, the lettering on the scientific

Figure 6. From Mercator's writing book *Literarum Latinarum . . . scribendi ratio*, Louvain, 1540.

Figure 7. From Mercator's map of Flanders, 1540.

Figure 8. From Mercator's map of the British Isles, 1554.

instruments produced in the workshop started by Gemma Frisius at Louvain and later run by Arsenius proves that Mercator must have exercised considerable influence in this enterprise since his script is employed as a model.

Another useful point that we can establish is that, up to and including his great Map of the World of 1569, Mercator engraved all his own work. Thereafter he relied more on other engravers, working closely to his models. The maps in the Atlas of 1595 show evidence of at least three engravers. His son and pupil Arnold, who helped him later in life at Duisburg wrote an italic hand based on his father's.

Some time ago my attention was drawn[4] to several annotations in the margins of the famous manuscript of the Gospels, the *Codex Argenteus* now preserved in Uppsala. The annotations are actually in two separate hands. When I obtained photographs, my curiosity was aroused by one of them. The proportions and the general look of the letters were familiar. There were also interesting details (Fig. 9); e.g., the characteristic abbreviations; the capitals *C*, *J*, and *E*; the amper-

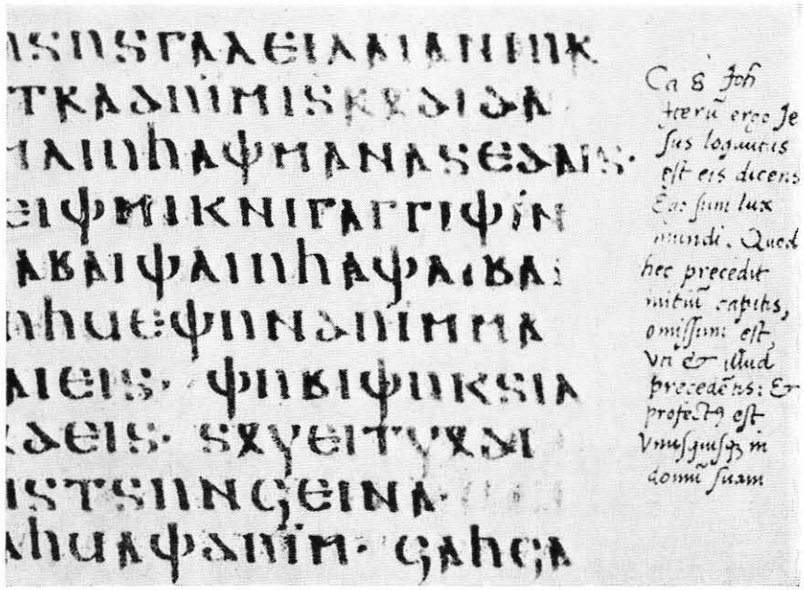
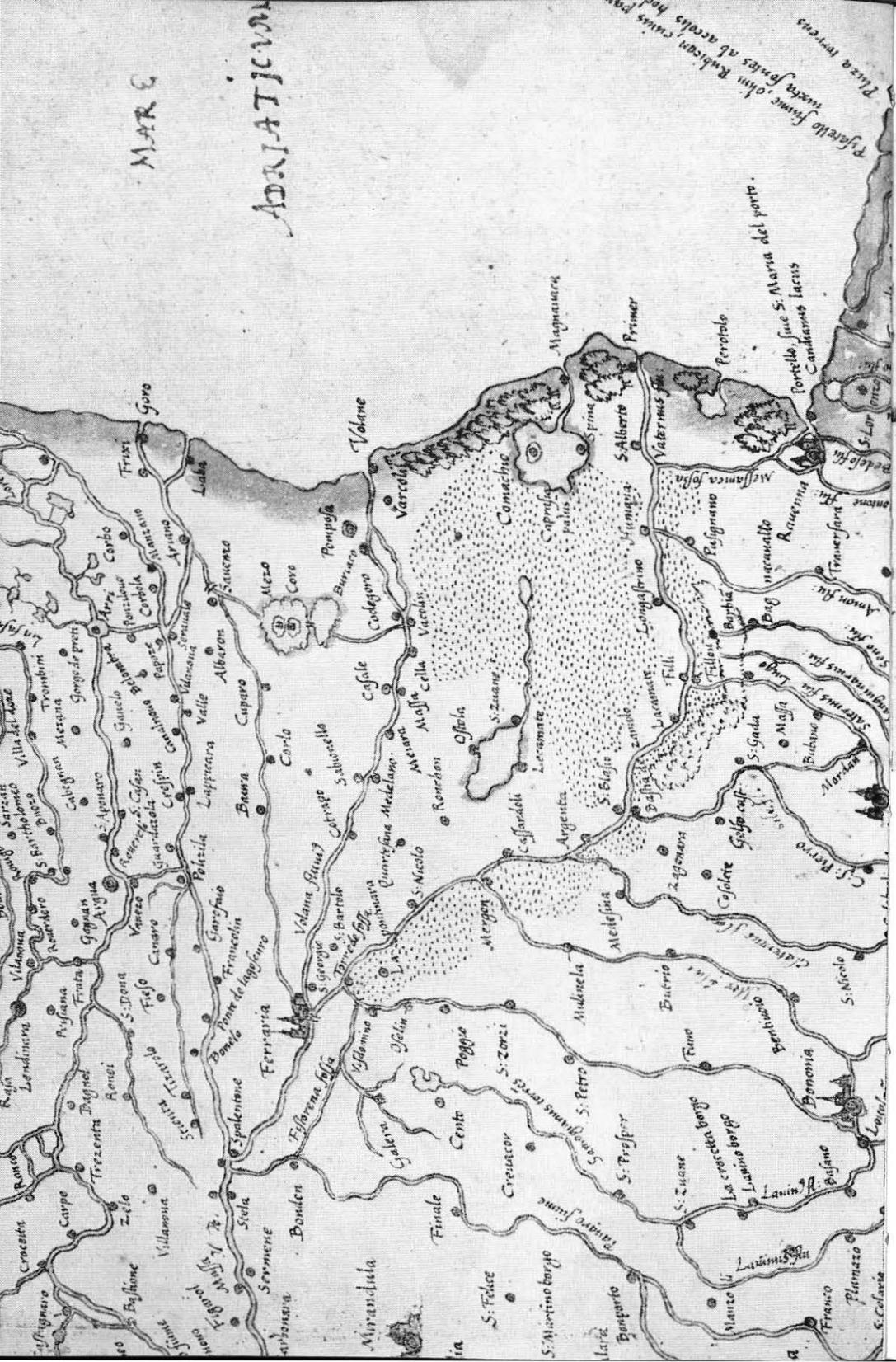


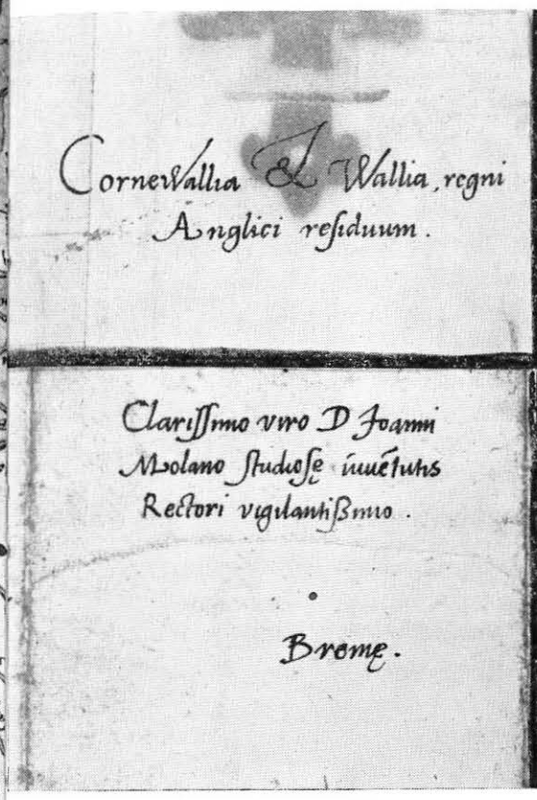
Figure 9. From the *Codex Argenteus* at Uppsala.

sand and the small *v* and *g*. On enquiring into the history of the Codex, I learned that in the 1570's it spent part of its troubled life in the Abbey of Werden near Cologne and that the Abbot had asked for assistance in sorting out the order of its leaves. Two men then living in the neighborhood were in fact involved in the matter: the scholar George Cassander, who had "discovered" the manuscript, and I was not surprised to learn that the other was his friend Arnold Mercator, the son of Gerard. The characteristics of the script resemble those of the elder Mercator pretty closely. We know that at this period Gerard Mercator was studying the New Testament, and was composing a commentary in Latin on the first part of St. Paul's Epistle to the Romans.[5] It seems to me, therefore, quite likely that Arnold Mercator sought his father's advice and that the latter annotated the Codex for him. The other hand is probably that of George Cassander.

Until recently, it seemed unlikely that further important specimens of Mercator's work would await discovery. But in 1967 a schoolmaster, while on holiday in Brussels, bought an old atlas. It contains several known maps by Mercator and Ortelius as well as two original manuscript maps. The latter are lettered in a calligraphic hand suitable for engraving. There are also handwritten titles to the maps, added by the compiler of the atlas. A calligraphic analysis yields interesting results.

The general style, arrangement, and size of the script in the two manuscript maps is very similar to that of the maps in Mercator's Atlas (Fig. 10). On examination, details of the script betray many correspondences with Mercator's work (particularly that shown in Figs. 6 and 8). There is, of course, the typical Mercator *y* and *k* (not seen in the portion shown here); the forward bending *C* (e.g., in *Cupara*, *Corla*, *Casale*); the *B* with its projecting lines (e.g., in *Bonden*, *Bononia*); the flourished *A* (e.g., in *Adese*): the asymmetrical *D* (no clear example here); the drooping *F* and *T*, (e.g., *Ferraria*, *Faenza*, *Trezenta*); *G* in, e.g., *Galera*, *Gelso*, etc.; the flourished *H* in Humana; *I* in Imola; *L* in *Legnano*, *Laba*; *V* in *Volana*. A convincing detail is the contraction in *hodieque*, which is precisely that in *hicque* in Figure 8, line 21. The proportions of *ſ* and the long sibilant—and, in general, the ascenders and descenders—are those favored by Mercator; the doubled *s* (e.g., in *Cassiano*) is identical with his model. Over and above these tangible details of similarity (of which only a few are





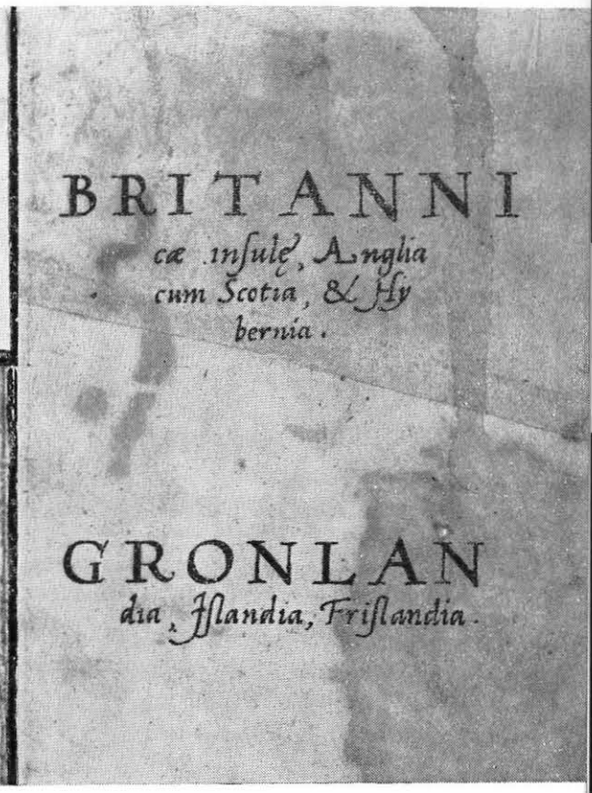


Figure 11. Lower left-hand, from a letter of Mercator to Molanus dated July 27, 1576; upper left-hand and right-hand, from a manuscript attributed to Mercator.

Figure 10. From a manuscript map attributed to Mercator.

mentioned), we must take into account the overall effect of the script —its professional appearance, legibility, sustained regularity, and unforced mastery of the chancery hand. In our assessment we must also remember that these manuscripts maps were probably copied at speed; the frequent placing of the dot to the right of its parent letter *i* is an indication of this. These and other points establish a strong case for considering Mercator the author of the manuscript maps, particularly as, of all the other engravers and cartographers of the time, there seems to be no one (with the possible exception of his son Arnold) whose hand is so similar that he could be regarded as a candidate for the authorship.

This conclusion is reinforced by a study of the other hand-lettering in the atlas. This is larger and more like handwriting than the former which, as I said, was intended for engraving (Fig. 11, right-hand and upper left-hand).

We can approach our analysis from at least three angles:

(a) First, by comparison with other known maps of Mercator. Here I draw your attention to the words *insularum* (line 2) and *Scotia* (line 19) in Figure 8 and their close similarity with the words *insulae* and *Scotia* on the right-hand side of Figure 10. Other similarities will be found on close examination.

(b) Secondly, by comparison with the models in the writing book (Fig. 6). Typical similarities are the *y* in *Hybernia*; the diphthong in BRITANNI*cae*; and the long sibilant in *residuum*, *insulae*, *Islandia*, and *Frislandia*; and two varieties of ampersand; the *g* in *regni* and *Anglia*; the capital C in *Cornewallia*; the *I* in *Islandia* and the *F* in *Frislandia*— all these in the space of a few words.

(c) Thirdly, from examples of his personal correspondence of the period. Unless he was approaching a prince or other important dignitary, Mercator usually wrote his letters in the workaday script that he was taught at school, the "secretary" hand as it is called. But when he addressed his letters, he felt the need for a touch of greater formality and clarity, so he often wrote the address in a deliberate chancery hand. The titles on the newly discovered atlas are written with the same intention and in the same way. The lower left-hand portion of Figure 11 is an address written on the letter that Mercator

wrote to Molanus on July 27, 1576. The three pieces in Figure 11 seem clearly by the same hand.

Calligraphic evidence, then, provides us with a strong chain of reasoning to identify Gerard Mercator as the compiler of the atlas and as the author of the two manuscript maps which it contains.

It can be fairly argued that this method is not totally scientific and lacks the precision which can be obtained, for example, in criminology by electronic scanners. This is undoubtedly true and it is obviously desirable that calligraphic evidence should be backed by other evidence. I would only make two points. First, instances can be cited where the same attribution has been made independently by more than one scholar using this method or where an attribution made solely on calligraphic evidence has been subsequently validated by other means. Secondly, that in the last analysis, we may be forced back to imponderables, in which even a computer will not help. Here, as in other arts, the great masters leave an indefinable mark of authenticity. When we see a canvas or hear a piece of music for the first time, we may experience an instantaneous recognition, which makes us say, "Only Rembrandt could have painted this" or "Only Beethoven could have written these bars." I personally think this to be also true of Mercator.

The application of calligraphic analysis to cartography is, of course, beset with a great practical difficulty: the technique demands a detailed knowledge of historical hands, a very sharp eye, and a flair for discovery. Such a combination of qualities exists only in a handful of dedicated scholars whose interest is concentrated on palaeography and does not ordinarily extend to cartography; on the other hand, most cartographic scholars will scarcely have the time to acquire the technique of calligraphic analysis and to keep abreast with the constant discoveries in a relatively unexploited field. But I do not think we should regard the gap as unbridgeable.

1. Ludovico degli Arrighi: *La Operina . . . da imparare di scrivere littera Cancellaresca.* Composed about 1522 but exact date of publication not certain, Rome.

2. Giovanniantonio Tagliente, *Lo presente libro.* Venice, 1524.

3. Giovambattista Palatino, *Libro . . . Nel qual s'insegna à Scriver ogni sorte lettera.* Rome, 1540.

4. By Herr Rolf Kirmse of Duisburg.

5. Unpublished manuscript in the University of Leiden.

This article is a slightly revised and expanded version of a paper read at the Third International Conference on the History of Cartography at Brussels in September 1969. Grateful acknowledgements are made to the Trustees of the British Museum, the National Maritime Museum at Greenwich, the Plantin-Moretus Museum at Antwerp, the University Library at Uppsala, and Mr. T. R. Varekamp of Amsterdam, for help with photographs. Some material in the article was previously published in *The Journal of the Society of Italic Handwriting* and in *Mercator* by A. S. Osley (London: Faber and Faber, 1969).

