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Index
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Some Psycholinguistic Components of Initial Standard Literacy

John Mountford

Literacy is a linguistic term predicated of individuals. It means ability to use language in the medium of writing. Standard literacy is the particular kind of literacy required by educational systems, viz. literacy in a standard language. Initial standard literacy is a more adequate term for what is commonly called the teaching of reading. Five psycholinguistic components are suggested: knowledge of a standard language; knowledge of its standard orthography (distinguished from other kinds of writing-systems); 'technical concepts' of literacy; 'habitudes' of literacy; basic skills of literacy (reading and writing). Literacy is also predicated of societies. The study of it, both as a psycholinguistic phenomenon and as a sociolinguistic phenomenon has been neglected in linguistics generally, just as the concept of literacy has been neglected in educational theory.

Literacy is the ability to use language in the medium of writing. This ability is apparently a universal human potential. The assumption that it is so underlies all modern national education systems.

In the way in which the term "literate" will be used in this paper, a human individual must be either literate or non-literate. On a scale of literacy, "non-literate" indicates zero-literacy, "literate" indicates any degree of literacy above zero (see Fig. 1).

Literacy is essentially a linguistic concept. To be literate a person must have (a) some control of language, and (b) some control of the language medium of writing.

Writing can be classed with speech as a normal medium of language, in contrast to abnormal media such as lip-reading or tactile media. But writing differs from speech in that it is not learnt spontaneously. A human being is born with a capacity for acquiring language spontaneously in the medium of speech. Language cannot, it seems, on general evidence, be acquired spontaneously in the medium of writing; nor can control of language in the medium of speech be extended spontaneously to the medium of writing. We have

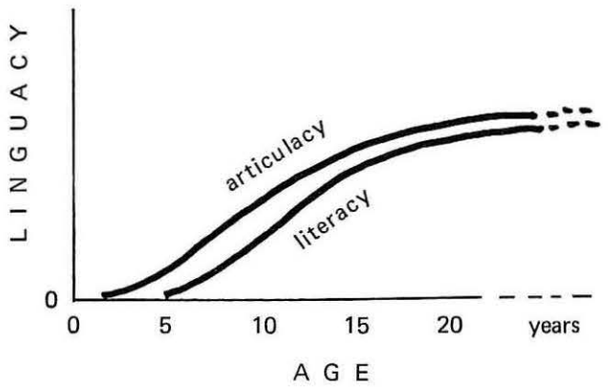

Figure 1. To illustrate "Literacy scale."

to be taught to read. Formal education begins with initiation into literacy.

The situation may be expressed in general terms as follows. A human being is born with a faculty of language which enables him in normal psychological and sociological circumstances to become "linguate"; he is born with a capacity for "linguacy." In normal circumstances initial linguacy takes the form of spontaneously acquired articulacy (ability to use language in the medium of speech); once articulacy has been acquired, then, in circumstances which the world increasingly regards as normal, linguacy may be extended non-spontaneously, by instruction, to literacy (ability to use language in the medium of writing). Abnormally, literacy may be acquired without antecedent articulacy; but we shall confine ourselves to normal literacy.

In normal literacy acquisition, the literacy scale remains at zero until initial mastery in articulacy is attained—the "take-off" point when a baby is said to be able to talk. Literacy then begins, under instruction, to rise from zero towards its own take-off point at which a child is said to be able to read. Instruction does not cease then, but the period of initial literacy learning is over. Both scales, articulacy and literacy, continue to rise in the normal life curve, and presumably tend to flatten in maturity and to decline in old age. The normal literate is a person whose total linguacy is a literate linguacy. This has

important consequences for his use of language in both media, for his concept of language itself, and for the dependent linguistic concepts which he forms. Though we separate articulacy and literacy in analysis, the two are intimately associated aspects of a person's total linguacy.

There are three important differences between articulacy acquisition and literacy acquisition. The first and chief one is that articulacy acquisition is also initial linguacy acquisition; it is the vital once-for-all move from non-linguacy to linguacy, taking place in the medium of speech. Literacy acquisition is only an extension of linguacy. Secondly, articulacy acquisition is spontaneous, literacy acquisition non-spontaneous, as we have said. Thirdly, by definition, articulacy is linguacy exercised in the medium of speech; literacy is linguacy exercised in the medium of writing.

Expressing the situation in such general terms has certain advantages. In the first place, it will be seen that nothing has been said about language in particular. The language or languages in which articulacy and literacy are exercised may be the same or different, and this applies to the initial stages: the language in which literacy is acquired may be a different language from the one in which articulacy was acquired. In fact, in the world today, as in the past, the language of literacy is often not the speaker's first language. But as far as literacy is concerned, it is the medium—writing—which matters, not the language. In this respect, articulacy and literacy are parallel. Second-language learning is not the same as first-language learning. In learning to speak a second language we are not acquiring articulacy over again, but extending our existing articulacy. As literates in our first language of literacy we are not, in learning to read a second language, acquiring literacy over again, but extending our existing literacy. To resort to general terms again, linguacy once acquired in an L1 (first language) can be extended along two dimensions. One dimension is that of "lingualism": we can become bilingual or multilingual, acquiring an indefinite number of L2s. The other dimension is that of language-medium: we can extend our control of language into the medium of writing, and become literate. The two dimensions of extension are independent of each other—though it is worth noting that literates like ourselves think instinctively of a bilingualism which includes bi-literacy.

In the second place, while nothing has been said about languages in particular, nothing has been said about the sociological status of languages in particular either. Literacy is literacy whether it is acquired in a language with a long tradition of literacy or in one with no tradition of literacy, for which the missionary-linguist's texts constitute the whole literature. The native speaker who has learnt to read his language in such circumstances does not have to become literate all over again if he then learns to read a language of wider communication. Literacy is acquired once-for-all, like linguacy itself. Urdu is a minority language in Britain; but that does not make immigrant children who are literate in Urdu non-literates.

In the third place, a point similar to the one just made about language can be made about writing. The presence of language (*langage*) implies the presence of at least one particular manifestation of language, one particular language (*langue*). The presence of writing implies the presence of at least one particular manifestation of writing, one writing-system. The identity of the language or of the writing-system is immaterial. One language is as good as another, one writing-system is as good as another, to establish literacy. But though language (particular) and writing-system are both variables, they are not parallel variables: writing-system (as the term will be used in this paper) is a sub-variable within the variable of particular language. The reason for this is as follows.