The Development of Vidifont

Rudi Bass

Television news broadcasting requires alphanumeric composition processes that do not depend on handsetting or photographic preparation. Vidifont, a synthetic video version of the CBS News 36 alphabet, was especially designed for television requirements: (1) proportional-width and proportionally-spaced letterforms for legibility and maximum character count, and (2) a unique grid structure to reproduce ovoid letter curves and angle strokes. The development of Vidifont is outlined and illustrated; esthetic values in electronic letterform design are discussed.

Research into the factors that govern the acuity, perception, and legibility of type on television was begun at CBS in 1966. Comparative tests made on the closed circuit monitor led, under my direction, to the design of CBS News 36 (Bass, 1967). Although the characteristics of this typeface are based on the requirements of television reproduction, it is essentially a font to be composed by hand and to be "seen" by a video camera. The source of the CRT image remains a graphic product, whether reflective artwork or projected slide.

Television, and news broadcasting in particular, needs typesetting processes that do not depend on handsetting and the photographic preparation of typographic images. The computer-driven character generator creates and transmits letters without mechanical or optical typesetting and printing and without "taking a picture" of graphically prepared letterforms. Since television offers a ready interface for such video-compatible electronic character generation, it seemed desirable to transfer the applicable design characteristics of our special font to an electronic alphabet.

With the completion of the original CBS News 36 font, the Graphics Department of CBS News began a study of synthetic video alphabets. Such alphabets should not be confused with graphic letters designed for optical character recognition or for computer-driven optical type-

setting. Neither should we range them among computer-generated but not video-compatible alphabets. Both stroke-drawn or dot-matrix CRT displays of alpha numerics still require being "looked at" by a video camera. Since the transmission goes from phosphor (display CRT) to phosphor (receiving set), this method exaggerates the halation at the top of the light scale and the fall-off at the end of letter-strokes, a degradation always a characteristic problem of superimposed type on television (Fig. 1).

An examination of various synthetic alphabets resulted in these conclusions:

1. While the vertical grid of the matrix was determined by the scanning lines, the horizontal grid was not detailed enough to construct the variety of angles and curves necessary to create readily legible and esthetically pleasing letterforms (Figs. 2 & 3).

2. The dictates of the computer logic forced the letters into a procrustean* standard width that compacted wide letters such as M and W (Fig. 4). On the other hand, wide counters or large inter-letter spaces such as I L T A created uneven typographic color. There is some room for argument to what extent good typographic color contributes to legibility. I doubt that print measurements can be applied directly, since television exaggerates uneven brightness (Fig. 5).

3. At the time of design, no lower-case fonts were found.

In all fairness, it must be said that since many of these systems seemed to have been plotted by electronics engineers and not by typographic designers, we cannot fault these technicians for their pre-occupation with the engineering requirements of the system.

A synthetic font designed by the U.S. Air Force on a 9 × 11 matrix (Fig. 2) shows all the defects of graphic oversimplification, such as equal-space positions and letter structure held to horizontal, vertical, and 45° angle dot-strokes. A 28-line high system (Fig. 3) based on a character structure of uniform 5 × 7 ratio (i.e., 28 lines high and 20 elements of differentation wide) is made up of units of individual

*Procrustes, the hospitable giant of Greek mythology bid travellers to stay the night at his house. Short ones were stretched, tall ones were amputated to fit them properly into the bed he had prepared for them.

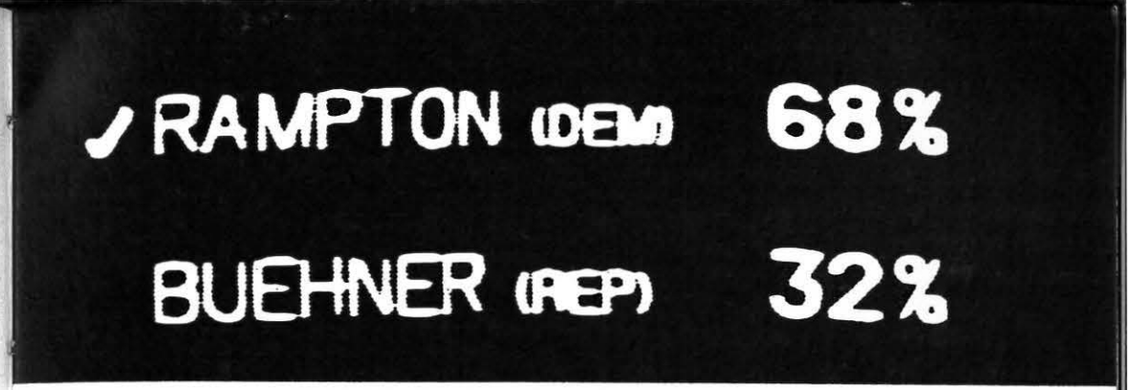


Figure 1. Television image of point-to-point CRT display. The uneven length of the vectors making up each letter results in uneven brightness. This exaggerates degradation, first on the original display and second on the receiver after transmission. Note not only the extreme halation, but the uneven letterheight, as in "BUEHNER."

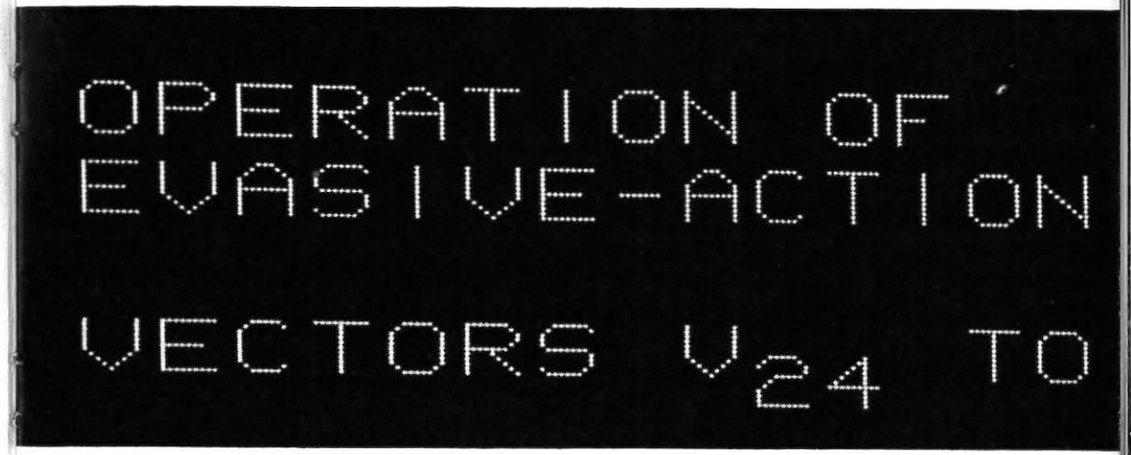
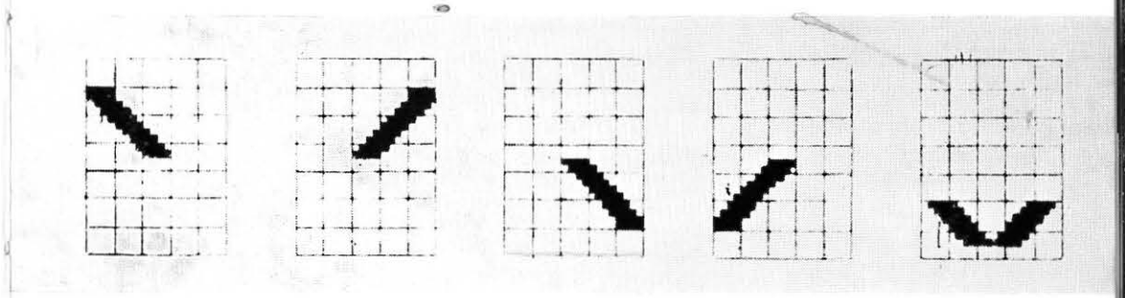


Figure 2. 9 × 11-grid synthetic letters, like others of similar construction, are awkward in form and show the random inter-letter spaces characteristic of equal-space systems, as in "ACTION."

Figure 3. Signal diagrams for a 28-line font. The 5 × 7 grid has four scanning lines for each vertical grid space, the four-fold delay gives four positions for each horizontal grid space. The first and second signal make up the inside strokes of the letter M.



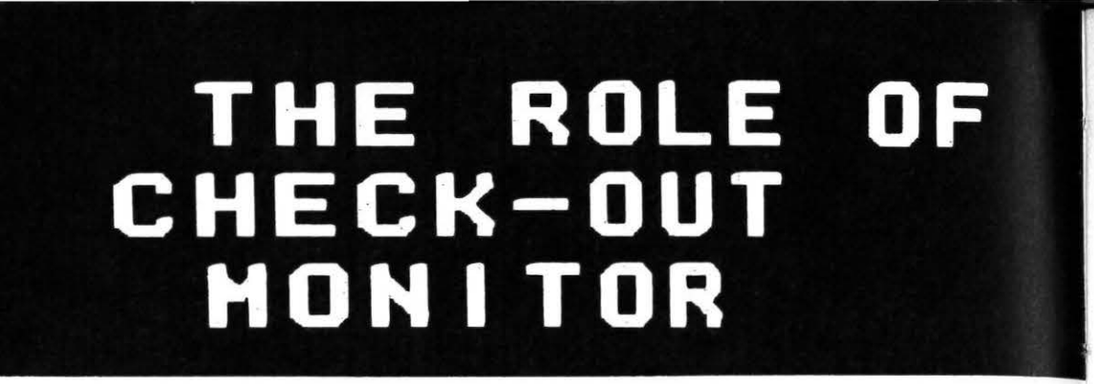


Figure 4. Video-image of the 28-line synthetic font. The 20 horizontal positions are not sufficient for definition. The equal-space construction results in visual confusion; note H and M.

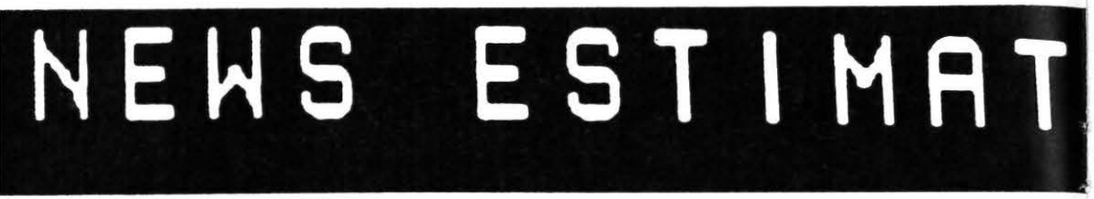


Figure 5. 28-line synthetic capitals, characterized by angular design and equal letter width, resulting in uneven typographic color, as in "ESTIMATE." Equal character slotting restricts count to 16 positions across the screen. The aspect ratio is distorted due to irregular linearity.

signals. The total letter image still is characterized by awkward angularity.

To subordinate esthetic considerations to technical needs—to let material create form—indeed, to elevate technical requirements to the level of esthetics is a tradition that is much older than the Bauhaus. Margaret Shanahan's early Salem alphabet (Fig. 6A) is based on a grid pattern determined by linen and cross stitch. Around 1834 Dr. Louis Braille perfected his alphabet for the blind (Fig. 6B), structured on a two-by-three dot matrix. A set of archaic Chinese characters is built on a logic system of strokes imposed on and governed by a seven-by-nine grid (Fig. 6C). And the deaf-mute alphabet (Fig. D) based on neither graphic nor electronic patterns is nevertheless defined by the pattern limits of one thumb and four fingers. Even contemporary graphic designers such as Wim Crouwel (Fig. 7), preoccupied with what seems to be the design logic of today's technology, are more than willing to narrow the areas of legibility.

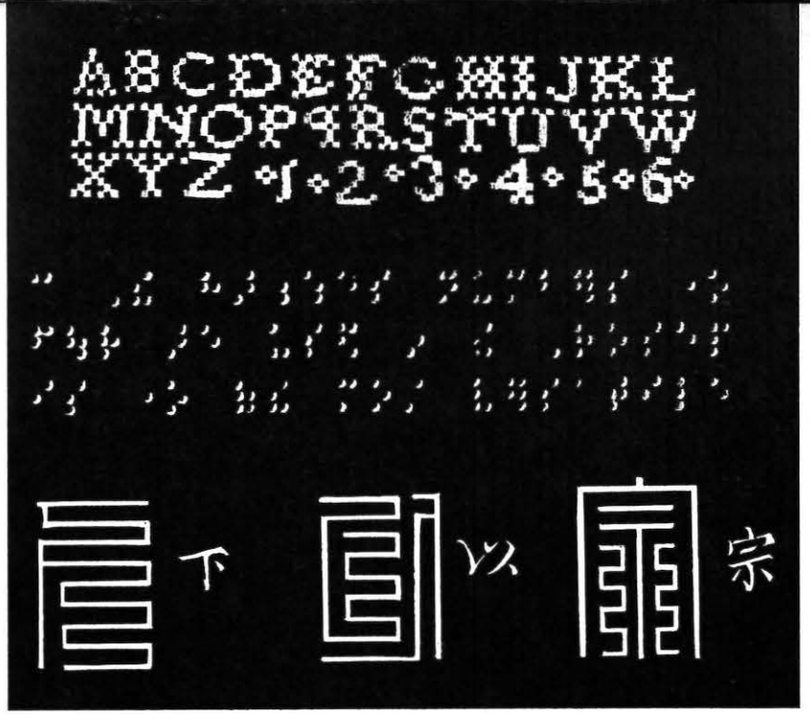
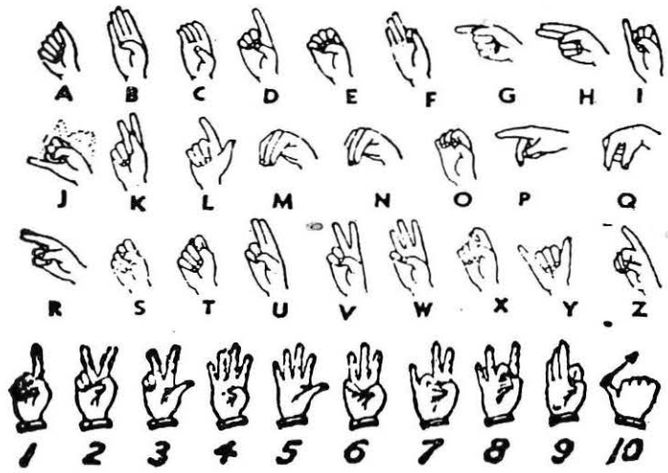


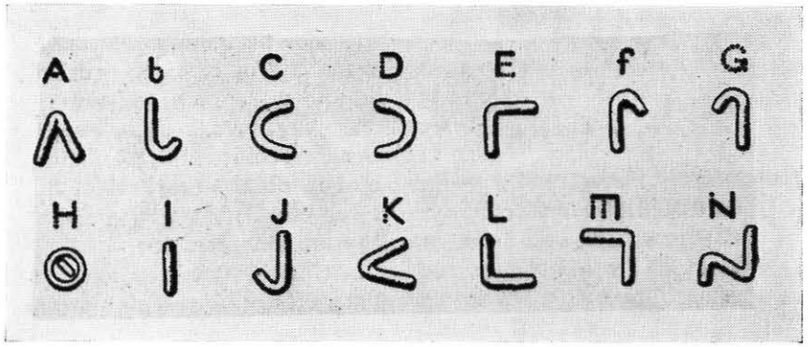
Figure 6. A. Eighteenth-century American sampler, basic 5 × 7 grid. Degraded negative forms emphasize, as in some synthetic video letters, the disproportion between heavy strokes and narrow counters.
B. Braille. Since tactile acuity is less than visual acuity, a 2 × 2 grid was chosen over a typical 5 × 7 matrix, a grid too restricted for letterforms but sufficient for abstract symbols.
C. Archaic Chinese characters; 7 × 9 grid.
D. Deaf-mute alphabet. Although the "grid" limitations are severe, the visual variations are considerable. The "font" even introduces motion within a single symbol (10), a concept impossible in print but theoretically attainable in a synthetic video font. (Note the "blink" built into the Vidifont system.)