Any language may have an indefinite number of writing-systems. English is especially rich in the number of writing-systems designed for it. Besides the standard orthography there exists a multiplicity of ancillary writing-systems, some more or less resembling the orthography, others quite independent of it. These ancillaries can be divided into four functional kinds: shorthands, cryptographies, *systèmes d'apprentissage* (e.g., language-teaching transcriptions), and *systèmes de métier* (used in linguistic analysis). If we add the multiplicity of writing-systems designed by spelling reformers as proposed orthographies, we see that orthography itself is another functional kind of writing-system, making five in all. A tradition of literacy leads to the identification, in people's minds, of languages with their standard orthographies. But not all languages have a single, recognized, standard orthography, and some languages have no orthographies at all (though there may be *systèmes de métier* in existence for

them). The preeminence of standard orthographies is based on sociolinguistic grounds. Orthographies as a species of writing-system are designed to serve the general purposes of literacy, and within a language-community these are best served (usually) by the recognition of a single member of the species as a standard orthography. The other four species or functional kinds are designed to serve specialized ancillary purposes, viz., speed, secrecy, language learning, and language study. This classification by functional kind, it should be noted, is independent of classification by structural type (phonological, non-phonological, etc.).[1]

This excursion into the linguistic level of graphology (or the study of writing-systems) was taken in order to make the point that, just as one language is as good as another to establish literacy, so one writing-system is as good as another. If literacy in English is acquired initially in shorthand (attempts were made to teach it that way in the last century), it is still literacy: the biggest step, the extension of the control of language to the medium of writing, has been taken. Obviously, some functional kinds of writing-system are more suitable for literacy acquisition than others, but that does not affect the main point. In the same way, some structural types of writing-system are more suitable for literacy acquisition than others. The standard orthographies in use in the world today are typologically very diverse, varying from non-phonological Chinese character to phonological writing-systems of high phonemicity like the orthography of Finnish. But this does not affect the main point either. If a person learns to control a language *L*, in any writing-system for *L*, whatever its functional kind or structural type, that person is literate in *L*; the literacy may be initial (confined to *L*) or it may be bi-literacy (extended to *L* from literacy in some other language or languages).

In the fourth and final place, the general terms used earlier permitted us to make no distinction (for none was needed) between reading and writing. The two language-media, speech and writing, are used in linguistic communication. The linguacy of the participants in linguistic communication must overlap. They must know at least one language *L* in common. Furthermore, they must have phonological and/or graphological knowledge of *L* in common. In the case of the graphology they must know at least one writing-system for *L* in common. Knowledge includes partial knowledge; as at other linguistic

levels, a person who knows one system also knows other systems which approximate to it.

Knowledge of a writing-system for *L* is exercised both in receiving and in producing *L* in that writing-system, and it is well-known that ability to receive may far outrun ability to produce. Receiving requires knowledge of *L* and a limited knowledge of the writing-system; producing requires this same knowledge plus more detailed knowledge of the writing-system. Knowledge of a writing-system, as with other kinds of linguistic knowledge, does not imply conscious familiarity with the rules of the system. English literates seeing a passage in i.t.a. (a writing-system based on the Initial Teaching Alphabet and designed as a *système d'apprentissage* for the teaching of initial literacy in English) are able to read it at sight, though they are not able to write it accurately without a certain amount of conscious learning. Their ability to read it comes from their knowledge of English and of its standard orthography which i.t.a. closely resembles.

But as far as literacy is concerned *per se*, asymmetry between the skills does not matter. The essential factor in literacy is the exercise of linguacy in the medium of writing; whether it is exercized in both reading and writing or in reading only is immaterial.

Before going on to consider the psycholinguistic components of standard literacy, it will be as well to pause and note some terminological points.

We have used the word "writing" in two senses: as a language-medium in contrast to speech, and as a language-skill in contrast to reading. These two meanings need not cause confusion; but it is important to remember that we can speak of "using writing" or "controlling language in writing" and mean the medium of writing: in exercising either of the skills, reading and writing, we are using writing and controlling language in the medium of writing. A third common meaning of the word "writing" in English is "handwriting" in contrast to print or typewriting. But in this paper we shall not be concerned with the different physical forms which writing, as a language-medium or as a language-skill, can take.[2]

We have used the word "reading" in the last few paragraphs in a single, precise sense—to designate the receptive skill of language in the medium of writing. In earlier paragraphs it was used occasionally

in the phrase "the teaching of reading" or allied expressions. This is the commonest way of referring, in English, to the teaching of initial standard literacy, which we now go on to consider.

"Initial literacy teaching" is a linguistically more adequate name, than "the teaching of reading," for the process which takes place, with others, at the beginning of formal education, viz., the turning of non-literate children into literate children. "Initial" has a double sense, referring to the beginning of the literacy scale and to the beginning of formal education, to which we shall revert at the end of this paper.

We excluded "abnormal" literacy (that of deaf-mutes, for example) at the outset, in order to restrict our attention to the normal situation in which literacy is acquired after articulacy. We went on to stress that this implied nothing about particular languages or particular writing-systems. But the literacy which underlies education systems is more narrowly determined than that. It is "standard" literacy, and in analyzing standard literacy in the individual, I want to suggest, very tentatively, that there are five aspects of it which may be thought of as psycholinguistic components of standard literacy. Three of them are cognitive, one I am not sure about, and the fifth consists of skills which include physical activity. The list of them might be headed "What the literate (standard literate) knows which the non-literate does not know." The five components are:

(1) knowledge of a standard language of literacy
(2) knowledge of its standard orthography
(3) knowledge of the 'technical concepts' of literacy
(4) the linguistic "habitudes" of literacy
(5) the basic skills of literacy: reading and writing.

As the main features of this approach to the concept of literacy have already been described, I will add only brief comments to each of these in turn.

Initiation into a standard language of literacy is the most far-reaching aspect of standard literacy. Continuously expanding control of that standard language, or of a second standard language of wider range, accompanies growth on the educational scale. I will only make two points about this central aspect of literacy. The first is that an education system requires some degree of standardization in a lan-

guage (for the training of primary teachers, production of primers, etc.) if it is to use it for initial literacy teaching. Thus in highly multilingual societies in which the policy of using local vernacular languages for initial literacy teaching is adopted, these languages will be standardized to this extent. The second point concerns, by contrast, the highly monolithic situation of English in England—noting how in our teaching of English as a mother tongue, both at the initial literacy stage and at later stages when it is actually called "English teaching," the notion of "standard language" is often regarded as antagonistic to "creativity" in language. There must be a serious misunderstanding of important linguistic concepts for this belief to be held.

As to the knowledge of the writing-system, I will add to what I have said in the earlier part of this paper two points, one general and one particular. The general one is that the rules for the written representation of morphemes and morpheme-combinations in a language do not exhaust the description of a writing-system. A phonological writing-system is more than a system of spelling. In particular, orthographies are elaborated by the complex punctuation systems, the differentiation resources of upper- and lower-case, italics, etc., the abbreviation devices, reference devices, serialization and sequencing devices, and so on, familiar in European and other orthographies. Literacy-learning in the sense of mastering the resources of a standard orthography can go on for many years after take-off point has been passed on the literacy scale. The second point concerns English spelling and the plight of many English literates long past take-off point whose mastery of English spelling is not adequate for the writing they have to do. It is part of the folk linguistics of English that you either can spell or you can't—with the rider that if you can't, there's nothing you can do about it. This psycholinguistic belief is fairly widespread at all stages in English education, along with even more startling graphological beliefs about the way the spelling system of English standard orthography works, e.g., "totally unsystematic."

It seems to me that "good" spellers have learnt the rules of this system unconsciously (for they can hardly ever give any account of them, beyond reciting "*i* before *e* except after *c*"), and that these rules can be formulated and taught consciously, so to speak, to "bad

spellers"—a task which is not much undertaken in English education at any level today. In characterizing the knowledge of the idealized English speller, we cannot, of course, go outside English. Historically, however, it seems plausible that knowledge of the spelling of French or Latin orthography had a part in the creation of the folk-linguistic belief just mentioned. Educated bilingualism characteristically includes bi-literacy, and is sometimes almost confined to bi-literacy; and even quite elementary forms of bi-literacy, such as a smattering of Latin, can facilitate mastery of, for example, the spelling rules in English governing the morpheme-boundaries between prefixes and stems. But, leaving aside this historical speculation about the origin of the belief in question, it seems to me that a psycholinguistic approach to this aspect of literacy offers some principled grounds for optimism of a kind absent from the current combination of visual memory and fatalism.

For the third component, the technical concepts of literacy, I will refer you to the excellent article by J. F. Reid, "Learning to Think About Reading" (*Educational Research*, IX [November 1966], 56–62), from which the name "technical concepts" comes. The concepts in question are "letter," "word," "figure," "to read," "to spell," and so on; and Reid explores children's acquisition of these concepts in the course of becoming literate in English. Drawing attention to this process of conceptualization was a valuable service in itself.

It is presumably the case that knowledge of the standard technical vocabulary of literacy is not an essential component of literacy; but in standard literacy such knowledge is certainly expected. How important is this overt conceptualization to the process of becoming literate? How much heavier is the load of conceptualization in literacy-acquisition than in articulacy-acquisition? Literacy and intellectual development are intimately connected: how big an intellectual achievement is the successful acquisition of literacy itself? One reason for the presence of the technical vocabulary is, of course, that literacy is imparted by instruction. What, then, is the technical equipment of the instructors as regards the technical concepts of literacy? My own impression is that English initial literacy teachers are not equipped with a clear conceptual framework in this respect. The concepts in question are linguistic concepts, and it is for lin-

guistics to provide such a linguistic framework. The concept of "writing" itself, as a language-medium, is one we can only acquire in becoming literate. The non-literate cannot comprehend what it is. This is the fundamental concept which, however unformulated, underlies our acquisition of the dependent concepts such as "alphabet," "letter," "figure," and so on.

Of the linguistic "habitudes" of literacy, as I have called them for lack of a better name, I can only say that they must not be overlooked in considering standard literacy and its acquisition. The expression is meant to cover such things as the following. With literacy we learn to use language solitarily, engaging in linguistic communication with people not present with us and with people not known to us; to use highly drafted language both in reception and in production; and to use the impersonal and elaborated language characteristic of written communication in standard languages.

Finally, as to the basic communication skills of literacy, I do not want to say anything beyond pointing out that standard literacy requires the acquisition of both the receptive and the productive skill, viz., reading and writing. In different social circumstances in the past, and in special situations today, literacy teaching has sometimes been restricted to imparting the one skill only, reading. But the standard literacy required by modern education systems calls for ability in both skills, reading and writing, and the two are usually taught together.

These five psycholinguistic components of literacy are put forward as a tentative venture into an aspect of man's faculty of language which linguistics as a whole has largely ignored. In applied linguistics there are notable exceptions to this stricture; but for its truth overall one has only to see the thin treatment which writing receives in the general textbooks. In the earlier portion of this paper we attempted to show that literacy is a concern of the linguist because writing is a medium of language. The linguistic study of writing, which we have been calling graphology, has still to recover from the heavy Bloomfieldian blows it received earlier in this century. It is a sign of how far general linguistic theory has moved since then that the study of writing is likely to be revived within linguistics not so much for its own sake as a medium of language (though this would be sufficient

reason) as because an understanding of literacy is required both as a psycholinguistic phenomenon and as a sociolinguistic phenomenon. It is literate society which presents the largest challenge to sociolinguistics (certainly under any "applied" label), and we will conclude by considering literacy under this social aspect.

Literacy can be predicated not only of individuals but also of societies. The importance of literacy in societies is attested in a number of ways. Literacy is the feature in man's cultural evolution which distinguishes pre-history from history: minority literacy is a necessary condition of industrialization. The advanced mass societies of today have followed upon the recent phenomenon of mass literacy. A society with "universal" literacy is a society in which every individual is given the opportunity of acquiring literacy early in life. The importance attached to the promotion and maintenance of universal literacy in a society can be measured by the vast proportions reached by national education systems in the advanced countries and by the efforts expended by the backward countries to establish similar education systems. Literacy and education are not the same thing; but there is an intimate connection between them that requires elucidation.

Interest in literacy as a sociological phenomenon is growing—though neither sociolinguistics nor educational theory and history have been to the fore in this growth. The pioneer work has been done by social historians and economic planners and historians. The last group has been moved to study the literacy rates of the early industrialized countries at the time of their economic take-off in the nineteenth century, in order to throw light on the conditions required for economic take-off by the backward countries in the twentieth century. The general conclusion drawn has been that now, as then, roughly 40% adult literacy is required in a population before industrialization can take place.[3] In their haste to reach this figure the developing countries engage in two kinds of literacy promotion: the establishment of a primary education system, which is a long-term process designed ultimately to turn all children into literates as early in life as possible, and more temporary measures for turning non-literate adults into literates, sometimes by means of special "literacy campaigns."

A terminological point of some significance arises here. Adult

literacy teaching goes on, on a much smaller scale, in the advanced countries too. In Britain, for example, it is partly remedial, for failures from the education system, and partly initial, for adult immigrants. In developing and developed countries alike, it is only in this area of literacy promotion that, in English, the term "literacy" is used. Adult non-literates are "illiterates"—which is a useful distinction to make at the zero and minimal levels of literacy; and in UNESCO usage, which is educationally unexceptional in this respect, only illiterates are the object of literacy teaching.

This is odd. Literacy is fundamental to the educational process; yet the term "literacy" plays little part in educational theory in the English-speaking world. Of course, the theory and practice of making children literate receives enormous attention, but it does so under the general heading of "reading."

The list of five psycholinguistic components of initial standard literacy which we have put forward in this paper may be very inadequate; but at least it puts the literate's linguistic knowledge first and the perceptual and motor skills last, as an indicator, however crude, of where the emphasis should lie.

1. See J. Mountford, "Writing-system: A Datum in Bibliographical Description" in Conrad H. Rawski (ed.), *Toward a Theory of Librarianship: Papers in Honor of Jesse Hauk Shera* (Cleveland: Press of Case Western Reserve University, forthcoming).

2. For points in this paragraph see an earlier article in *The Journal of Typographic Research:* J. Mountford, " 'Writing' and 'Alphabet'," II (July 1968), 221–232.

3. See C. A. Anderson, "Literacy and Schooling on the Development Threshold: Some Historical Cases," Chapter 18 of C. A. Anderson & M. J. Bowman (eds.), *Education and Economic Development* (London: Cass, 1966).

This article is based on a presentation given in Section 3 (Psychology of First Language Learning) of the Second International Congress of Applied Linguistics, Cambridge, England, September 1969.

The Emergence of Gothic Handwriting

Leonard E. Boyle

During the mid-eleventh century Caroline script began to undergo significant changes. The growing market for writings, both academic and popular, demanded a small, clear, and highly abbreviated style. The new Gothic script originated out of this need for compression; e.g., the fusing of opposite curves of letters where they were found back to back and the judicious use of abbreviations. The transitional styles of writing are illustrated.

The year 1200 marks the end of a period of some four hundred years during which the predominant script in Europe was the graceful and unambiguous book hand we now call Caroline. This had been introduced a little before 800, in the time of Charlemagne (hence the name), in order to put an end to the medley of scripts, most of them too contorted for easy private or public reading, that had developed out of the late Roman business cursive in the former provinces of the Roman Empire. Devised after some thirty years of experimentation, possibly at Charlemagne's instigation, the pleasant, controlled, and generally unabbreviated Caroline form of writing was in fact based directly on the legible, unligatured minuscule book hand (semiuncial) of the late Roman period (fourth to sixth centuries). By the year 900, this new hand had conquered most of continental Europe.