But there are thresholds in character recognition that should not be crossed for the sake of simpler forms, if legibility is to be retained. Adaptability to the needs of electronics prompted Crouwel's severely structured and abbreviated letterforms. It was exactly the opposite intent—a desire to add recognition factors to the abstractions of the Braille alphabet—that caused Dr. William Moon of Brighton to design a new alphabet for the adult blind (Fig. 8). His 1847 letterforms anticipate, for altogether different reasons, some of the letters of the Crouwel font. While Moon's alphabet assists those who cannot see, the contemporary font refuses to help those who can see, for the sake of the assumed requirements of the cathode ray tube.

Figure 7. Alphabet designed for cathode-ray-tube typesetting by Wim Crouwel.

Figure 8. Alphabet for the adult blind by Dr. William Moon.



The viewer-reader's need to differentiate at a glance not only between individual letters but also between graphemes, words, and sentences means that awkward letterforms are not enough. Legibility demands a full range of angles and elegant curves. (I use the word "elegant" not to denote style but the way the mathematician uses it, meaning apt, proper, simple.) What then were the specifications for a synthetic alphabet that would combine video technology with the graphic qualities necessary for character perception?

1. A logic grid sufficiently detailed for the precise reproduction of the CBS News 36 font.

2. A memory capable of assigning un-equal spaces to all letters to allow for varying letter width and proportional letter spacing.

3. At least two font sizes, and a lower-case alphabet for the larger font.

4. It was clear that it would not be necessary to reproduce the "light traps" at the inside corners of the original CBS News 36 alphabet (Fig. 9). Since the synthetic alphabet is generated without optical reproduction of a graphic image, the problems of halations and flux would not pertain to the same degree. Another advantage of the digital generator is the fine control. Since character information is controlled by the sync references, there is no un-even scanning as with the traditional technique of super-imposition of type by optical means.

Because of the considerable display degradation on the average aging home television screen—badly tuned and beset with poor reception—it is important to aid the viewer-reader by transmitting as clear and differentiated a letterform as possible. Far from being a somewhat strange and "computerish" looking typeface, a synthetic video font at its best should combine all the traditional advantages of good typography with the precision and fine control that electronic generation affords.

With these parameters as background, I assisted CBS Laboratories in translating the CBS News 36 alphabet. CBS Laboratories personnel, under the direction of Stanley Baron of the Electronics Systems Department, developed the digital technology necessary to generate a synthetic video version (Figs. 10–19).

Vidifont, the resulting alphabet, consists of a 28-line font of capitals and lower-case letters and an 18-line font of capitals. Research

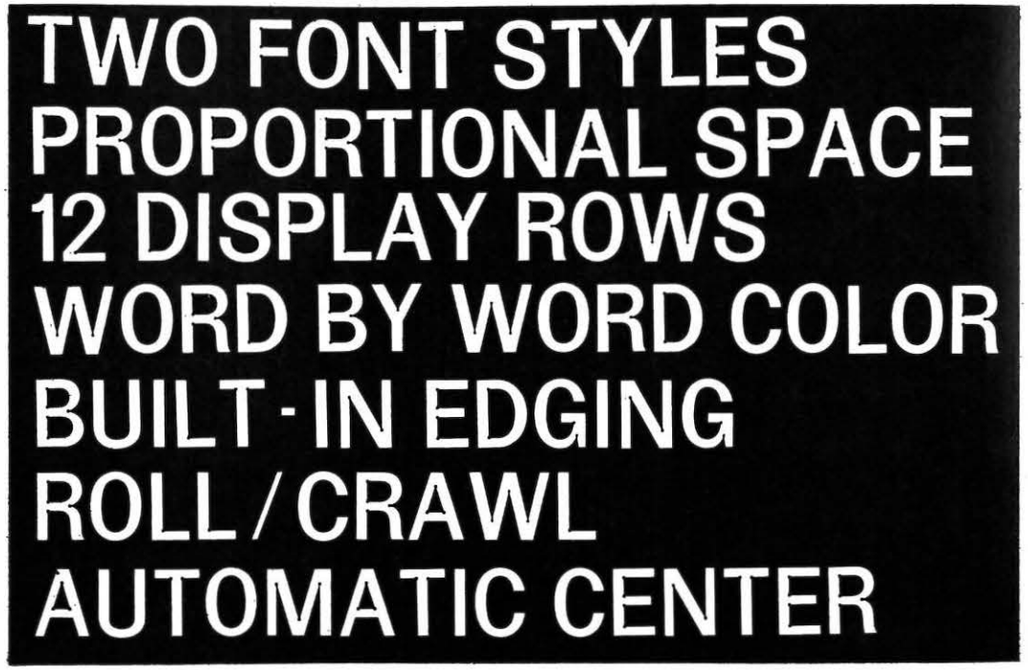
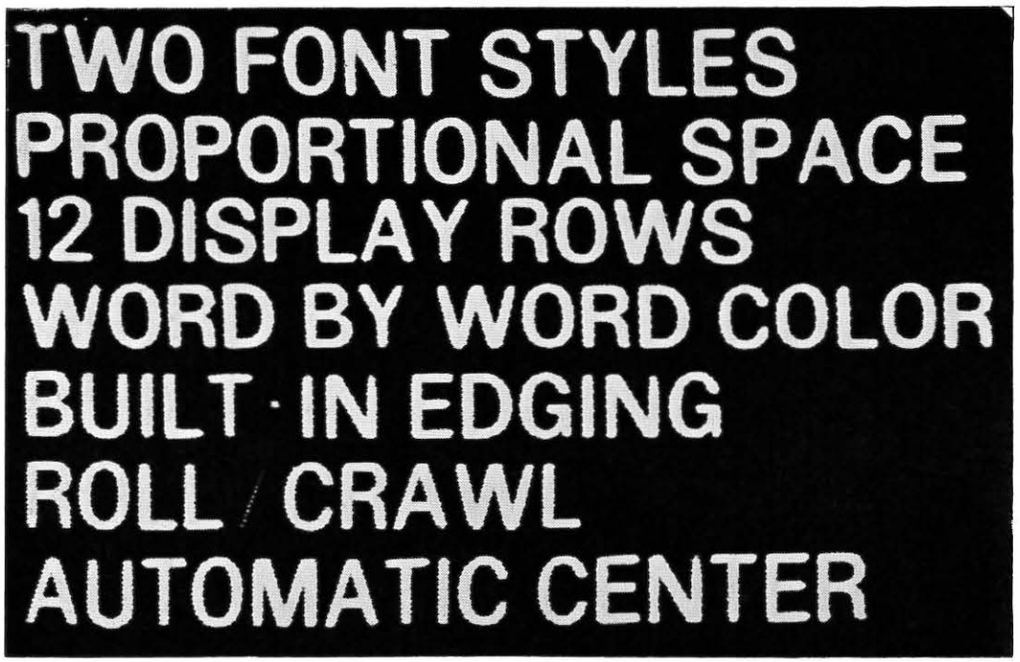


Figure 9. A. CBS News 36 capitals, print.
B. CBS News 36 capitals, video image of slide-chain projection. Note that the inside corners retain sharpness but stroke terminals show various stages of degradation.



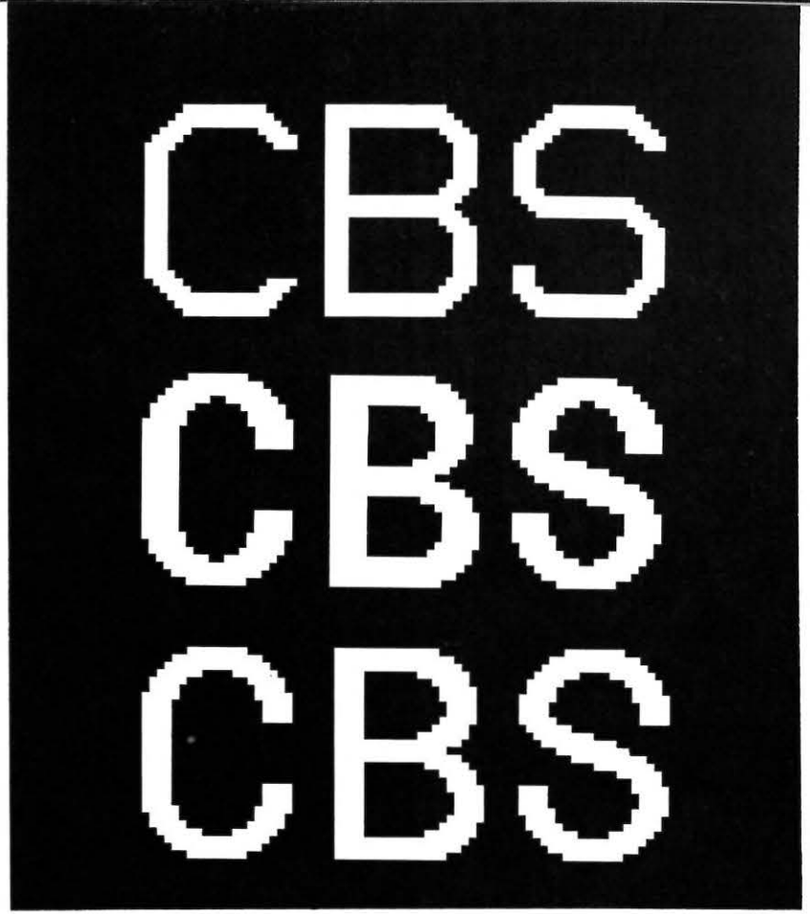


Figure 10. Diagram of initial variations of Vidifont letters. Stroke width varies from three to five elements. Four-element width was eventually chosen, but elements are halved to permit greater definition.

Figure 11. Video image of intermediate stage of Vidifont character. Curves are still flat-sided.

performed by Mitre Corp. (Bell, 1967) for the Air Force Systems Command, Electronic Systems Division, determined that 12 resolution lines per symbol height was the absolute minimum below which the viewers' error rate became unacceptable. The IBM Advanced Systems Development Laboratory, in looking into legibility requirements (Neil, 1967), concluded that 15 lines was an acceptable minimum, but that the preferred type display should be 30 lines high. The NBC recommended practice based on the Society of Motion Picture and Television Engineers safe action and title areas (SMPTE, 1968) calls for a minimum letter height of 4.5% of the vertical scanned area or "about" 22 lines, since the size of the actual scanned area is somewhat variable.

Vidifont's 28-line font is quite close to the recommended 30 lines and the 18-line font lies between the suggested minimum limits of 15 or 22 lines.

The system provides four basic functions: interface, timing and control, memory, and character generation. Keyboard entry governs all composition as well as the functions of line positioning, centering, tab set, roll, crawl, and blink; it permits deletion and close of a character, a line, or the full page; the display can be pre-set on a monitor and scanned-in on command, or composed in real time.

Like the original CBS News 36 font, the Vidifont alphabet has proportional letterforms. The letter I, for example uses only a quarter as much space as the letter W. This aids character-structure and legibility, and gives us a character count that makes full use of the limited "type-page" of the television screen.

An important aspect of Vidifont's technology is its unique grid structure. While Vidifont shares with all synthetic video systems its dependence on the horizontal scanning lines, its vertical grid details twice the number of signals. An average letter of 7 to 5 ratio (i.e., 28 lines high and 20 comparable elements wide) is actually built on the basis of 40 elements across its width. This permits the ovoid "basket" curves so necessary for letters such as O, C, G, or inverted curves such as S or lower-case a. The 1 to 2 ratio of the grid also accommodates the variety of straight slopes necessary to differentiate between symbols such as: 5 (82°), W (76°), V, A, M (73°), N, X, Y (63°), K, Z (58°), 2 (40°).

Although the translation of the original alphabet is quite precise,

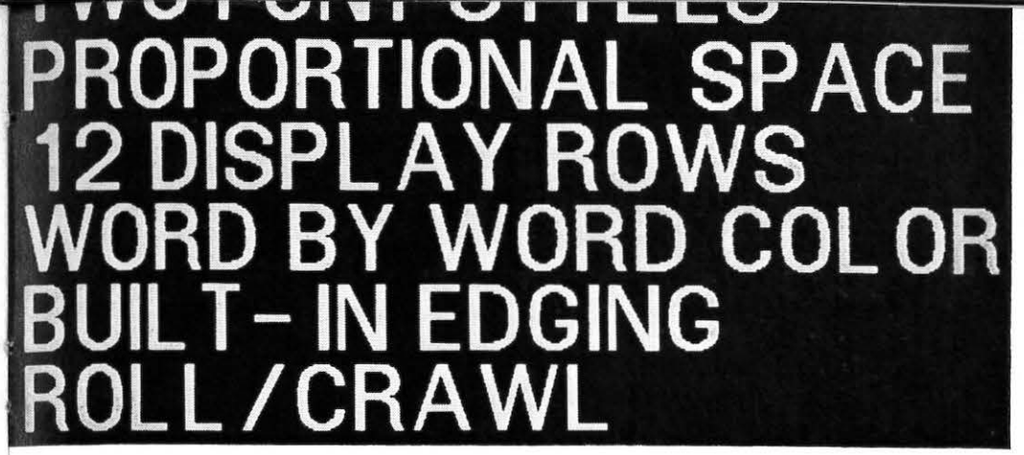


Figure 12. Vidifont 28-line capitals. Sharp monitor image retains precise stroke terminals. Font shows proportional character design of CBS News 36, but proportional spacing detector has not yet been completed, note "PA" in "SPACE."

there are specific differences that are due to trade-offs or other demands of the memory. The M and N, for instance, share the same commands to reduce memory. Therefore, the vertical strokes of the N are of unequal weight (Fig. 12). In the V the weight of the two strokes is reversed. Both these aberrations have since been corrected in a revision of memory functions. Memory demands also created a G that lacked the short straight down stroke of its original.

Since "type-page" size on television is bounded by the screen and margins—unlike print margins—are not certain, and because there are limits to the letter size the system as well as the eye can resolve, character count is perhaps the single most important factor in video composition. The proportional rather than the equal width construction of the Vidifont alphabet and the proportional spacing (yet to be completed) offer a very economical character count. The new font of 28-line caps permits an average of 22 characters to the line, as against a 16-letter count for a fixed-letter-width 28-line system. Aspect ratio can be further condensed 10% to allow for some added letters. Aside from this intended flexibility, video aspect ratio will fluctuate at times due to variables in linearity and result in the equivalents of "regular," "condensed," and "extended" versions of a print face (Figs. 10, 14 & 19). In such cases, the character presentation was improved by memory reduction. But in other instances, the numerals primarily, degradation that was unacceptable to the eye did occur and the font was revised to allow for individual character properties. Since

Figure 13. Schematic drawings of the Vidifont 28-line capitals. Note that the D in this drawing does not yet show the full curve since achieved. The N shows already equal verticals; the V has since been reversed to follow traditional weight.

Figure 14. Monitor image of the Vidifont 28-line capitals. Attenuated "condensed" scan helps to visualize grid structure of curves and angles.

Figure 15. Schematic drawings of the Vidifont 28-line alphabet.

Figure 16. Schematic drawings of the Vidifont 28-line lower-case alphabet.

numerals, unlike letters, cannot depend on context as an aid to character recognition, it was important to allow for sufficiently differentiated forms.

The memory's shift register insists on either all even or all uneven signal positions for curves and slopes along a scanning line within a given character, and a choice had to be made in some instances between two equally less-than-perfect solutions. Such incongruities aside, we consider the graphic quality of Vidifont an important step forward in synthetic video design.

The figures shown detail the present development of the font. The next stage of the system will provide proportional letterspacing, as well as an added font size.

Some thoughts about the relationship of esthetics to legibility might be in order. Most reading tests have dealt with measurements such as point size, weight, leading, reflexivity of paper, and other print-related factors. Now that the cathode ray tube presents new design problems, the question is asked whether drastically altered letterforms or even "non-objective" fonts might not only be easier to generate but be actually more legible. It is my view, not as a researcher but as a practicing designer, that esthetic values are not a random grouping of artful foibles, superimposed on solid measurable elements, such as length of ascenders or stroke-to-counter ratio. How we feel about the way type looks is a part of the historical development of letterforms and readers as well, with legibility the dialectic result of all these factors, along with blink rate and column width.

Varied as typefaces are, they share a common rhythm, a time-line pulse that should not be easily interrupted. It would be technically possible to let a radically new or disproportionate alphabet spring from the head of the computer, the Zeus of our time. I do not think it to be humanistically advisable. Even seemingly secondary design factors—such as the precise nature of curves or the interplay of interletter spaces and letter spacing—have their anthropocentric origins. They stem from the literally "graphic" (i.e., written) relationships of hand and chisel, quill and parchment, pen and paper. I do not think that they can be abandoned with impunity.