About 1050, however, the Caroline script began to undergo small but significant changes. For example, instead of employing the graceful curves and the sharply pointed finishing strokes of pure Caroline writing, scribes now developed a tendency to break and to stagger the strokes of a letter. Thus the top parts of m and n, which were straight in Caroline writing, took on a humped look; similarly, the ends of minim strokes (as in i or m or n) began to turn up lazily and to resemble the trunk of an elephant. These marked departures from standard Caroline practice first appeared in Normandy around 1050.

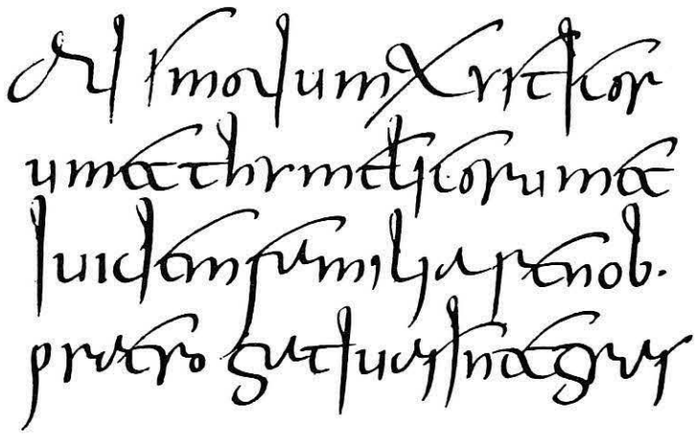

Figure 1. Later Roman, or minuscule, cursive, fourth century. All of the illustrations in this essay were drawn by Hs. Ed. Meyer and appear in his book *Die Schriftentwicklung* (Zürich: Graphis Press, 1958).

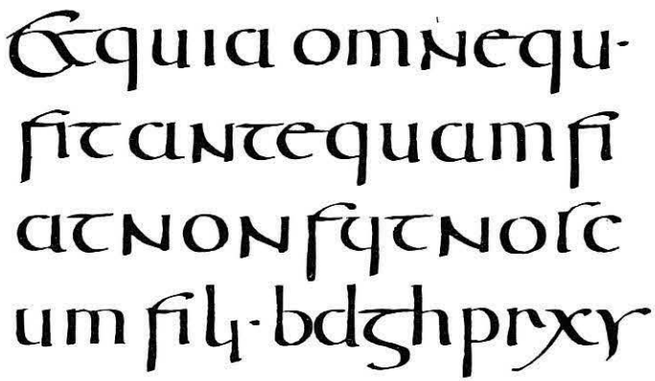

Figure 2. Semiuncial, fifth century.

Probably the shift from sharp finials to a broader, rather snub finishing stroke was due to the adoption in Normandy (and elsewhere, later on) of the obliquely cut pen, which scribes in England and Ireland had been using for their insular script. The Caroline style of writing had been challenging the insular form in England from about 950, when Benedictine monks from Normandy were invited into southern England to promote monastic reform; in turn, the broad insular pen seems to have gained a foothold in Normandy in the next century. It was also in Normandy in the middle of the eleventh century that a further departure from the Caroline canon of writing was to be seen. Where Caroline insisted on letter separation in order to make reading (and reading in public in particular) less subject to hesitation or error, there began at that time the practice of joining certain letters and, indeed, making some letters (e.g., pp, bb) overlap to form a monogram.

These changes heralded the beginnings of that non-Caroline form of writing to which the humanists of the fifteenth century, despising it as barbarous when compared to Caroline, attached the label "Gothic." However, the era of full-blown Gothic did not commence much before 1200. Caroline writing, but with the intimations of Gothic noted above, dominated the eleventh and twelfth centuries: the script continued to be clear and spacious, and abbreviations were kept to a minimum. Yet there were definite indications from 1150 onward that a growing demand for books, a widening readership, and the increasing use of the written document for business transactions were bringing about a general abandonment of the leisurely Caroline hand. The twelfth-century renaissance, a direct result of the quest for original sources and a scientific methodology begun during the Gregorian reform (1050–1100), saw a multiplication of schools, scholars, and treatises. After the publication of the two most influential syntheses of the twelfth century—the *Decretum* of Gratian for church law about 1140, and the *Sentences* of Peter Lombard for theology some fifteen years later—whole new classes of legal and theological literature come into being: glosses and commentaries, questions and repetitions, summae and distinctiones, and the like. In addition, the growing literacy of the clergy, a process hastened by educational decrees of the Third Lateran Council (1179), especially that which established chairs of grammar in every cathedral church,

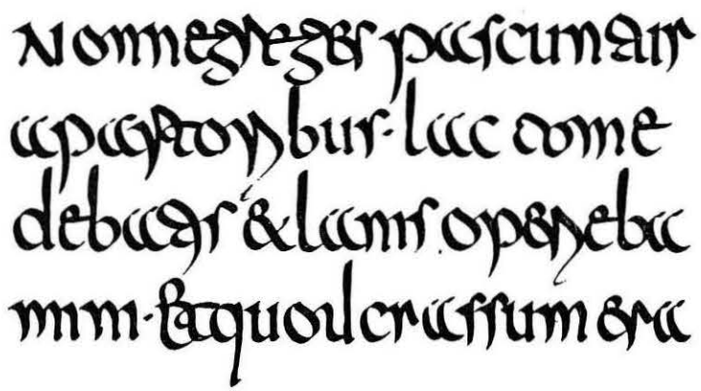

Figure 3. Pre-Caroline book hand, seventh century.

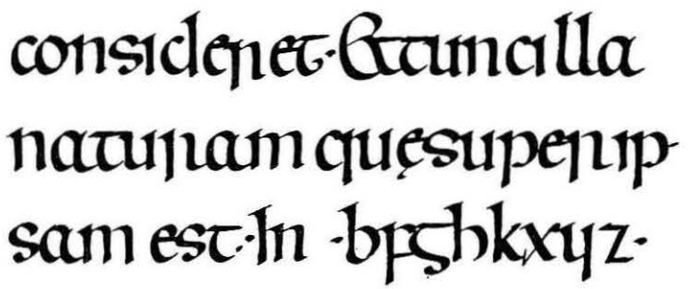

Figure 4. Anglo-Saxon insular writing, eighth century.

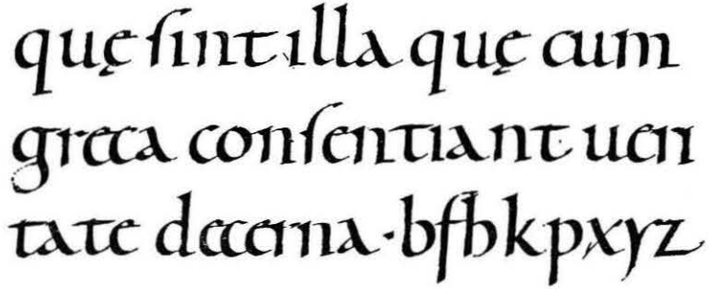

Figure 5. Caroline writing, ninth–tenth centuries.

occasioned a demand outside of the schools for cheap, portable books of a none too professional nature; and it is significant that the first popular manuals of theology and law began to appear about 1200.