Ever since its first cultural revolution in 1919, China has attempted to broaden the printed base of its many spoken languages. It not only

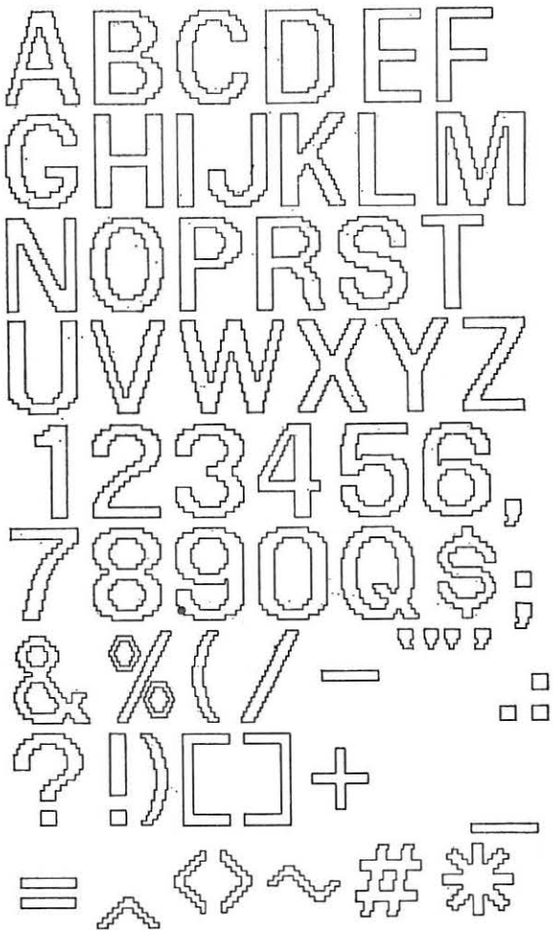


Figure 17. Schematic drawings of the Vidifont 18-line capitals.

Figure 18. Monitor image of Vidifont title, 28-line capitals. Wide scan extends letters beyond normal aspect ratio.

created the national phonetic letters and attempted to simplify and reduce the 40,000-odd ideographs to a manageable 1000, but even today it continues to some degree the use of the Pin-Yan Ju Man national romanization system to familiarize its people with the roman alphabet.

There is the growing danger that the proliferation of our media-oriented culture contributes to dehumanization and alienation.* We could well speculate whether unlettered cultures, where inter-personal relationships cohere without the mortar mixed with the 26 grains of sand our letters represent, are not as valid as ours. But for better or worse we must consider our alphabet and our neural and affective response to it is a part of our ecosystem. And, like water and air, we had better take care of it.

* Claude Levi-Strauss sees it as a loss of "authenticity": "We communicate with the immense majority of our contemporaries by all kinds of intermediaries—written documents or administrative machinery—which undoubtedly vastly extend our contacts but at the same time make those contacts somewhat "unauthentic" (1967). Norbert Wiener suggests that more information is possibly less information: "It is no wonder that the larger communities . . . contain far less available information than the smaller communities, to say nothing of the human elements of which all communities are built up" (1948).

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Creating a Mundurukú Orthography

Marjorie Crofts

Mundurukú, a Tupi language of an Amazon Basin Indian people, has had no written form. This article describes the practical problems of establishing an alphabet to match the spoken language as well as relate to Portuguese, the language of Brazil; e.g., whether or not to represent all phonemes, and basic questions on what constitutes a word, or a sentence. Printed materials in Mundurukú are illustrated.

When we realized that we would be able to "create" a Mundurukú[1] alphabet for a people who had never seen their language in print, we were excited. We were the first people to put this language into writing and make a practical alphabet with the aim of teaching the Mundurukú to read their own language. The speakers were illiterate in Mundurukú when we arrived. Five or six had learned to speak some Portuguese from the Franciscan priests, and three or four of these could read Portuguese. None had ever read Mundurukú. It was in our hands to open to them the whole world of reading.

1. Mundurukú is a Tupi language, as classified by Arion D. Rodrigues, (I.J.A.L. 24.3 [1958]). It is spoken by about 1,200 inhabitants of the upper Tapajos River and its tributaries of Das Tropas, Cabitutú, Cadiriri, Cururú, and São Manoel in the state of Pará, Brazil. Very few of these Mundurukú speak Portuguese. Some 350 Mundurukú live north of this principal location of the tribe, on the Canumã River in the state of Amazonas. The latter group speak Portuguese in their homes and only six or eight adults still speak the Indian language. Field work was carried on under the auspices of the Summer Institute of Linguistics and the Museu Nacional of Rio de Janeiro in this latter location during 1961–63 and in the Cabitutú River area since then. We have also enjoyed lovely hospitality for several months at various times at the Franciscan Mission on the Cururú River. My colleague, Margaret Sheffler, has co-authored with me all the literacy materials. There are about thirty fluent readers in the tribe now. Four or five of these had learned something about reading while in school for a year or two in Portuguese. The others learned as adults with no literacy background. Only three of these are women.

We wrote a set of five primers to teach the letters of the alphabet, with charts for practicing syllables and little stories made up of letters already taught in the series. Following these primers are a set of four "readers"—books with stories from Mundurukú mythology and descriptions of everyday tribal life. These are intended to give the new readers speed and skill in reading—to take them from sounding out syllables or reading hesitatingly, to flowing, expressive reading.

We want them to learn to read so well in their tribal language that they will have minimum difficulty in learning to read in Portuguese, the language of Brazil, when they become bilingual. With a highway planned which will lie close to the tribal area, we know that this is not too far away.

Now we could create "the alphabet to end all alphabets"—the one in which each symbol would represent one and only one phoneme[2] and people would become literate in no time at all. The alphabet would be so "perfect" that they would just glide from one primer to the next and come out fluent readers. Then we started grappling with the problems of making such an alphabet!

In this paper I briefly outline these problems and our present solutions. These will be discussed under the following headings: 1. symbols for segmental phonemes, 2. word break, 3. morphophonemic writing, 4. supra-segmental symbols, 5. sentence punctuation, and 6. Portuguese orthographical problems and loan words.

2. For the purposes of this paper, which focusses on the practical problems of establishing an alphabet rather than linguistic theory, we shall talk of "phonemes," or those sounds distinguished as "different" by native speakers of the language.

1. Symbols for Segmental Phonemes

The following is a list of Munduruku phonemes and their symbols.[3]

Vowel	*Symbol*	*Consonant*	*Symbol*
i	i	p	p
ĩ	ĩ	t	t
ɛ	e	č	c
ɛ̃	ẽ	k	k
ɨ	u	ʔ	'
ɨ̃	ũ	b	b
o	o	ǰ	j
õ	õ	s	s
a	a	š	x
ã	ã	h	h
		m	m
		n	n
		ŋ	g̃
		w	w
		y	y
		ř	r

2. Word Break

One of the continual problems in setting up an orthography is deciding "what is a word?" We are writing many bound items as free words. Post-positions (like English prepositions) are written as free words, though they are bound phonologically. All of the morphemes[4] which we call "aspects" and which mark what we usually call "tense," are bound, but are written as free words. We were influenced to do this by Portuguese, which writes words of these word classes as free words. We also reduce the frequency of long words, though it cannot be proved whether or not this makes reading easier.

3. For a full description of the sound system see "Mundurukú Phonology" by Ilse Braun and Marjorie Crofts in *Anthropological Linguistics*, Vol. 7, No. 7, Oct. 1965. This describes in detail the phonetics of the language from single sounds in a syllable up to sentence intonation.

4. We shall define a morpheme as "the smallest meaningful unit of sound" for the purpose of this paper. For instance, in the English word "boys" there are two morphemes; boy "child of the male sex" and -s "plural."

3. Morphophonemic Writing

We have sets of words with two phonologically-conditioned allomorphs (forms with the same meaning, but different phonetically), i.e., post-positions that begin with d- following vowels and with t- following consonants. We could choose a base form to use throughout, but since d and t are full phonemes, we write these phonemically, not morphophonemically. We have not found that this causes any confusion.

4. Supra-segmental Symbols

The nasalization mark over vowels is used in Portuguese most often in some vowel clusters, where the first vowel of the cluster is marked as nasal, but both vowels are nasalized, i.e., cão "dog," põe "puts." In a few words single vowels are nasalized, i.e., lã "wool." Other nasalization occurs phonetically, but is marked orthographically by a word-final m, i.e., cem [sẽ] "100," bom [bõ] "good," sim [sĩ] "yes." This may cause some confusion for Mundurukú readers learning to read Portuguese, since the nasalization mark in Mundurukú represents heavy nasalization over the vowel on which it occurs. However, the symbol represents nearly the same phonetic phenomenon.

There are four emic[5] pitches in Mundurukú—three of tone, and laryngealization, which is usually the lowest in pitch. Much has been written recently about whether tone need to be represented in an alphabet.[6] The arguments seem to center about whether tone

5. The terms "emic" and "etic" are basic to the tagmemic theory of linguistics, on which the analysis of Mundurukú was made. These are defined by the one who coined them as follows: "The etic viewpoint studies behaviour as from outside of a particular system, and as an essential initial approach to an alien system. The emic viewpoint results from studying behaviour as from inside the system. (I coined the word etic and emic from the word phonetic and phonemic, following the conventional linguistic usage of these latter terms. The short terms are used in an analogous manner, but for more general purposes.)" *Language in Relation to a Unified Theory of the Structure of Human Behaviour* by Kenneth L. Pike, 2nd ed. (The Hague: Mouton + Co., 1967), p. 37.

6. For further reading about problems in representation of suprasegmental phonemes, see: "A Tone Orthography for Trique" by Robert E. Longacre, *The Bible Translator*, Vol. 4, No. 1, Jan. 1954. And for discussion about not representing all the phonemes or tonemes, see "Bases for Formulating an Efficient Orthography" by Paul S. Powlison, *The Bible Translator*, Vol. 19, No. 2, April 1968; "More on

carries a heavy functional load or not. This was what made us decide not to write Mundurukú tone, which seems to be like "icing on the cake." It carries next to no functional load. There are thirty tone pairs or so, but many of these are words of different word classes—a noun and a descriptive verb, for instance; i.e., i³pi³ "earth" and i³pi² "it hurts." Most of these pairs are clearly distinguished by context.

There are a few places where tone perturbation needs to be marked in the orthography, however, or the reader has to back up an entire clause.[7] The last syllable of all question words carry tone 2 (next to the highest). When the question word is head of a genitive phrase, however, this tone is perturbed to tone 3 (lower); which, in turn, perturbs the preceding syllable. We have chosen to mark this perturbation with a hyphen. This enables the reader not to stumble as he reads. Hyphen, then, marks tone perturbation in genitive question phrases; i.e., a³bu² "who," but a²bu³duk³ʔa² "whose house" (written: abu-duk'a). a³jo² "what," but a²jo³ xe²ʔe² "the skin of what" (written: ajo-xe'e).

Post-positions are not free words, but we write them as free words (see Section 2). When these occur with question words, tone perturbation occurs, and we mark this also with hyphen, i.e., a²bu³ kay² "toward whom"; a³bu² "who" kay³ "toward" (written: abu-kay).

5. Sentence Punctuation

We use sentence punctuation as close to Portuguese punctuation symbols as possible. One problem in this area is whether to write according to phonological or grammatical analysis. What is a sentence? Is the sentence "He came, he saw, he conquered" one

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Formulating Efficient Orthographies" by Sarah C. Gudschinsky, *The Bible Translator*, Vol. 21, No. 1, Jan. 1970; "Toneme Representation in Mazatec Orthography" by Sarah C. Gudschinsky, *Word*, Vol. 15, No. 3, Dec. 1959; and "Native Reactions to Tones and Words in Mazatec" by the same author, *Word*, Vol. 14, No. 2/3, Aug–Dec, 1958.

7. Gudschinky, op. cit., cites an example of similar ambiguity when tone is not represented in the orthography, and an intelligent, educated native speaker of a tone language of West Africa needing to read a sentence through to himself before he is able to read it aloud (p. 23).

sentence, or three? Does the comma in this English sentence stand for rising intonation? If it does, and we use intonation as a criterion for sentence break, there will be some Mundurukú sentences with six or eight verbs, separated by commas.

We teach capital letters and all the punctuation marks necessary from the first page of our first primer. Very early in the primer series we use charts with a lower-case and upper-case letter together, to show that they are "nearly the same."

Following the five primers that teach the alphabet, we have a set of four readers.[8] In these readers we include all of the punctuation marks that we know occur in the New Testament, which we expect to publish eventually. This includes quotes, quotes within quotes, and quotes within quotes within quotes. The question of quotation marks is of special interest because there is a morpheme (i) in Mundurukú which marks quoted material, i.e., ejẽm i João o'e "'come here,' John said." Quotes are used very frequently in daily conversation and in story-telling, as are quotes within quotes, which are marked by two juxtaposed, but clearly pronounced i's, i.e., ebapũg̃ em napa ma ẽn em 'wetaybit g̃u ixem' i, i o'e "three times you will lyingly say 'I don't know him,' he said." Technically, we would not have to use a punctuation mark at all to mark quoted material, since there is an overt morpheme to mark this. But, we are using the Portuguese symbols to facilitate transition to Portuguese (with the i morpheme, of course). Quotes within quotes within quotes are not marked by three juxtaposed i's, but by word order. Thus we are using: to mark first quote, with i at the end; " " to mark quote within quote; and indentation to mark the third level quote.

6. Problems in Relation to Portuguese Orthography and Loan Words

There are some problems posed to those who will learn to read Portuguese after learning to read Mundurukú with this orthography.[9] The range of back vocoids from [u] to [o] comprise one

8. Probably the most thorough and most practical guide to primer construction in unwritten languages (or any others), and the basic guide for our work in this is Sarah C. Gudschinsky, *Handbook of Literacy*, Summer Institute of Linguistics, Univ. of Oklahoma, 1962; and "Recent Trends in Primer Construction," *Fundamental and Adult Education*, Vol. XI (1959), No. 2, by the same author.

9. A good number of articles in *The Bible Translator* are dedicated to consideration of the prestige language in establishing orthographies for newly-written languages.

phoneme. It was almost a toss-up whether we used o or u to symbolize this phoneme. We chose o. The first problem resulting from this choice was that the name of the tribe, pronounced by them [mũnj̆uruku] came out spelled mõnjoroko. This appears on the covers of all the primers and readers. It is bad publicity for those interested in linguistic work and seeing these primers as representing what is supposed to be a scientific alphabet. Were we to do it again, we would use u for the back vowel phoneme and o for the mid-high ɨ.

The symbol t represents the same sound in Portuguese as in Mundurukú. In Portuguese, however, where it precedes front vowels, it is pronounced [č] in the tribal area of Brazil, which is a separate phoneme in Mundurukú. It would help in the transition to Portuguese were we to represent the one Mundurukú phoneme with two letters to parallel Portuguese usage. The symbol k is used in a few loan words in Portuguese, such as kerosene and Kodak, but is "foreign" and it might have been better not to use it. Had we used c for [k], we could have used ch for [č], but it is always more difficult to teach two symbols for one phoneme.

The symbol j̆ represents [ǰ]in Mundurukú, but [ž] in Portuguese, which will be one more thing for bilinguals to re-learn.

Neither w or y occur in Portuguese except in borrowed words. These tend to make the alphabet look "foreign." However, words occur like [iuɨiuɨi] "is washing it" and [ĩũɨũĩĩ] "is arrowing it" and [iioiioi] "is frying it," which are more correctly spelled iwuywuy, iwũywũy, and iyoyyoy, respectively, than with seven vowels. Phonetic differences clearly distinguish w and u, and i and y.

The symbol that is most "far out" is g̃, which represents a phoneme with three allophones (variants): ŋ syllable-finally following nasal vowels, gŋ syllable-finally following oral vowels, and ñ syllable-initially. Mundurukú have absolutely no trouble with this symbol, but it will be a hurdle to learn two symbols in Portuguese in its place: m (as in the word Belem) and nh [ñ]. There is no equivalent to the second variant. On the other hand, the emicness of this symbol and the fact that the symbols for the Portuguese equivalents are so different may make it the easiest to re-learn in Portuguese.

These appear in the following volumes of that publication: 3:59, 5:35 ff., 5:45 f., 5:175, 6:125, 7:19 ff., 8:39, 9:183, 10:53 f., 10:62 f.