Given this growing market for writings, both academic and popular, it was only a matter of time before the generously spaced and uncluttered pages of a typical Caroline manuscript gave way to a more economical layout and to more parsimonious methods of writing. Further, the great upsurge of scholastic learning at Bologna, Paris, and Oxford had brought about the eclipse of monasteries as the chief centers of book production. Professional non-monastic scriptores were now emerging as a class; and what these scribes needed in order to meet the rising demand for the written word was an expeditious and profitable yet legible method of writing as much as possible in the

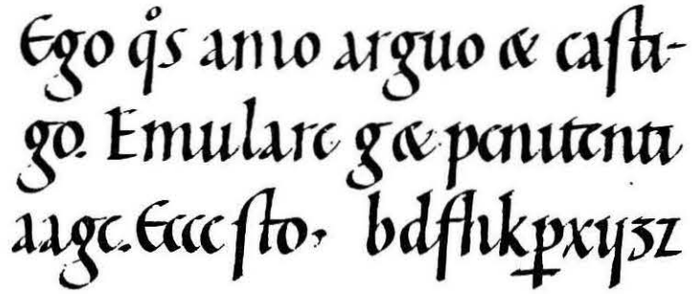

Figure 6. Caroline writing, eleventh–twelfth centuries.

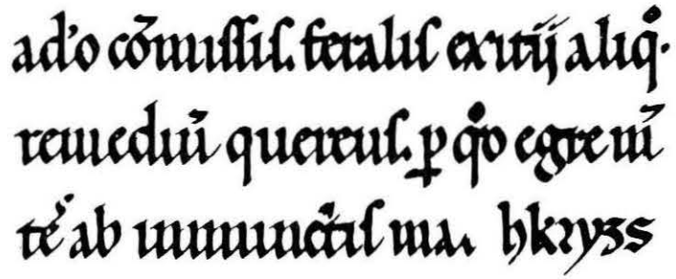

Figure 7. Caroline writing, late twelfth century.

smallest possible area. In fact such a method lay readily to hand in the small, clear, and highly abbreviated style of writing that had developed out of the Caroline book hand in chanceries and business centers of the twelfth century. This neat, "cursive" hand enabled a lot of ground to be covered quickly with a freely flowing pen, and was ideal for recording or for preserving file copies (rolls, registers) of business transactions, state and legal affairs, and ecclesiastical correspondence; by 1200 it was an established form of writing, best seen in the earliest extant series of registers of papal letters (1198–1216: Innocent III), or in the earliest groups of English administrative documents from the same period (1199–1216: King John).

The influence of this cursive or documentary hand is clearly reflected in the changeover in literary productions about 1200 from the large, expansive Caroline hand to a minute and sometimes

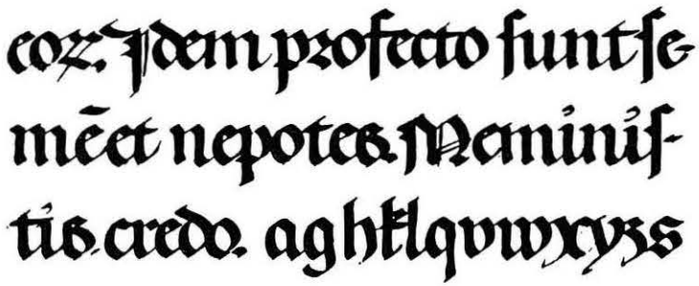

Figure 8. Early Gothic, thirteenth century. Note the feet of m and n, the fusion of curves (de), and the Gothic r in the first line.

Figure 9. Angled Gothic, fifteenth century.

crabbed style of writing. The script now became smaller and more compressed than Caroline, and abbreviations began to abound, all in the interests of time, space, and increase of output. The disruption of the Caroline canon of writing, which had been threatening for some one hundred and fifty years, was complete.

In this new Gothic script the most significant and far-reaching departure from Caroline—the mark, indeed, of pure Gothic—was the

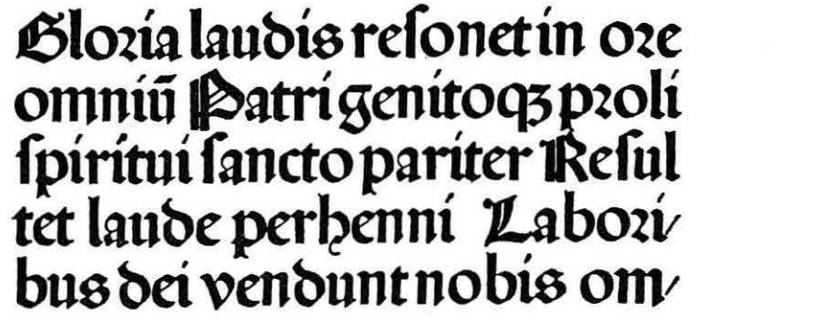

Figure 10. Rotunda, printed type, fifteenth century. Note the Gothic r and capitals.

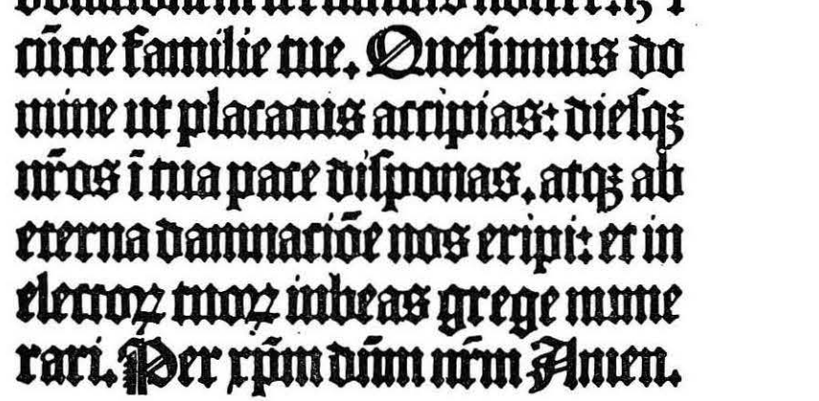

Figure 11. Textura, printed type, fifteenth century.

phenomenon of combining or fusing the opposite curves of letters where these were found back to back. The breakdown of Caroline had begun with the introduction of the obliquely cut insular pen and with the overlapping of certain rounded letters; now, the better to save space, scribes began to fuse opposing curves where possible. Thus, when a letter such as o was preceded by a letter such as p, or was succeeded by a letter such as c, the bow or curve of one letter was merged with the opposite bow or curve of the other (e.g., po, oc; bc, bd, be, bg). By 1220 this was a steady (and for dating purposes, invaluable) feature of the new book hand. Not every word, of course, provided a ready-made juxtaposition, back to back, of opposite curves, but a judicious use of abbreviations offered over a hundred combinations of bows and curves (thus the opposing curves of *o* and *e* in *omne* could be merged in the abbreviated form $\overline{\text{æ}}$). The fashion became so popular, indeed, that scribes often imposed curves on uncurved letters, forcing them to merge with the curves of naturally curved letters. The wide use of the old "uncial" form of *d* (ð) as an alternative to the regular minuscule d, probably was due to the fact that the availability of two forms of d almost doubled the range of fusion of d with bowed letters.

This phenomenon of the "fusion of opposite curves" is at its most elegant in the *scriptura rotunda* of Italy (and especially of Bologna) from 1250 onward. In centers outside of Italy, however, there developed a form of compression that made the bows of letters more angular than round, so that the merging of curves in the Gothic of northern countries was more often than not a merging of angled bows.