Some loan words have letters which do not occur in the Mundurukú alphabet. Since this tribe already has contact with Brazilians and will have much more soon, many more will be learning to speak and to read Portuguese. In dealing with the loan words already in use in the tribe, we have three choices. We can transliterate all of them, substituting for the sounds that do not occur in Mundurukú the sound (and symbol) closest to it phonetically, or the one used by them in pronouncing that word (if that is different). Or, we can spell the loan word with Portuguese spelling and let them struggle to learn a few new symbols. Or, thirdly, we could transliterate the Portuguese words used in Scripture which are completely new to them (such as place names), but use Portuguese orthography for the words with which they are familiar (some names for persons). We have chosen to spell with straight Portuguese orthography. We feel that this will show them that we believe that they can learn these "odd" words. To transliterate would be an insult to their intelligence. As the tribe learns more and more Portuguese, the books printed in Mundurukú will not be tossed aside because they are written "down" to those not knowing any Portuguese.

Whereas it is a real challenge and thrill to "create" an alphabet for a tribe becoming literate, there are problems involved. These range from deciding whether or not to represent all the phonemes, whether to represent them one-for-one or otherwise, to omitting symbols that look "foreign" and questions like: what is a word? what is a sentence? and, how shall I spell these words so that this book will still sell fifteen years from now?

It is a great thrill to see a people reading their own language for the first time in history. We were teaching one 45 year-old chief to read in a men's reading class one day. The Mundurukú seldom show much emotion, but he really got excited. He had discovered what a syllable was! He threw up his hands and exclaimed, "Oh, what a wonderful book this is!" That makes it worthwhile struggling with the problems!

Wuyjuyũ yaberenat'a o'yamuy uk'a. O'yamuy ip Topaĝa a'õ kay'ũm puye. Yaberenat'a muy ojuy ip tũy be oca'õbuyxi jĩjã iãn o'e ip puye. Topaĝa bodi ma iãn o'e ip.

—Oca'õbuyxi jĩjã, i napa ma o'e ip soat pe wuyjuyũ be.

Koap pima pũĝ'a'õm ma kawẽnwẽn osodop ip ipi daĝayũ. Topaĝa ibu'u jĩjã osunuy ixeyũ be yamuy am. Imẽnpuye ixeyũ a'õ o'ya'õmuwarurun. Pũĝpũĝ ixeyũ in pũĝ'a'õm o'jekawẽn. Warara'atayũ bit wara'at'a'õm jekawẽn Topaĝa ixeyũ a'õ o'ya'õmuwarurun puye. Imẽnpuye itaybit ĝu o'e ip jebureyũ ekawẽn. Oibu'un ip yamuy am jebureyũ ekawẽn itaybit'ũm puye. Yamuy am o'jepere ĝu ip. Iĝo'a butet Babel i osunuy.

1. Ajo'a muy ojuy ixeyũ wuyjuyũ?
2. Apẽnpuye yamuy ojuy ip?
3. Apẽnpuye Topaĝa ixeyũ a'õ o'ya'õmuwarurun?

Gênesis 11:1-9.

Above and on the following page are examples of the new Mundurukú written language as created by Marjorie Crofts. Similar printed sheets will be tipped-on pages of a Portuguese language Bible story book so that the readers can lift the Indian language sheets and compare sentences, word-for-word, with the Portuguese. Composition of the Mundurukú material is by Cascade Publishing Company, Portland, Oregon, on a specially-adapted IBM Selectric Composer. Characters that are not needed for Mundurukú are filed off a standard Selectric "golf ball" and replaced with new Mundurukú characters and accents—which have been cast in plastic, glued on, and given a thin metal plastic coating. A memory unit programmed into the machine stops the carriage when the operator strikes an accent, permitting the next letter to be impressed directly under the accent.

Other authors treating problems in making orthographies are: Kenneth L. Pike, *Phonemics*, Chapt. 16, Ann Arbor: University of Mich. Press, 1947; "Orthography Studies: Articles on New Writing Systems" by William A. Smalley and others (in *Helps For Translators, Vol. VI* [United Bible Societies]) (Amsterdam: North-Holland Publishing Company, 1964), p. 173. *The Bible Translator* has had several articles on orthography construction in general: "How Shall I Write This Language?" by William A. Smalley, Vol. 10, No. 2, April 1959; "Practical Limitations to a Phonemic Alphabet" by E. A. Nida, Part I, 5:35 ff., Part II, 5:58 ff. "Orthographic Problems in Yipounou", 1:110 ff., "Dialect and Orthography in Kipende" by William A. Smalley, 9:63 ff., "Problems in Orthography Preparation" by William A. Smalley, 5:170 ff.

Topaĝa kaxi o'ĝubapuk. Kuyje soat eipi daĝ kabiok osodop. Iba'ore wuyjuyũ eku am kabiok taĝ. Ka'ũma ma wuyju ijojom kabiok pima. Imẽnpit soat eipi daĝ kabiok osodop kuyje. Ka'ũmĝu tumũn'ip'ip osodop. Ka'ũmĝu tumũntitit osodop. Ka'ũmĝu wasũ osodop. Ka'ũmĝu puca osodop. Ka'ũmĝu tumũn'a'a osodop. Ka'ũmĝu wuyjuyũ osodop. Soat taĝ kabiok osodop. Topaĝa bit ibu'u o'e soat taĝ kabiok am.

–Kaxi oĝuĝe ipi mukabia am, io'e Topaĝa.

Imẽnpuye Topaĝa kaxi o'gubapuk ipi mukabia am. Kabiok ĝu osodop ĝebuje bit.

1. Apẽn osodop ipi daĝ kuyje?
2. Topaĝa du ibikuy o'e soat taĝ kabiok am?
3. Abu kaxi o'ĝubapuk?

Gênesis 1:2-5.

Cebay o'jekawẽn Jacó eju.

–Obadipyũ kay juy eju. Ibocewi ayacat etojot etayxim, io'e.

Jacó o'ju wũyatka kay–jebay badipyũ ka kay. Cucum pima o'xet e bidase. Wita'a jeje ya'a o'xet. O'jexeyxey. Wadakĝũn o'jojojo jexeybi. Kabi kadi yabi osunuy. Ipi ju yopkobi osunuy. Topaĝa a'õ dujowatwat'ukayũ kopkom ip o'e wadakĝũn taĝwi, jeuhum tak. Topaĝa cũĝ'i o'jojojo wadakĝũn abi be kabi kadi jexeybi.

Ĝebuje Topaĝa o'jekawẽn Jacó eju.

–Soat idip je'e ewebeam ẽn wa'õ kay jĩjã buye. Exe okukpin. Imẽnpuye eweju ojukuku ĝasũ bit. Aĝ õn ekay, io'e Jacó be.

Cewurũĝ puje Jacó icokcok cĩcã o'e Topaĝa o'jekawẽn buye jexeybi.

1. Apẽn Jacó o'e e bidase?
2. Ajo o'jojojo jexeybi?
3. Pomawiat wadakĝũn?
4. Topaĝa o'jekawẽn tu ceweju jexeybi?

Gênesis 28:10-16.

Type Design Classification

Walter Tracy

To follow the article by Gerrit Noordzij (*The Journal of Typographic Research*, IV [Summer 1970], 213–240) which analyzed the German classification, an account is given of the French and German classifications. It is shown that all three schemes have the same structure though the nomenclature is different. Hope is expressed that the British classification will be acceptable in the United States.

Gerrit Noordzij's article in the Summer 1970 number of this journal was chiefly concerned with the fraktur letterform. To show that even in Germany there is misunderstanding of fraktur, he criticized the "Klassification der Schriften," DIN 16 518 (1964), the original text of which was reproduced in his article. Readers not directly engaged in printing may wish to know that DIN 16 518 is not the only one of its kind. A similar classification was published by the British Standards Institution in 1967, and this article will show that the German and British classifications are very close to the one devised by Maximilien Vox in France in 1954.

It is not the purpose here to defend the classifications against the assertion in the introduction to Mr. Noordzij's article that "current systems of typeface classification are fundamentally useless as they isolate type from other renderings of handwriting." The fact that the pre-history of type design is to be found in handwriting is interesting but of little value in the practical affairs of typography and printing today.

The need for a classification is as obvious in printing as it is in botany or any other subject which has to be taught by some people and learnt by others, and where the "materials" of the subject are diverse in style and numerous in quantity. From the beginning of the nineteenth century the range of type designs developed to such an extent that type-founders and the writers of trade manuals found it

necessary to identify specific groups of designs and apply names to those groups. Until recently, in the English-speaking world, the principal groups of text types were called: Old Face (Old Style in America), Transitional, Modern, and Old Style (Modernized Old Style in America). Venetian was sometimes used to describe faces based on the Jenson type. The main groups of display types were named Script, Sans-serif, and Egyptian or Antique, with Black-letter (under various aliases) in occasional use.

When the basic differences in the type designs represented by these groups were understood, the groups themselves were found to cover the majority of types fairly adequately. But the *names* of the groups were very unsatisfactory. Old Style and Modernized Old Style are vaguely chronological but convey no real sense of period. Modern is hardly appropriate for a class of design which was created in 1784 and wide-spread by 1810; and Transitional is a neutral term, not a descriptive one. The names for the display groups are equally obscure. Script does convey the idea of written form, but Sans-serif indicates only what the letters do not possess, and Egyptian needs a knowledge of the social consequences of Napoleon's conquests. A first-year student trying to separate in his mind the different forms of type designs might expect the groups to be named in terms which indicated origin or some aspect of shape or nature; instead, he had to learn a set of terms which were vague, untrue or confusing.

The classification generally used in France, Belgium, Italy, and some other countries was different but no better. It cannot have been very satisfactory to group all the text types from Aldus to Baskerville under the name Elzévir, or to include under the term Didot many faces not designed by members of that distinguished family; or to refer to sans-serifs as Antiques, especially when in the United States Antique meant a thick-seriffed letter and in Germany Antiqua was (and is) used to signify roman as distinct from black-letter. Francis Thibaudeau, who wrote a great deal on this subject in various journals and particularly in his *Manuel Français de Typographie Moderne* (1924), formulated a scheme on the proposition that all types except scripts can be classified by serif formation. For the several groups of letterforms he retained the traditional names: thus types without serifs are Antiques, those with square serifs (*empattements quadrangulaires*) are Egyptiennes, types with triangular serifs are Elzévirs, and those where

the stroke is finished with a thin horizontal line are called Didot. These main groups he sub-divided into variant forms: thus Scotch Roman was to be known as Didot, Type Anglais. This use of illogical terminology was a principal fault in Thibaudeau's system; it is absurd to describe a certain clarendon face as Egyptienne Americaine or to call a particular sans-serif type Antique Moderne.

As long ago as 1935 the late Beatrice Warde remarked upon the unsatisfactory state of descriptive terminology and proposed a new set of terms which would indicate differences of shape; that is to say, she adopted the morphological principle rather than the chronological. Her proposal was not adopted; indeed it would have been cumbersome because it lacked a range of convenient single-term "labels."

More recently the subject received the attention of Maximilien Vox, the distinguished French typographer. In 1954 he introduced the scheme which bears his name. Before describing his classification, it should be emphasized that there are two aspects of any such scheme: the number and kind of the various groups allowed for, and the names given to the groups. The names of the groups in the Vox scheme are bound to seem strange, at least at first, to anyone who is not French (even a Frenchman has to accept the fact that some of them are "synthetic" words). But M. Vox has himself said that this is not important—any other names or even numbers, may be used so long as the groups themselves are universally understood.

Rather than adopt existing words which might carry unwanted connotations, Vox chose to invent fresh names for the various groups. They are: Humane, Garalde, Réale, Didone, Mécane, Linéale, Incise, Scripte, Manuaire. Two of them, Garalde and Didone, refer to four great designers—Aldus and Garamond who flourished in the sixteenth century, and Firmin Didot and Bodoni who worked chiefly in the last quarter of the eighteenth century. Réale refers to the period 1740 to 1784, and is a graceful verbal gesture to the Sun King and the old regime. Linéale and Incise refer to form; and Mecane and Manuaire suggest the *means* rather than the result itself. The inconsistency in the names is compensated for by their convenience as one-word labels.

Although M. Vox made it clear that he thought the names of the groups less important than the groups themselves, he may have hoped

that some of the names at least would be adopted in countries outside France. But the compilers of the DIN 16 518 list abandoned Vox's terms entirely and chose a set of names which are inaccurate in one case (in no sense of the word can "Barock" be applied to Baskerville), and inadequate in another (Antiqua-Varianten seems almost as uninformative as "Miscellaneous" would be).

The members[1] of the panel set up by the British Standards Institution in 1966 to study the matter decided to adhere as closely as possible to the Vox plan, because it was considered broadly satisfactory in itself, it had the approval of the Association Typographique Internationale, and a number of European manufacturers had already adopted it. The British version of the classification forms part of the BSI publication BS 2961:1967 (the other part is a list of recommended terms and definitions for general typographic purposes). The actual classification is reproduced in Table I.

It can be seen that three of Vox's names—Garalde, Didone and Lineale—have been retained, and Humanist and Script are close to his terms. For the rest, Vox's names were thought to be too difficult for English tongues, and easier terms have been provided.

Some details of the classification are arguable. Bell should probably not have been included in the examples of transitional designs—in spite of Updike. The meaning (such as it is) of Transitional only appears when the student has understood the nature of Didone and Garalde. It is not good enough to say that Lineales are "typefaces without serifs"; the (apparent) equality of stroke thickness should have been referred to. Grotesque is a return to the sort of terminological inexactitude the authors were supposed to avoid. In the course of time some revision of those details may be attempted.

The nine groups in the classification structure will be found to account for most "Latin" type designs more effectively than do the traditional groups mentioned at the beginning of this article—if only because those widely-used faces which have some such name as Lining Gothic or Engraver's Gothic, and which hitherto defied classification, can be placed in Group VII. It is comparatively easy to place directly into one or other of the first four groups any text type which is a revival or re-cutting of a type originally made before, say, 1850.

1. The author was one of them.

Text types created during the past fifty years or so have sometimes been designed by men, such as W. A. Dwiggins, who have incorporated in their designs trace elements from two distinct groups, and sometimes by men like Bertram Goodhue or Eric Gill whose designs were highly personal. To describe such designs the use of a compound name is suggested. Thus Electra and Joanna might best be called Transitional-Didone, and Cheltenham Transitional-Slab-serif. (The comparatively modern innovation of the *bold* version of a roman face illuminates and emphasizes the need for compound terms—and even, as in the case of Times Bold, for a term different from the one used for the roman).

The classification is not all-embracing, though. Originality *does* flourish, even in such a crowded field. It must be allowed that any type which cannot be classified at all is probably so distinctive as to demand a special description, like the duck-billed platypus.

One objection which may be made is that the Garalde group has to include too wide a range of faces—designs as different as Garamond, Caslon, Old Style No. 7, Times Roman, and Vendôme. The British classification recognizes the need to sub-divide the Lineale group (see Mr. Noordij's criticism of the DIN group VI) and a sub-dividing of the Garalde group would be equally useful.

However, the classification is an aid to study, not a substitute for it; a means to an end, not the end itself. It is unprofitable for the novice to deplore the fact that the classification is not fully comprehensive. Better for him to admire the ingenuity of designers and enjoy the diversity of their designs—and to note that as he becomes more proficient in recognizing them, his need for the classification diminishes.

From the international viewpoint it is good that the Vox, DIN 16 518, and BS 2961 classifications are substantially of the same structure, as is shown in Table II. It is to be hoped that German experts will revise some details of the DIN scheme, and that interested people in the United States will give their attention to the British classification and decide to adopt it, with whatever improvements seem necessary.

Editor's note: see also an exchange of letters in the Correspondence section which includes a discussion of typeface classification systems.

TABLE I. *Classification of Typefaces*

Category No.	*Name*	*Description*	*Examples*
I	Humanist	Typefaces in which the cross stroke of the lower case e is oblique; the axis of the curves is inclined to the left; there is no great contrast between thin and thick strokes; the serifs are bracketed; the serifs of the ascenders in the lower case are oblique. NOTE. This was formerly known as "Venetian," having been derived from the 15th century minuscule written with a varying stroke thickness by means of an obliquely-held broad pen.	Verona, Centaur, Kennerley
II	Garalde	Typefaces in which the axis of the curves is inclined to the left; there is generally a greater contrast in the relative thickness of the strokes than in Humanist designs; the serifs are bracketed; the bar of the lower case e is horizontal; the serifs of the ascenders in the lower case are oblique. NOTE. These are types in the Aldine and Garamond tradition and were formerly called "Old Face" and "Old Style".	Bembo, Garamond, Caslon, Vendome
III	Transitional	Typefaces in which the axis of the curves is vertical or inclined slightly to the left; the serifs are bracketed, and those of the ascenders in the lower case are oblique. NOTE. This typeface is influenced by the letterforms of the copperplate engraver. It may be regarded as a transition from Garalde to Didone, and incorporates some characteristics of each.	Fournier, Baskerville, Bell, Caledonia, Columbia
IV	Didone	Typefaces having an abrupt contrast between thin and thick strokes; the axis of the curves is vertical; the serifs of the ascenders of the lower case are horizontal; there are often no brackets to the serifs. NOTE. These are typefaces as developed by Didot and Bodoni. Formerly called "Modern".	Bodoni, Corvinus, Modern Extended
V	Slab-serif	Typefaces with heavy, square-ended serifs, with or without brackets.	Rockwell, Clarendon, Playbill
VI	Lineale	Typefaces without serifs. NOTE. Formerly call "Sans-serif".	
	a Grotesque	Lineale typefaces with 19th century origins. There is some contrast in thickness of strokes. They have squareness of curve, and curling close-set jaws. The R usually has a curled leg and the G is spurred. The ends of the curved strokes are usually horizontal.	SB Grot. No. 6, Cond. Sans No. 7, Monotype Headline Bold
	b Neo-grotesque	Lineale typefaces derived from the grotesque. They have less stroke contrast and are more regular in design. The jaws are more open than in the true grotesque and the g is often open-tailed. The ends of the curved strokes are usually oblique.	Edel/Wotan, Univers, Helvetica
	c Geometric	Lineale typefaces constructed on simple geometric shapes, circle or rectangle. Usually monoline, and often with single-storey a.	Futura, Erbar, Eurostyle
	d Humanist	Lineale typefaces based on the proportions of inscriptional Roman capitals and Humanist or Garalde lower-case, rather than on early grotesques. They have some stroke contrast, with two-storey a and g.	Optima, Gill Sans, Pascal
VII	Glyphic	Typefaces which are chiselled rather than calligraphic in form.	Latin, Albertus, Augustea
VIII	Script	Typefaces that imitate cursive writing.	Palace Script, Legend, Mistral
IX	Graphic	Typefaces whose characters suggest that they have been drawn rather than written.	Libra, Cartoon, Old English (Monotype)

NOTE. The impossibility of placing every typeface into one of the categories above is recognized. In cases of difficulty the use of a compound term, e.g., humanist/garalde, is suggested.

TABLE II. *Comparison of Three Typeface Classification Systems*

	VOX	BS 2961	DIN 16 518
I	Humane	Humanist	Venezianische Renaissance-Antiqua
II	Garalde	Garalde	Französische Renaissance-Antiqua
III	Réale	Transitional	Barock-Antiqua
IV	Didone	Didone	Klassizistische Antiqua
V	Mécane	Slab-serif	Serifenbetonte Linear-Antiqua
VI	Linéale	Lineale a. Grotesque b. Neo-grotesque c. Geometric d. Humanist	Serifenlose Linear-Antiqua
VII	Incise	Glyphic	Antiqua-Varianten[1]
VIII	Scripte	Script	Schreibschriften
IX	Manuaire	Graphic	Handschriftliche Antiqua Gebrochen Schriften[2] a. Gotisch b. Rundgotisch c. Schwabacher d. Fraktur e. Fraktur-Varianten

1. By the description and examples given under this heading in DIN 16 518 (see *Journal of Typographic Research*, Summer 1970, p. 216) the group does not entirely correspond to Group VII in the other two classifications.
2. In the Vox and BS 2961 lists this class would be included in Group IX.

The following acknowledgment should have accompanied Leonard Boyle's article "The Emergence of Gothic Handwriting" in the Autumn 1970 number: Reprinted with kind permission from *The Year 1200 : A Background Survey* (The Cloisters Studies in Medieval Art II) published in conjunction with the Centennial Exhibition (1970) at The Metropolitan Museum of Art, New York; compiled and edited by Florens Deuchler.

Comment: Not Since Babel

Edmund Carpenter

We know almost nothing about the origin of language. Anthropologists don't always admit this to undergraduates, but among themselves (when they're not trying to impress anyone) they acknowledge that we don't know whether language dates from a million years ago, or half a million, or fifty thousand. There are lots of theories, but few facts—and the facts fit lots of theories.

It was once rather loosely believed that man was an alienated ape who, after becoming erect, commenced talking. This early walkie-talkie roamed several continents, producing pebble tools that remained nearly changeless for hundreds of thousands of years. Then, less than fifty thousand years ago, man burst forth with a plurality of tools and art that presupposed, it was assumed, the existence of fully-developed language.

Today it all seems more complicated, largely as a result of new fossil discoveries, as well as the findings of ethology and somatology. It has recently been suggested, for example, that language emerged from a wordless but not soundless ritual, like Eliot's, "The word within a word, unable to speak a word/Swaddled in darkness." Alan Lomax, from the study of ethnic music, concluded that song is "danced speech." Bess Hawes found that the underlying principle in the songs of the Sea Islander is the unheard beat—like an orchestra in which nobody plays the tune because everybody hears it. The underlying beat is a motor beat. The music is a dance executed while standing still.

Some of the undergraduates I teach in California—especially the more intelligent ones—remind me, in their incapacity for formal speech, of Lancelot Andrewes' "The Word, and not to be able to speak a word." Either they stand mute, with all the dumb pathos of

inarticulate farm animals, or they stammer, their faces twisting, like aphasia victims. What's called illiteracy is not ignorance of meaning, but non-sensitivity to word arrangements.

This retreat from language is surely one of the more interesting phenomena of our time. As George Steiner points out in *Language and Silence*, the syntheses of understanding which made common speech possible no longer work today. Large areas of meaning are ruled by non-verbal languages such as mathematics or symbolic language. Little or nothing is "verbal" in modern music or art. Both are languages, yet nothing can be said of either that is pertinent to the traditional habits of linguistic sense. When we ask the contemporary artist to explain himself, he refers us back to his work. He is reluctant to translate his efforts into words—that is, into a wholly different medium. Contemporary music also flies from exterior meanings. Language today deals only with surfaces of experience. "The rest," says Steiner, "and it is presumably the much larger part, is silence. The space-time continuum of relativity, the atom structure of all matter, the wave-particle state of energy are no longer accessible through the word. Reality now begins outside verbal language."

Not since Babel have words and thoughts clashed in such protesting combination.

The current situation is complicated even more by the rebirth of ritual which, though its origins are seemingly more ancient than language itself, lay dormant for 2500 years under literacy.

Both preliterate and postliterate ritual are highly involving, and what involves, surrounds. Thus it's not enough to say of x-ray art that it shows both inside and outside of a figure simultaneously. The question is, what does it mean to go right *inside* a form—to be "in the belly of the beast"? I suspect it's something like Alice going through the looking glass, or a Zuni patient stepping into a sand painting, rolling in it, as it were. One enters, becomes one with, what is portrayed. One goes right inside and takes over temporarily. One comes to know a thing by being inside it. You get an inside view. You step into the skin of the beast, and that, of course, is precisely what the masked and costumed dancer does. He puts on the beast.

Much the same may be said of the electronic environment where we are constantly bombarded by light images emanating from the

cathode tube—Joyce's "Charge of the Light Brigade"—playing on us, going inside us, making us all the "Lord of the Flies," engulfed by flickering images.

"People don't actually read newspapers," says McLuhan, "they get into them every morning like a hot bath." The breakfast-reader, like the subway-reader, uses his newspaper as a wrap-around environment: he steps into the news.

Such art is "put on" art. It's the experience of entering a Bridget Riley walk-in, or a Light Happening ("Step right in," begins Allan Kaprow), or a tribal ritual where everyone participates *in* art. "When I am *in* my painting . . . ," said Jackson Pollock.

At most, words play only an integral part of ritual; at times they get in the way. Certainly ritual is not ordered and ruled by words or the grammars of either speech or print.

Artists, poets, children, tribesmen, film-makers find it much easier to accept the term "wordless thinking," when applied to ritual, than do scholars who will admit to two languages only: verbal and mathematical. For them, the analytical mode of thought alone is synonymous with intelligence. They are reluctant, for example, to grant dancers membership in a college faculty. But the knower as observer and the knower as actor behold different worlds and shape them to different ends, and it's senseless to condemn one for failing to meet the standards of the other.

Speech, emerging from ritual, retained much of ritual's multisensory character. In the tribal world, where the eye listens, the ear sees, and all the senses assist each other in concert, speech is a kind of web, a many-layered symphony of the senses, a cinematic flow which includes all of our "five and country senses." Eliot reminds us of this when he says a word can be a poem.

"Writing," says McLuhan, "meant a translation of this many-layered concert into the sense of sight alone. Reading and writing in this respect represent an intense degree of specialization of experience. Writing meant that the acoustic world, with its magic power over the being of things, was arrested and banished to a humble sphere. Writing meant the power of fixing the flux of words and thought. Writing permitted analysis of thought processes which gave rise to the division of knowledge. With writing came the power of visually enclosing not only acoustic space but architectural space.

And before writing all of these divisions were merged into a single knowledge, a single rhythm in which there was no present but all was now."

Yet manuscript culture still retained some of the qualities of oral speech. Nothing was more alien to medievalism than silent reading. Reading was aloud, often as song, with gestures, usually performed while standing. Physicians sometimes prescribed reading as a form of exercise. Carrels were like telephone booths, designed to keep down noise.

Patients who have undergone throat surgery are forbidden to read, for there is a natural tendency for a reader to evoke absent sounds, and his throat muscles work silently as he scans the page.

A child learns to separate senses when he learns, in class, to read silently. His legs twist, he bites his tongue, but by an enormous *tour de force* he learns to fragment his senses, to turn on one at a time and keep the others in neutral. And so he is indoctrinated into that literate world where readers seek silent solitude, concert-goers close their eyes, and gallery guards warn, "Do not touch."

Print accelerated what writing began. The eye was no longer simply primary: with print it became dominant. This visual emphasis was two-fold: the nature of the eye is such that it fragments the field of observation; it favors one-thing-at-a-time; it isolates one element out of that total field and focuses on it, abstracts it out, forcing all else into the subliminal. It shatters the polysyllabic patterns of oral language into minimal, specialized units—into "words," which are essentially visual, spatial units.

There's a second factor: the eye emphasizes observable, measurable material things, and deals with their external surfaces, their outer appearances. The nonmaterial was translated linguistically into the material: such psychological states as tendency, intensity, duration were expressed as spatial metaphor: we said, "I can't *come* to *grips with* your argument, for its *level* is *over my head*, our *views* being so *far apart* my imagination *wanders*," etc.; "thenafter" became "thereafter," etc.

Speech imitated print, and language retreated further from ritual. Step-by-step, language cast off its ritualistic features. It divested itself of all sensory connections, save sight, which it used in a highly

specialized, restricted way: the eye of the marksman; the eye of the man holding a fixed position ("from where I stand"), having a "point of view," reviewing all experience, like Stalin reviewing troops or Milton reviewing life.

As late as the Renaissance, it was still possible to believe that language could enclose within its bounds the sum of human experience, at least human sensate experience. Mathematics was still anchored in material experiences which in turn, were ordered and ruled by language. But with the formulation of analytical geometry, the theory of algebraic functions, and the development of calculus, mathematics ceased to be a dependent notation, an instrument of the empirical, and became an autonomous language, totally untranslatable into speech.

Mathematics allowed man to escape from the spiral of language. "Language," says Steiner, "yields nothing except a further image of itself. It's an elaborate tautology. Unlike numbers, words do not contain within themselves functional operations. Added or divided, they give only other words or approximations of their meanings." Mathematics broke out of this circle.

Beginning about 1900, science shifted away from the empirical to the invisible. The concern, for example, was not with how calcite looked, smelled, or felt, but how it reacted to hydrochloric acid. Buckminster Fuller writes: "In World War I industry suddenly went from the visible to the invisible base, from the track to the trackless, from the wire to the wireless, from visible structuring to invisible structuring in alloys. The big thing about World War I is that man went off the sensorial spectrum forever as the prime criterion of accrediting innovations. . . . All major advances since World War I have been in the infra and the ultrasensorial frequencies of the electromagnetic spectrum. All the important technical affairs of men are invisible. . . ."

Even government has become invisible. We speak of the CIA as the "invisible government." What could be more natural in a society where truth is regarded as invisible, inner structure. In personal terms, the inner trip now supplants outer travel. It's the psychic leap man has been performing in this century. We no longer think of reality as something outside ourselves, something there, to be observed, measured. This concept came with the Greeks, with literacy,

and it goes with literacy, with the coming of the electronic media. Once more, after an interval of 2,500 years of literacy, reality is conceived as being within one, and the search for truth has once more become an inward trip.

Language plays little part in the inward trip. Words get in the way. Silence is regarded as a higher state, beyond the impurities and fragmentation of speech, free of the naive logic and linear conception of time implicit in print.

The application of mathematics in science, coupled with a concern with inner structure, led scientists away from the empirical and hence away from language. Today, chemistry is largely mathematical; genetics, almost wholly so. Increasing areas of biology are being taken over by mathematics. *The Origin of Species* is now regarded as essentially literary. Darwin and his contemporaries were concerned with outer appearances: how turtles *looked.* No wonder it took 35 years for them to understand the significance of Mendel's discovery.

Numbers are used in still another way: as neutral alphabet. Let me give a simple illustration; the first English census was called the Doomsday Book, not because it was used for taxation, but because its entries were visual, not verbal. "John Smith," written, lost many levels of meaning which "John Smith," spoken, retained; and this threatened the sense of identity of many people. When telephone companies dropped the prefix, as in GRanite 71111, and substituted 4771111, many people were resentful, for they found numbers, which didn't evoke an auditory image, more difficult to remember. People often feel a loss of identity when they are designated by number rather than by name; they say, "My name is 'John Smith,' not '47862.'" In this context, numbers aren't used as numbers but as neutral alphabet, totally devoid of all sensory associations.

Art and music, of course, cannot escape the sensate world; both are permanently tied to the senses. But neither is permanently tied to language. We could say of Rembrandt's work: this is a portrait of a man with a golden helmet. "But," says Steiner, "absolutely nothing that can be *said* about a Franz Kline painting will be pertinent to the habits of linguistic sense. A De Kooning canvas has no subject of which one can render a verbal account. It bypasses language and seems to play directly on our nerve ends." Art has ceased

to be *re*-presentational; it no longer strives to create an illusion of being more than itself. It's a *thing*, to be responded to directly.

The same can be said of contemporary music, especially electronic music. Contemporary music isn't background music; it's foreground music: it engages our senses directly and requires our participation.

As we become increasingly tribalized in art and outlook, and draw closer to the Eskimo and Trobriander, anthropologists lose their best tool—the comparative method: its built-in shock, its challenge. My notion is that for the truly alien we must now turn to literature: Tolstoy, Hawthorne, Melville; we must say to students, "This is strange but it's human and it's worth knowing."

History is full of delightful reversals, where the opposite of what one predicts comes true. Where does the Word, where does literacy, survive in this vastly confusing Tower of Babel? My guess is that it may survive among drop-outs. In California, bookstores are feared as subversive centers; the underground press is written by and for drop-outs; the Word, not film, has become the medium of dissent. The hippies have discovered print, something totally new to them, and they are obviously thrilled by it. They discovered it outside their homes and outside their schools. They may not be able to express themselves very clearly as yet, but they have turned to literature—to classics, in fact—and it's possible the whole thing may turn out to be more than a put-on. Certainly print has proven an effective weapon in the hippies' search for identity through protest. Literature may survive as a result of their growing involvement in it. In contrast, the classroom presupposes an audience totally ignorant of all literary traditions: I recently saw a memo from a college textbook editor explaining that Joyce and Pound would have to be identified. We live in a scene where a large percentage of college presidents come from physical education, but drop-outs read Elizabethan verse and Greek drama.

When Constantinople fell, its scholars fled West, carrying their manuscripts with them. To read them, Western scholars had to learn Greek and thus they encountered not only Plato and Aristotle (hitherto known to them only through imperfect Latin translations), but a whole library totally new to them. This library, perhaps more

than anything else, helped harness Renaissance technology to creative human ends.

Today's hippies are much like those fleeing scholars. They've taken the classics and fled from campuses which have fallen to weapon development, the CIA, and schools of social work. The notion that anything might come from this must appear, to school authorities, as wildly preposterous as the notion, to the conquering Muslims, that ragged monks with battered manuscripts were escaping with Constantinople's real treasures.