In fully developed Gothic, whether curved or angled, letters follow one another with mathematical precision. Generally the writing tends to be heavy, but there is always a harmony of angle with angle and curve with curve; the almost invariable use of a Gothic r (a letter resembling the Arabic number 2) after the letter o instead of the straight Caroline r, is a good example of the preoccupation with symmetry, for the 2 form of r, with its pleasant curves, blends more agreeably than the plain r with the bows of o, as in o2. The use of the broad pen heightens the impression of weight and solidity, echoing to some extent the Gothic architecture of the period. A page written in the full, disciplined Gothic looks very much like a woven pattern

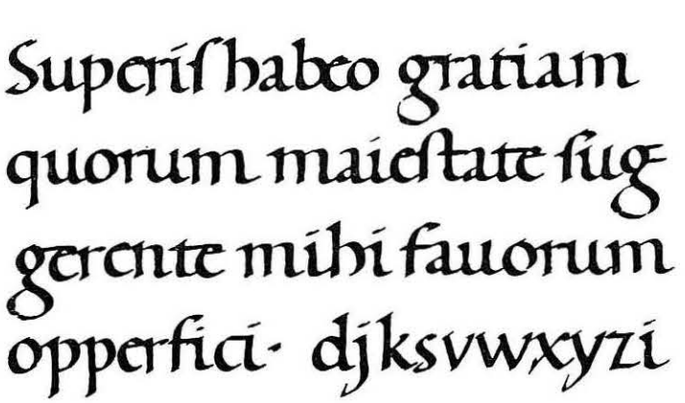

Figure 12. Humanistic script: a return to Caroline, fifteenth century.

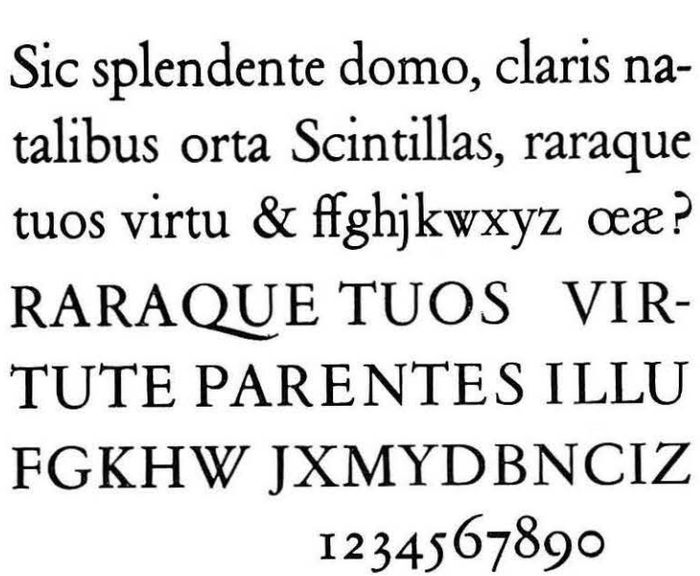

Figure 13. Humanistic type, about 1500.

or *textus*, suggesting the name *text hand* to some scholars. Capital letters, too, underwent a change because of the general use of the broad insular pen, and the shallow "rustic" capitals of the pure Caroline period gradually gave way in the late twelfth century to more rounded or squat forms. In Caroline writing, capital letters were chosen from some obsolete majuscule script, such as rustic or square or uncial, in order to set them off from the miniscule script used in the body of the text. After 1200, however, it became the fashion to turn capitals into larger versions of the letters of the text itself, and to single them out by a generous use of ornamental strokes. As a result, Gothic capitals are often so elaborate that they are more difficult to decipher than the sentences or names to which they are prefixed.

It is, then, to this solid if monotonous script that we owe the transmission to our day of much of ancient and medieval literature. The great period of the script was from 1250 to 1350, and it was the classic text hand of those years that the first generations of printers adopted as their typeface in the second half of the fifteenth century. By that time, however, Gothic had degenerated considerably, and was in fact on its last legs. From 1400 onward, the new humanist learning, with Florence as its focal point, had been arguing successfully for the revival of the *antiqua littera* (Caroline) that had preceded the Gothic era.

By 1500, printers, too, were abandoning Gothic, with all its abbreviations and ligatures. Today it is the modified Caroline minuscule promoted by the humanists that we write and print. But Gothic is not forgotten. The vast riches of medieval manuscripts and monuments, the script used in some book titles, not to speak of display scripts of "Ye olde tea shoppe" variety, all serve to remind us vividly of the Gothic turn that Caroline writing took around 1200.

Some Thoughts on the Use and Disuse of Diacritics

Louis Marck

The diacritics discussed here are symbols that are part of the official spelling of various languages, such as ´ ` ^ ¨ ˇ ~, etc. The uncertainties and vagaries of their use or non-use in current American practice are illustrated with examples from reference works, style books, and current periodical literature. Particular criticism is leveled at the inability of the printed media correctly to reproduce names from such languages as German, Czech, and Polish, leaving even the cognoscenti in the dark as to proper pronunciation. Problems of information storage and retrieval as well as typewriter design are touched upon. A plea is finally made for better knowledge and international acceptance of diacritics, the alternative being a concerted international effort for their progressive abandonment.

Webster's Third New International Dictionary defines the noun *diacritic* as follows: "A modifying mark over, under, after, or through an orthographic or phonetic character or combination of characters indicating a phonetic or semantic value different from that given the unmarked or otherwise marked character—compare ACCENT 5a." A pursuit of the cross-reference yields the terms *acute*, *grave*, and *circumflex* as well as typographical but unidentified specimens of *dieresis*, *tilde*, *macron*, and *cedilla*. One is also confronted with the printers' term *piece accent* and its synonyms *floating accent* and *loose accent*.

If the information seeker turns from *Webster III*[1] to other sources, he will be completely let down by the *Britannica*, find a lengthy but poorly organized treatment in *Collier's Encyclopedia* and a very meager and unsatisfactory entry in the new 20-volume *Brockhaus* s.v.

1. Since phonetics as such is not under discussion here, nothing will be said about *Webster III*'s own use of diacritics in its pronunciation key ("still fundamentally a diacritical key" as Dr. Gove calls it in his preface). Although bolstered by admirable, if occasionally tortured, reasoning, some of its practices seem doubtful, to say the least. Thus, persons of British background and those familiar with German cannot but be baffled, for different reasons, by the use of \ä\ for the vowel of *cot*, *hot*, *not*.

Diakritische Zeichen, and, with luck, may stumble upon a treatment that does some justice to the topic, such as the one in the latest *Americana*.[2]

It seems hardly necessary to document the marginal status to which diacritics have been consigned in Anglo-American orthographic practice. The average educated person is obviously aware of the existence of "accents" in "foreign languages" but tends to regard their use in English as pedantry. This tendency is abetted by *Webster III*, which, for *café*, *coupé*, etc., lists alternate unaccented forms and prefers *facade* to *façade*, as well as the *U.S. Government Printing Office Style Manual*[3] which bluntly states that "Diacritical marks are not used with completely anglicized words" such as "*coupe*, *facade*, *fiance* (masc., fem. [sic]), *frappe*, *garcon*, *souffle*" while, on the other hand, considering diacritics to be "an essential part" of the spelling of *cañon*, *résumé*, and *passé*.[4]

No attempt will be made in this paper to give anything approaching an exhaustive inventory of all Latin-alphabet diacritics used throughout the world. Such a long-range undertaking would, of course, be extremely desirable, especially with regard to proper terminology and phonetic value.[5] At first glance, the Foreign Language Section of the Government *Manual* seems to embark on a complete inventory, but, as languages become "less familiar," the procedure rapidly reaches the vanishing point. For French, at least, the inventory is all but complete: (p. 405) "French uses the Latin alphabet with the addition of the following special characters: à â ç é è ê ë î ï ô ù û ü."[6]

2. *Encyclopedia Americana*, 1969, IX, p. 53. Robert L. Chapman, Drew University.