Edmund Carpenter's article has been reprinted from the March 1970 number of *ETC.: A Review of General Semantics* with the kind permission of the International Society for General Semantics, P.O. Box 2469, San Francisco, Calif. 94126. Professor Carpenter is a member of the Communication Arts Department, Fordham University, New York City.

Comment: The Role of Script in Describing the Languages of the World

John Lotz

A program for describing the world's languages deals to an overwhelming extent with spoken languages. If, however, we intend to cover the entire scope of natural languages, we have to include other symbolic systems as well. By natural language we mean a symbolic system which can generate topically unlimited discourse. Its characteristics are: a large set of basic signs (morphemes) which can be changed and expanded; the formation of sentences by intricate hierarchic syntactic rules out of these morphemes; the formation of discourse by a loose repetition of such sentence structures; and non-limited semantic coverage correlated with this formal arrangement. Such symbolic systems can produce an unlimited number of discourse events, can cover any known situation, and are capable of being remodeled. Natural languages, so defined, may use visual transmission as the characteristic of communication, such as in sign languages. And, more importantly, in some languages, the spoken language co-occurs with written language. For these languages script is a normal and natural means of communication.

In societies where script is used, it is a significant and normal medium of expression. For older stages of languages and for extinct languages, script is the only source of language information, where the phonological aspect has to be inferred and is less well understood. But even in modern societies, script represents major social, political, and cultural forces (the choice of the kind of alphabet, e.g., Cyrillic for minor languages in the Soviet Union and Latin script in other parts of the world; the change from one type of script to another, e.g., introduction of Latin script for Turkish in the 1920s; the use of different kinds of script, such as Latin and Cyrillic for

SYMBOLS

- graphic system
- phonological system
- morphemic (formal) sign
- semantic reference
- the basic constitutive relation in language
- relation from morphemic units to expressive media
- graphic elements in relation to other elements

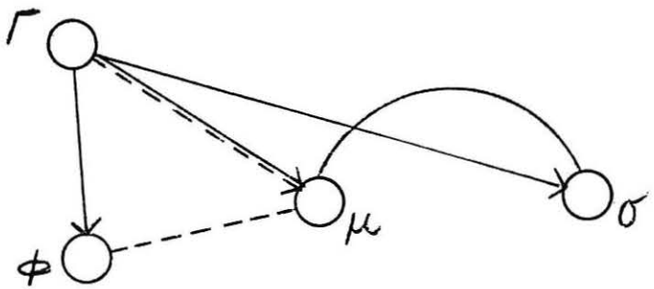


Figure 1. Language Model with Built-in Script Component.

Serbo-Croatian; etc.). For languages where script is used, the spoken language alone can hardly be regarded as the full representation of the language, e.g., spoken Japanese is hardly a sufficient and self-contained modality of Japanese.

Linguistic theories on the whole have not dealt adequately with this problem of script. In American structuralist tradition, script was "out-defined" by postulating that writing is not language (this results in the consequence that the journal of the Linguistic Society of America, *Language*, is not in English). In various European structuralist traditions script was touched upon unsystematically and

mostly with reference to stylistic characteristics of written language. Glossematics did allow the linguistic form to appear in various substances, including speech and script; these, however, were never investigated, nor was their relationship to each other clarified. In many traditional grammars a chapter on script was loosely inserted, but without integrating it in the total grammatical framework. Books which deal with script in general—such as the works of Jensen or Gelb—put the emphasis on script itself, and its relationship to the total context of language is less of a concern.

Certain general comments on the role of script can be made:
1) Script should be treated in its own terms and cannot be derived entirely from speech, since script contains elements which are not present in speech, such as capitals, abbreviations, hyphenated forms in modern languages and determiners in Old Egyptian hieroglyphs. It is equally true that certain features of speech are not represented in script and, therefore, script is not sufficient to substitute for a phonological description either. It is interesting to note that script seems to be closer to "underlying" morphological forms than the phonological representation.
2) In the total framework of language, script has to be established in three relationships: the relationship of script to the semantic coverage; the relationship of script to the morphemic units; and the relationship of script to speech.

The units in script with relation to sound can either be references to single phonological elements, such as Finnish *m* corresponds to the sound /m/; or to complex phonological segments, such as Greek *ψ* corresponds to the cluster */ps/*; or to syllable-like segments, such as Japanese フ corresponds to */fu/*. Sometimes graphic elements correspond to prosodic features, such as in Hungarian the accent on *á* corresponds to the prosodic feature of length. One can even go further and claim that the umlaut-sign on the German vowels *a*, *o*, *u* corresponds to a raised second formant contrasting them with the back vowels.

Units of script referring to morphemes appear wholesale in logographic scripts, such as in Chinese. In our script system the numbers or the & do not correspond to any sound; they refer globally to the morpheme.

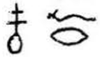
Graphic Symbol	Phonological Reference	Morphemic Reference	Semantic Reference	Phonological Correspondence
Finnish	/m/	–	–	/m/
Greek 	/ps/	–	–	/ps/
Japanese 	/fu/	–	–	/fu/
English &	–	[and]	–	/and/
Egyptian hieroglyph 	/fu/  /r/ 	[n.f.r]	–	/nefer/
Egyptian hieroglyph 	–	[p.r]	–	/per/
Egyptian hieroglyph 	–	[p.r]	'Category of going'	/per/
Hungarian ?	/Different intonation patterns/	[Sentence qualifier	'Question'	/Different intonation patterns/

Figure 2. Chart of Graphic References.

Elements of script referring to the meaning directly occur in the determiners which are common in Old Egyptian hieroglyphs or in Sumerian cuneiform, e.g., in  the upper sign refers to the pronunciation /p.r/ and the lower part , the legs, to the semantic feature of going.

Sometimes the relationship is complex, e.g., the interrogation sign ? in Hungarian indicates that the sentence is not assertive, but questioning. It can be regarded as a global morpheme, and it also corresponds to certain intonation patterns in speech.

3) Though script and speech have to be treated as separate systems for adequate description, there are certain features in the relationship between the two which are not simply juxtapositional.

It is customary to regard speech as the only normal medium of language and view script as secondary. This approach is especially prevalent in American structural linguistics, but such views occur already in Aristotle's thinking about language in his formulation which establishes the chain: psychological content→speech→script.

Ἔστι μὲν οὖν τὰ ἐν τῇ φωνῇ τῶν ἐν τῇ ψυχῇ παθημάτων σύμβολα, καὶ τὰ γραφόμενα τῶν ἐν τῇ φωνῇ.

(*De Interpretatione*, Loeb; p. 114. Note the term *grapheme*.)

The arguments advanced to motivate such a position are of two kinds: (a) of genetic nature and (b) of generality. (a) The genetic arguments can be *ontogenetic*, i.e., the individual in his life span learns to speak first and writing is acquired later; *phylogenetic*, i.e., in the history of any social group, or mankind in general, speech developed first and script came later; or *psychogenetic*, i.e., it is claimed that in each reading or writing event there is a mediation through the underlying spoken language. (b) The arguments with reference to generality are of three kinds: *literacy*, i.e., there are no communities without a spoken language, whereas there are many communities which have no writing system; *educational*, i.e., even in communities where writing exists, not all adults are literate; and *generational*, i.e., children speak before they learn to write.

It seems clear that the genetic arguments are inconsistent with the general procedure which is followed in the structural analysis of speech. Also, the arguments of generality, valid as they may be, do not give any systematic and concrete analysis of script. There are

elements in the writing system, such as capitals, which have no correspondence in the spoken language and vice versa. Therefore, we follow the procedure to describe both media by themselves and then state the correlation between them.

It must be noted, however, that speech has basic *inherent* characteristics—which gives speech the pivotal unmarked position among the media in language communication, including script. The *unidirectedness* of language communication is inherent in speech, present both in articulation (where it is characterized by a three-dimensional configurative variation of the vocal tract) and in the acoustic sphere (where it is characterized by a limited pressure variation in a single dimension of oscillation), and organized along a single time dimension. In script there is no internal reason to choose this restricted linear way of communicating, since here instead of linear sequences (actually a narrow ribbon) the surfaces could be utilized. (This was actually the case in pictographic writings which were forerunners of the hieroglyphs in Egyptian.) Moreover in speech the distribution of sounds along the syntagmatic axis has its internal motivation, the syllabic opening-closing of the vocal tract; no such motivation exists for the distribution of letters in writing. Also, the background of speech is the atmosphere, briefly restructured by a low energy vibratory impact of the vocal tract, whereas writing presupposes a material background (a piece of paper, a slab of stone) and requires additional tools and materials. (Speech must be, therefore, viewed as the basic medium of communication for human language.)

John Lotz is director of the Center for Applied Linguistics (1717 Massachusetts Avenue, N.W., Washington, D.C. 20036). Previously he had been a professor of linguistics at Columbia University. Dr. Lotz has recently completed a Hungarian Reference Grammar, and he lectures widely on linguistic subjects.

A Plan for the Systematic Treatment of Script (table of contents of the chapter on script in *Hungarian Reference Grammar*).

I. Structure of Script
   - A. Graphic Inventory
     1. Signal Constituents
        - a. Letters
        - b. Global Signs
     2. Punctuation Marks
   - B. Signal Formation
     1. The Graphic Word
        - a. Simple Words, Compounds, Hyphenated Complexes
        - b. Use of Capital Letters
        - c. Abbreviations
        - d. Mechanical Cuts (hyphenation)
     2. Text Formation
        - a. Sentence Formation
        - b. Higher Units (paragraph, chapter, etc.)
        - c. Mechanical Arrangements (page, etc.)

II. Pragmatics of Script
   - A. Handwriting and Typing/Printing
   - B. Emotional Features (italics, capitalization)
   - C. Style of Letters

This article is excerpted from a presentation given by Dr. Lotz at the Burg Wartenstein Symposium No. 49, "Toward the Description of the Languages of the World," held last August in Austria. This paper contains extensive analyses of three concrete examples: Hungarian Script (above is the table of contents of this chapter in his *Hungarian Reference Grammar*); the correlation between script and speech in the complex Hungarian Imperative (*American Studies in Uralic Linguistics*, Indiana University Publications, Uralic and Altaic Series, Vol. 1, 1960, pp. 83–92); the conversion of script to speech as applied to Hungarian (*Linguistic Reporter*, Vol. 11, Number 5, October 1959, Supplement No. 23, pp. 17–30).

Correspondence

The editors welcome comments on articles, reviews, and letters that have appeared in past numbers. Communications should be addressed to the Editor, c/o The Cleveland Museum of Art, Cleveland, Ohio, USA 44106.

To the Editor:

In the interest of some sort of correct history and some understanding of the subject that is a little nearer to the truth, I should like to take issue with Gerrit Noordzij as he has expressed himself in the article, "Broken Scripts and the Classification of Typefaces" (*The Journal of Typographic Research*, Summer 1970, pp. 213–240). Even to the average reader it must be clear that the article falls into two almost completely unrelated parts—which, of course, the title indicates. It would be best, perhaps, to direct my remarks to each of these parts separately; although they do become somewhat intertwined.

As Mr. Noordzij tells us at the outset, the "cause" was a little book compiled by Walter Plata, *Schätze der Typographie Gebrochene Schriften*. This booklet should have been explained to the reader. It grew out of a series of articles that Mr. Plata had written for the printing-trade publication, *Der Polygraph*. These articles, together with letters and statements by seventeen other individuals—most of them well-known in the typographic or publishing fields—were issued in this pamphlet of 96 pages by the Polygraph Verlag. I would doubt very much that many of the readers of *The Journal of Typographic Research* have seen this publication; still fewer have read it. This enables Noordzij to use it as a whipping boy to try to persuade Journal readers to his point of view.

One must object first to the statement, "The contributors differ in their evaluation of broken type, but they *agree* in the presumption that broken type should be German heritage and that it could be regarded as opposed to roman type according to the German classification DIN 16 518." This is an enormous presumption and misrepresentation on the part of the writer. I would say, having read the pamphlet in question carefully, that no two of the contributors agree—I think particularly of Richard von Sichowsky and Hermann Zapf. The latter, by the way, has long since put forward a notion of type classification of his own.

At about this point Noordzij hurriedly leaves the discussion; firing two blasts at the Germans in the way of quotations from S. H. Steinberg's, *Five*

Hundred Years of Printing, and Jan van Krimpen's, *On Designing and Devising Type*. As far as the late Mr. Steinberg is concerned in respect to Textura, Schwabacher, and Fraktur types, I think a quote from the same book will finish the matter for most readers. On page 36 of the Pelican paper-back edition is the statement: "But Schwabacher, although more rounded and open than Fraktur, is on the whole so little distinguished from Fraktur that it cannot actually be considered an independent second face." Any man who can say that doesn't really know much about type nor letters; I don't think he is believable as a reinforcement to our writer's peculiar argument. The quotation from Jan van Krimpen is also a strange one to use in that it distinctly pushes the Germans into the area of "Gothic and its several derivatives." At this juncture the whole of Noordzij's reasoning spins into complete confusion; he seems to realize the questionable use of his quotations and, reversing his field, charges against the quotes themselves.

In all of this there is to be detected a Germanophobia that is at once sad and unscholarly. Walter Plata's little compilation should certainly not produce the virulence that is evident in this discussion; it was meant entirely for German consumption and was done rather in a spirit of professional concern and exploration than with any desire for nationalistic insistence, such as Noordzij keeps looking under the bed for. If anyone is at fault in flaunting nationalism, it is he. The tub-thumping against the Germans continues after he has introduced the second item of the article, the classification of typefaces—he can't seem to stay away from it. For instance, he wants to know how "Germany came to its annexation of French and Italian hands"; here the nationalistic note is introduced concerning developments that took place when Europe was on a more or less international basis and the scholarly language was Latin.

The discussion turns to criticism of the typefaces that were shown in the Plata pamphlet and a comparison with the types that may be seen in the famous Enschedé specimen book of 1908, *Fonderies de caractères*, etc. The implication is that Plata neglected these sixteenth-, seventeenth-, and eighteenth-century types purposely when he noted the availability of the various Textura, Schwabacher, and Fraktur faces in the German market. The only question I can see is that of just how foolish Noordzij can become. One could go on and on citing the nonsensical positions he takes and defends with dogmatic deadliness. One could almost be convinced that the birth of the printer's art had never happened in the German area during the latter half of the fifteenth century; and even if one did get such notions nothing has taken place there since. Otto Hupp, Emil Rudolf Weiss, Walter Tiemann, Rudolf Koch, Fritz Helmut Ehmcke, F. H. Ernst Schneidler, George Trump, Herbert Post, Hermann Zapf, and others do

not exist for Noordzij; even though he reproduces the Zapf page from the Plata book. He would have us believe that Jan van den Velde did more for the Fraktur in the early seventeenth century than the printers and scribes in the German area did in developing the type in the early sixteenth century. I would strongly urge him to restudy his typographic history and to step down at once from his own little nationalistic bandwagon.

Actually, the second part of the article falls again into two sections. The section concerning writing has great interest in that it explains for the lay readers some of the technical means of producing written letters; which, as most people know, preceded type. Of course, type is simply an extension of writing, of the written letter. All this is brought forth clearly enough; although I cannot agree that the written letter alone is the basis for typographic designs or reading symbols. Not that I do not believe in the practice of writing as the foundation for understanding the letter and the page just as fervently as does Noordzij; it is refreshing to see this position maintained. But it is obvious that type was influenced by the methods of manufacture from the very beginning; the other influences: writing, engraving, lithography, etc., also have their place, whether one agrees or not. As a matter of fact, the photographic processes are already having their effect on letter forms and their use, a good part of this effect being somewhat undigested up to the moment.

The section on writing bears strongly on Noordzij's system of type classification. It is just another system; there have been many of them. Certainly most of them are fatuous, including the DIN 16 518. What is illustrated of that system in the article is fairly unfortunate; I have a much better discussion of it before me, prepared by Willi Mengel, *Druckschriften der Gegenwart*. Noordzij indicates that no system will encompass the entire typographic complex; I would agree. His particular notion of *translation* and *expansion* is ingenious but hardly workable for the non-writer. The cursive and interrupted letters are also not the key to typographic design; although they make for a great part of the stylistic validity of an alphabet. I daresay that Noordzij is a good teacher of writing and lettering at the Royal Academy in the Hague; what he lectures about at the Plantin Institute is not known to me; I would only hope that it is not history.

Alexander Nesbitt
Southeastern Massachusetts University
North Dartmouth, Mass. 02747

Editor's note: see also Walter Tracy's article, "Type Design Classification," beginning on page 59, which follows Gerrit Noordzij's article.

A Reply to Alexander Nesbitt:

It would be much too difficult to reply without disturbing Mr. Nesbitt's illusion that there could exist something like "correct history." History is not a rock of truth, but the art of selecting facts for a systematic arrangement which is relevant for our present concern. According to this relevance, facts are neglected, accentuated; in short, violated.

The construction of scripts is my lever of facts. Its impact could be demonstrated in Updike's well-known passage on Bodoni.[1] Updike deplores the change in Bodoni's style of type design, which made his typography as cold as the nearby Alps. This "decay" is ascribed to the spirit of the time (which explains nothing). And for Updike, Benjamin Franklin's letter to Bodoni[2] is merely allusive to Bodoni's social position; its contents seem to be meaningless for him.

1. "But while it was in his first period that he produced his most beautiful books, he himself did not think so. It may be said that this is self-evident, because he soon changed his style for one which he must have considered an improvement. But it was not Bodoni, but the spirit of the art round about him, that made his later types more and more rigid, their heavy lines thicker, and their light lines thinner and more wiry. Wonderfully perfect as these types were in detail, they contributed to a style of printing that made these later books as official as a coronation, and as cold as the neighbouring Alps! His volumes were to other printing what Canova's statuary was to earlier sculpture." D. B. Updike, *Printing Types: Their History, Forms, and Use*, Vol. II (Cambridge: Harvard University Press, 1922), 174.

2. ". . . Franklin wrote the following letter to Bodoni, dated Philadelphia, October 14, 1787: 'I have had the very great pleasure of receiving and perusing your excellent *Essai des Charactères* [sic] *de l' Imprimerie*. It is one of the most beautiful that Art has hitherto produc'd. I should be glad to see a specimen of your other Founts besides this Italic & Roman of the Letter to the Marq^{s}. de Cubieres; and to be inform'd of the price of each kind.—I do not presume to criticize your Italic Capitals; they are generally perfect: I would only beg leave to say, that to me the form of the *T* in the word *LETTRE* of the Title Page seems preferable to that of the *T* in the word *Typographie* in the next Page, as the downward stroke of *T, P, R, F, B, D, H, K, L, I*, and some others, which in writing we begin at the top, naturally swells as the pen descends; and it is only in the *A* and the *M* and *N* that those strokes are fine, because the pen begins them at the bottom.' De Lama says that Bodoni was overcome with joy to have from the President of the United States of America this flattering letter, which he considered a title to glory and preserved with religious care. Bodoni and De Lama, although a little mixed about the office which Franklin held in America, were quite right in being pleased; and this compliment so flattered Ferdinand, Duke of Parma, that he had the letter translated into Spanish, and sent it to his uncle, Carlos III, at Madrid, to whom Bodoni was honorary printer by appointment." Ibid., pp. 167–68.

For me the clue is in Bodoni's statement that the best typography resembles good handwriting (*Manuale Typografico*). In this respect Bodoni's last style is not only an improvement, it is almost perfect: the *Manuale* could be used as a copybook. Franklin disapproves swell (expansion) which does not conform to swell in handwriting. The letter confirms my view on type design, whereas anecdotes on Parmesan Dukes and Spanish kings become small talk.

Nesbitt calls my proposed binary classification system unworkable for the nonwriter. This is not in contradiction with my, "Such a classification is easy to handle for anyone who has a basic knowledge of writing." But by turning my statement into a negative sentence, Nesbitt might suggest that the "non-writer" is able to understand typography. If this is his purpose, he should send me such a non-writer with the slightest understanding of Bodoni, of Baskerville, of italic, of grotesque, of fraktur—of typography.

Where should I restudy typographic history? With Steinberg, who saw no difference between fraktur and schwabacher? With Updike, who called the consistent Baskerville an eclectic? Or with Morison, who believed that type design gradually moved from handwriting to Bodoni's rationalism? With all regards to these authors who supplied us with material of greater value than they often realized themselves (e.g., the Franklin letter)—their history is an enormous complex of deception. Progress in understanding, which was the concern of these learned men, is not achieved by canonizing their conclusions, but by criticism; to restudy history means to rewrite history.

The current systems of classification of type can only be understood by people who do not need them anymore. In this sense my proposal is not just another system; it is a system which is effective as an *introduction* to type design.

My "foolish" and "nonsensical positions" are consequences of my notion on construction which Nesbitt kindly calls "ingenious"; I wrote of fraktur as a cursive script, and the designers listed by Nesbitt—though I admit their existence—did nothing in this field. Consciousness of cursive and interrupted writing is the key to understanding the difference between fraktur and textura, in spite of Nesbitt's gratuitous denial. In this sense Zapf's Gilgengart is a fraktur and Schneidler's Zentenar is a bastard. My preference for Zentenar is not relevant for the present subject.

Now to Nesbitt's small objections:

The quotations of Steinberg and Van Krimpen have been chosen to show that the identification of broken script and German script as opposed to "Latin script" may lead to tremendous absurdities. Nevertheless this identification is the starting point of the discussion in Plata's book. When Zapf rejects broken scripts because he rejects nationalistic typography and when Von Sichowsky hesitates to use broken scripts for the same reason, acceptance of this starting point is implicated.

Where did Nesbitt find the interesting information that Plata "purposely" restricted his compilation of available type to type made in Germany, and for such a questionable reason omitted the only good available textura fonts, nevertheless including a list of typefaces from Monotype Corporation Limited?

Walter Plata says that a long period of decay in German type design ended about 1800. This is not in contradiction with my recording the superiority of fraktur in Dutch and English copybooks of the seventeenth century to its German *contemporaries*. It was, moreover, only a casual remark in a passage which pointed out that fraktur is as good for other languages as for German.

"He would have us believe that Jan van den Velde did more for fraktur in the seventeenth century than the German scribes and printers did for its development in the early sixteenth century." Nesbitt has the pretention to come still "nearer to the truth" than I already did. I wonder if he will reach his goal with the quoted imputation. Please read again the last sentence on page 221 of my article. I never said that Van den Velde equalled Andreä.

In detecting my Germanophobia, Nesbitt plays a very scholarly joke. I might try to surpass him with the qualification in parentheses after my name.

Gerrit Noordzij
(Corresponding member, Bund Deutscher Buchkünstler)
Langstraat 11, Tuil (Haaften), Holland

To the Editor:

The discussion now going on in *The Journal of Typographic Research* [beginning in the July 1969 number: "O or 0?" by Dirk Wendt, pp. 241–48; and "A Proposed Fontstyle for the Graphic Representation of the Oh and Zero" by Allen G. Vartabedian, pp. 249–58; and subsequently, a letter from Hermann Zapf with a reply by Mr. Vartabedian in the Spring 1970 number, pp. 179–183] serves to illustrate the problems that arise in designing alphabetic and numeric symbols that have many and varied applications and methods of making. Since letterforms evolved into abstract symbols, their meaning has to be known and uniformly applied in order to communicate.

The problem of distinguishing the letter Oh from the numeral zero is now accentuated because computer programmers have rediscovered it. In solving the problem for their immediate application we should be very cautious not to introduce more problems than solutions. The real need to clearly differentiate becomes more obvious day after day as our society tends to find new and more ways to apply numerics to our contemporary needs to communicate. The tabulating demands have already affected the zero, causing it to be made narrower in order to effect a common width. The common height is also more widely used now than oldstyle.

The failure of the slash or diagonal through the zero is due to the many varied meanings applied. Context often is not enough to distinguish whether zero, diameter, canceled zero, oh, or empty set is meant.

Without attempting to finalize it, I do believe that the complexities of languages with their diacritics and the many ways in which they are depicted makes the proposal of Hermann Zapf to change the zero a more logical step than the proposal of A. Vartabedian to change the letter oh. The objection to Zapf's suggested change looking like the Greek letter sigma could be overcome by starting with a short horizontal stroke rather than finishing with it (Fig. 1). Another way a difference can be made in a thick-and-thin design is what Jan Tschichold did with Sabon in which the thick-thin relationship of the oldstyle zero is turned 90° and appears as a traditional zero lying on its side (Fig. 2). Using this solution, however, would leave the problem of how to distinguish the monotone sans-serif characters, so I tend to favor the first proposal which is adaptable to more methods of making and would apply to both monotone and thick-thin. The computer output is only one of the many ways in which we make letters and numerals.

Handwriting, rubber stamps, typewriter, printing, and all the other ways of making these symbols visible should be given careful study before any changes are made permanent. Perhaps the educators of elementary

school children will have something to contribute. At least they should be consulted. Personally, I believe that concern for human problems, even those of alphabetic communication, should receive primary consideration. Solutions to machine problems should assist if possible, but at least they should not aggravate the many problems of alphabetic communication. The ophthalmologists have enough work, and educators, I'm sure, could use any available time to better advantage.

John A. Schappler, Director
Department of Typeface Design
Ludlow Typograph Company
2032 Clybourn Avenue, Chicago, Illinois 60614

ABCDEFGHIJKLMNO
uvwxyz1234567890

Figure 1.

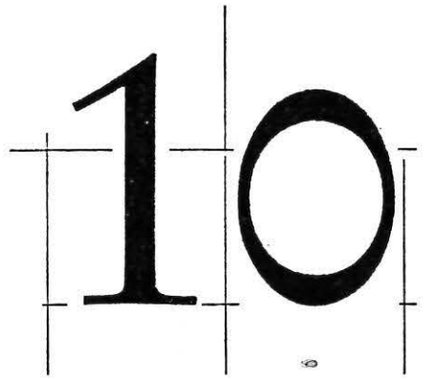


Figure 2.

The Authors

A. S. Osley (The Glade, Brook Road, Wormley, Godalming, Surrey, England) is an administrative civil servant by profession. He has been editor of *The Journal of the Society for Italic Handwriting* since 1961. Dr. Osley's principal publications are *Calligraphy & Palaeography* (a festschrift for Alfred Fairbank), 1965; *Cresci's Essemplare*, 1958; *Mercator*, 1969.

Rudi Bass is director of graphic arts for CBS News (524 West 57th Street, New York City 10019). He has been an art director for *The New York Times* and two advertising agencies: McCann Erickson, and Batten, Barton, Durstine & Osborn. His life-long concern for type and its relation to other visual elements dates back to the Vienna Kunstgewerbeschule and early studies of Swiss typography.

Marjorie Crofts (Caixa Postal 129, Porto Velho, Roudonia, Brazil) has a background in nursing, religion, and linguistics. Working with the Wycliffe Bible Translators, she first went to the Amazon Valley in 1960 as part of an adult literacy program, and has concentrated since on the Mundurukú Indian language.

Walter Tracy for 22 years has been in charge of typeface development at the British Linotype Company (25 St. Pancras Way, London NW1, England). He has designed newspaper types—Linotype Modern most recently—and has commissioned and supervised a variety of Arabic and other non-roman type designs.

This number of *Visible Language* has been composed in Monotype Baskerville types and produced by W. & J. Mackay & Company Ltd., of Chatham, England, on Bowater B20 Cartridge, Double Royal 84½ lb. The layout is based on the original design by Jack Stauffacher of the Greenwood Press, San Francisco.

RE: THE BRITISH POSTAL STRIKE. "We did discover (with explorations) that readers did like a journal that appears on an irregular basis. Most readers of most journals are very unhappy about their regular appearance." Marshall McLuhan in a dialogue with E. A. Stearn. *McLuhan Hot & Cool*, 1968.

Résumé des Articles

Traduction: Fernand Baudin

La calligraphie au service de la cartographie *par A. S. Osley*

Une étude calligraphique, au sens de l'auteur, déborde les questions de style d'écriture et de matériel utilisé. Elle tend à isoler les caractéristiques essentielles d'une écriture donnée et le degré d'habilité atteint par le calligraphe. L'auteur compare des exemples empruntés à diverses périodes de la carrière typographique de Gérard Mercator. Notamment une carte récemment retrouvée et qui, à l'examen, a pu être attribuée à Mercator. Il fait ressortir l'intérêt d'une étude calligraphique dans les questions d'attribution.

L'élaboration du Vidifont *par Rudi Bass*

Le journal télévisé requiert des caractères qui ne sont pas liés à la composition manuelle ou photographique. Vidifont est l'adaptation pour le petit écran du CBS News 36 qui fut lui-même spécialement créé pour la TV: (1) l'oeil, l'approche et la chasse ont été adaptés, et (2) une grille unique a été établie pour harmoniser les ovales et les angles. L'article et les illustrations retracent l'élaboration du Vidifont. Il est également question de l'esthétique des caractères à l'usage du petit écran.

L'invention d'une orthographe Mundurukú, *par Marjorie Crofts*

Le Mundurukú est une langue Tupi en usage dans une tribu indienne de l'Amazonie. Il n'avait jusqu'ici aucune forme écrite. L'auteur montre les difficultés pratiques rencontrées au cours de l'élaboration d'un alphabet destiné non seulement à reproduire la langue parlée, mais aussi à relier au portugais la langue brésilienne. Par exemple: fallait-il représenter tous les phonèmes? Se présentèrent aussi des questions fondamentales telles que de savoir ce qui constitue un mot, une phrase. Les illustrations montrent des textes imprimés en Mundurukú.

La classification des caractères, *par Walter Tracy*

Comme suite à l'article de Gerrit Noordzij (*The Journal of Typographic Research*, IV, Summer 1970, pp. 213–40) au sujet de la classification des caractères, l'auteur passe en revue les classifications française et anglaise et souligne que les trois systèmes ont en fait une structure commune en dépit des différences de terminologie. Il espère que la classification anglaise sera adoptée aux U.S.A.

Kurzfassung der Beiträge

Übersetzung: Dirk Wendt

Kalligraphie — eine Hilfe der Kartographie? *von A. S. Osley*

Kalligraphische Analysen gehen über die allgemeinen Schreibstile und Schreibmaterialien hinaus; sie versuchen, die charakteristischen Züge der Schrift und des Arbeitsstils des Schreibers herauszufinden. Beispiele aus verschiedenen Perioden der kartographischen Arbeit Gerard Mercators werden untersucht und verglichen, einschließlich einer kürzlich entdeckten Karte, die nach kalligraphischer Analyse als Werk Mercators identifiziert werden konnte. Die Bedeutung ger kalligraphischen Analyse zur Bestimmung kartographischer Zuordnungen wird diskutiert.

Die Entwicklung der Vidifont *von Rudi Bass*

Nachrichtensendungen im Fernsehen erfordern alphanumerische Sätze, die nicht im Handsatz oder photographisch vorbereitet sind. Vidifont, eine synthetische Fernseh-Version des CBS-News-36-Alphabets, wurde speziell für Fernseh-Bedürfnisse entworfen: (1) proportional-breite und proportional spationierte Buchstabenformen, die leicht zu lesen sind und maximal den Platz ausnutzen, und (2) eine besondere Gitterstruktur, um ovale Buchstabenkurven und Schrägstriche wiederzugeben. Die Entwicklung der Vidifont wird dargelegt und demonstriert; ästhetische Gesichtspunkte im elektronischen Schriftentwurf werden diskutiert.

Aufbau einer Orthographie für Mundurukú *von Marjorie Crofts*

Mundurukú, eine Tupi-Sprache eines Indianerstammes im Amazonas-Becken besitzt keine geschriebene Form. Dieser Aufsatz beschreibt das praktische Problem, ein Alphabet aufzustellen, das der gesprochenen Sprache ebenso angemessen ist wie dem Portugisischen, der Sprache Brasiliens; z.B. ob man alle Phoneme repräsentieren soll oder nicht, und Grundfragen darüber, was ein Wort oder was einen darstellt. Drucksachen in Mundurukú werden gezeitg.

Klassifikation von Schriftentwürfen *von Walter Tracy*

Im Anschluß an den Artikel von Gerrit Noordzij (*The Journal of Typographic Research*, IV (Summer 1970), 213–40), der die deutsche Schriftklassifizierung analysierte, werden hier die französische und britische Klassifikation vorgestellt. Es wird gezeigt, daß alle drei Schemata die gleiche Struktur haben, obwohl die Nomenklatur verschieden ist. Es wird die Hoffnung ausgesprochen, daß die britische Klassifikation auch in den Vereinigten Staaten akzeptiert werden möge.

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