3. Revised Edition, January 1967, p. 53.

4. Some of these and other examples will be adverted to more fully later on. Given the lack of an *Académie Américaine*, we need, of course, not be surprised by discrepancies between the Government *Manual* and *Webster III*.

5. It should obviously include the phonetic values of all unmodified letters and combinations thereof.

6. "All but complete," since the digraph œ ought to be considered a "special character." The last item in the list, ü, might look strangely un-French to some. It is, however, correct (as a *tréma* or dieresis) in the Biblical name Saül and, quite idiosyncratically, in the name Fulgence Bienvenüe ("father" of the Paris Métro). Unfortunately (but understandably, in view of the muteness of the final e), many Frenchmen misuse it in *aigüe*, *cigüe* (for *aiguë*, *ciguë*). French printers are also apt to

It is almost impossible to draw a neat dividing line between the two sets of problems this paper will attempt to deal with in what must needs be a highly selective fashion: on the one hand, there are the technical questions of typeface availability, compositorial practice, typewriter keyboard design, etc.; on the other, more fundamental ones pertaining to linguistics, pedagogy, orthography, orthoepy, and international communication.

To start with technical questions: The Government *Manual* lists no less than 13 "special characters" for French. This seems to impose an additional load of 50% on the normal alphabet! Obviously, this burden can be reduced to just five diacritics: four superscript and one subscript. The problem is that of unit character vs. piece accent. In penmanship, diacritics are handled in the same way as we "dot our i's and cross our t's."[7] In printing and compositorial practice, however, the recurrent use of piece accents tends to waste time and to produce poor esthetic effects. A good French printing plant therefore keeps the above-mentioned special characters on hand for all its typefaces in both lower- and upper-case.[8]

While one can learn to live with the truncated spellings of such common words as *facade* and *frappe*,[9] the same cannot be said for the names of persons and places that come to the fore in the march of current events. How do newspapers, how indeed does *the* newspaper handle them? To put it briefly, it is not up to the problem. To quote

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transform *Fräulein* into *Fraülein*, and a hypercorrect umlaut is frequently bestowed on the name of the German composer Gluck.

7. Some are taught to do it at once, others to go back over the word, which opens up a vexing pedagogical problem, especially in the United States, where i-dots are apt to float in outer space and jumbo line to cross the several t's (as well as all other ascending characters) of a particular word. The problem can be especially vexing to foreign-language teachers.

8. In French the use of diacritics in upper-case is subject to complicated and fluctuating restrictions and allowances. In display and slick-paper printing a great deal of experimentation, most of it execrable and internationally irresponsible, is carried on with fused or streamlined diacritics (in *Match*, one needs a protractor to tell the acute from the grave!). For a linguist's eyes, the worst such offense happens not to be French: it is a "macronized" umlaut now prevalent in Switzerland.

9. De Gaulle's notorious *force de frappe* has not been heard of much lately. Should it come back into the news, one will again have to put up with the naïve mispronunciation *force de frappé*.

from page 31 of the *Style Book of The New York Times* (1950 edition): "The German umlaut (¨) is available, except in agate, for all the vowels, but since *it cannot be used in heads* [italics mine], preference should be given for the sake of uniformity to the use of the additional "e" instead of the mark. Set as follows: Fuehrer (not Führer), Tannhaeuser (not Tannhäuser)." This opens up a Pandora's box of problems: to begin with, how many typesetters are actually aware of the possibility of substituting postscript e for the umlaut? What about long-sanctioned patronymic preferences, the most notorious pair of examples being Goebbels *vs.* Göring?[10] Finally, there is the paradox of "heading *vs.* text." The naïve peruser of *The New York Times* cannot help thinking that more care would be lavished on the "large type" of headings than on the columns of running text and that the spelling of names in these headings should be the "real" one. But it just is not so! In the light of the *Style Book* caution italicized above, whenever names with umlauts or other diacritics appear in the text, these diacritics are invariably absent from these names if they appear in the heading. Some time ago, this writer broke into shouts of amazement when, for the first time, a slightly unbalanced and thus obviously ad-hoc umlaut did appear in a heading over the name of the German clergyman Küng. (Kung would perhaps have looked too "Chinese"?)[11]

There is one diacritic which is only sporadically used in the text columns of *The New York Times*. It looks like an inverted circumflex (ˇ), is sometimes so called (or even less felicitously "wedge") but

10. The *writer Reinhard* Goering died ten years before the suicide of his namesake. In the field of information storage and retrieval, the problem is one of alphabetization. Most German reference works treat umlauted vowels (whether with diacritic or with postscript e) on a par with the non-umlauted ones; American reference works obviously do not. In *Webster VII*, Goebbels thus follows Godunov while in the "little Knaur" Goebbels precedes Godunow by a page. At the other extreme is the Scandinavian practice of putting the diacritic vowels at the end of the alphabet. Czech is somewhere in the middle, with some diacritic letters immediately following their non-diacritic counterparts, others being lumped with them. All this obviously cries out for international standardization.

11. As for the now-defunct program booklet of the radio station of the *Times*, WQXR (with all those "foreign" composers!), it had a lopsided and esthetically monstrous appearance: while all the required diacritics were used, they were God knows how many points larger and heavier than the actual letters which they seemed to crush with their weight.

should properly be referred to by its Czech name, viz., *háček* ("little hook"). It goes back all the way to Jan Hus, but one had to wait until *Webster III* to find its proper name in an American dictionary. It is also used in all other Balto-Slavic languages using the roman alphabet, with the exception of Polish which has clung to postscript z. In the light of international reluctance to its use, one cannot help wondering whether the Czechs at least might not, in retrospect, wish they had stuck to the additional z. L. L. Zamenhof correctly gauged its unfamiliarity to Westerners and boldly replaced it by an actual circumflex, so that Esperanto ĉ and ŝ are equivalent to Czech č and š. For reasons of typewriter-oriented symbol economy and the favoring of the unit-phoneme hypothesis for affricates, American linguists such as Gleason prefer š ž č ǰ to the corresponding single or multiple IPA symbols. But while one additional dead-key symbol on their typewriters thus accommodates four phonemes, their textbook presentation treats these symbols as four separate units. To come back to the function of the háček in Czech: its presence or absence makes all the difference in the world. To explain it in simple terms: c, s, z stand respectively for the *ts* in *tsetse fly*, the *s* in *seal*, and the *z* in *zeal*; č, š, ž for the *ch* in *chin*, the *sh* in *shin*, and the *Zh* in *Zhukov*. The events of 1968 and their aftermath have filled our papers with new and unfamiliar Czech names. If one reads about Dr. Ota Sik, one has no way of knowing whether it is Sik or Šik or Sík or Šík, in other words whether it is homophonous with sick or Schick or seek or sheik. All one can hope for is that Joseph Wechsberg will mention the name in one of his ever rarer reports in *The New Yorker*.[12] Better known names, such as Dubček, usually get their háček also in *Time*, *Life*, *Newsweek*, etc., but of late it has been absent from the *Times*. The /ts/-value of *plain* c in such names as Václav or Polish Wrocław ("rock law" to some of those who know of it in the first place) is something few

12. This magazine is the last bastion of diacritics. It can usually be taken as the last word in the spelling of foreign names. It will not tolerate a *facade* and it stubbornly clings to such spellings as *coöperation*, *reëstablish*, *reëntry*. In *coöperation*, the hyphen often replaces the dieresis, but a case could be made for *coöperation* "collaboration" *vs. co-operation* "joint operation." In teaching the virtues of the dieresis, this writer has been wont to say that, without it, some one might be /neyv/ enough to think that /rayz/ Stevens was singing in /éydə/. He actually heard *Aïda* pronounced as though she were "from Decatur."

Americans are aware of. Thus, the sadly notorious place name Lidice is usually mispronounced as though either the spelling were Lidiče or Czech were Italian. During the Austro-Hungarian tutelage, Austrians and Germans did not bother with "Bohemian" spellings, but used German orthographic equivalents. Some of these became standard, e.g., Tscheche, etc., Hradschin. About 20 years ago, the West Bohemian town of Aš or Asch was in the news as the departure point of what would now be called a train hijacking. The German form *Asch* is obviously preferable to a háček-less *As*. One sound for which no German orthographic equivalent exists to this day is /ž/. In one of the editions of Marie von Ebner-Eschenbach's short story "Božena," a háček could actually be found adorning a Fraktur z (a typographical misdemeanor in German typesetter's code!) for whatever good it might have done the uninitiated German reader, who might have made a mistaken association with Bolzano (ex-Bozen) in South Tyrol. While we in English can make a clear distinction between two Russian names such as Shukov and Zhukov,[13] a German encyclopedia would have them both as *Schukow*. The "soft" or voiced pronunciation of the "sch" in the second name might then be parenthetically indicated by a thin horizontal bar running the length of the trigraph. This writer's Silesian idiolect has a few Slavic words with /ž/ that are practically unspellable in German. The Germans continued their respelling practice beyond 1918. When Hitler was ranting against him, the name of Eduard Beneš always appeared as *Benesch* in German publications. Nowadays, German encyclopedias use *Beneš*, the pronunciation of which then has to be explained. But present-day German newspapers are as guilty as the American ones in their disregard of the háček and other diacritics (unless they happen to coincide with umlauts: Ismet Inönü—a *capital* dotted I is of course beyond most printers' capabilities!). A respelled *Dubtschek* might be preferable to the *Dubcek* presently seen in these German publications. But respelling has not yet run its course: Jaroslav Hašek's brave soldier Švejk is found as *Schwejk* in recent German encyclopedias,

13. This *zh* has been enshrined for generations in the pronunciation keys of dictionaries and is also found in countless French phrase books for travelers. Yet, most Americans seem strangely unfamiliar with it, and making them see the proportion "s : z :: sh : zh" is quite a teaching problem.

mistakenly as *Tchveïk* in the 1955 edition of the *Nouveau Petit Larousse*, and will appear as *Chvéïk* in a new French translation about to be published. The only way out of this morass seems to be adherence to the native spelling, diacritics and all, leaving respelling problems—and they are legion—to the transliteration of languages that do not use the roman alphabet.

At the outset of the foregoing lengthy discourse on the háček, Polish was mentioned as using a postscript z instead. Its spelling is encumbered by the worst of both the extra-letter and the diacritic system: unwieldly combinations of letters such as szcz and internationally unreproducible diacritics such as the dotted z, the barred l, and the nasalization hook under a and e. The four letters szcz would be reduced to two in Czech (šč) and of course to one in Cyrillic (щ), but our own transliteration of the Cyrillic symbol has four letters (shch) as in Khrushchev, not to mention the seven required in the German Chruschtschow. A German "phonetic" respelling of Szczecin (ex-Stettin) would have to look like this: *Schtschetchin*. The accumulation of consonants may look awful, but it is not the real problem. That is found not only in the unfamiliar diacritics but also in the use of the acute over letters that normally do not have it: c n s z. Of the unfamiliar diacritics, the worst is the nasalization hook, called "inverted cedilla" by the U.S. Government *Style Manual*. This writer is not sufficiently grounded in Polish to say whether the Poles themselves might not advantageously replace it by a bona fide postscript n. As it is, its presence is mostly ignored by non-Polish printing presses. In modern Polish printing, the combination ą sometimes looks like an underdeveloped q; no problem to the Poles, since q is not part of their alphabetic inventory. To those not familiar with the problem, the situation can become totally confusing when they attempt to check reference works for the spelling and pronunciation of certain place names. Take the city spelled Tschenstochau in German and Chenstokhov in our transliteration of Russian. Between *Webster VI* and *Webster VII*, the nasalization hook of Częstochowa got lost, but the N of the former's pronunciation indication is still reflected in the n(t) of the latter. The *American Heritage Dictionary* does again have something under the e, which, on close inspection, reveals itself as a non-inverted cedilla. As for Oświęcim (Auschwitz), it lost both its acute and its inverted cedilla in *Webster VII*, so that the pronunciation

indication \ȯsh-'vyeⁿ(n)-tsēm\ must be especially puzzling to those (unfortunately few) who would want to be guided by it.[14]

There is no point in further expanding this catalogue of international confusion. Before coming to some utterly tentative conclusions and recommendations, something more should be said about the problems of the typewriter. Linguists, such as this writer, are wont to have their machines "altered" by sacrificing commercial symbols and redundant punctuation marks (if the letter l does for the figure 1, so can a capital o for zero!) and having appropriate keys "deadened." Sometimes they may hanker for the double-shift models of their grandmothers. So-called international keyboards are usually deficient. Of late, changeable type has been introduced, and the available symbols could be expanded. But the use of such floating accents creates problems of proper alignment and excessive impact (the other side of the sheet is apt to have a Braille-like appearance!). For this reason, and probably even more for reasons of speed, the various national keyboards go in for fixed combinations. Thus, the standard German keyboard wastes three full keys for Ä ä Ö ö Ü ü, but then has no floating dieresis for such items as *Aëro-* or *Alëuten*. To say nothing of *Aïda* or *Haïti* (no wonder *we* pronounce it as we do!), because in the absence of a dotless ı, the attempt to superimpose a dieresis on an i, is foredoomed. Even the French keyboard does not allow for it, although ï is quite frequent in French, even in common words, as is î which will always appear as a legible but somewhat ludicrous î. The French keyboard has a fixed ç, but only in lower-case, although the cedilla is the one diacritic which can never be left off a capital. Again, this list could be continued ad nauseam. While this is an area where individual resourcefulness can produce remedies, the condition of 99.9% of the typewriters in use is obviously a potent factor in the progressive disuse of diacritics, as is the increasing use of automated equipment in the production of printed output.

Is the use of diacritics then doomed in English? To the person who knows that items such as *resume* (noun!), *fiance*, *facade*, *naive*, etc.,

14. In *Webster III* the first of the two place names is listed (without inverted cedilla) by virtue of that work's tortured "of or from" policy. But the n of the pronunciation indication has been left out by typographical error, the parenthesized t attesting to its intended presence.

"ought" to be spelled with the relevant diacritics, their absence actually is no great problem and is easily compensated for by a built-in margin of safety that has come to be called "redundancy." But the person who meets these words for the first time and wants to learn them seems to be at a great disadvantage. And if that person's teacher does not know her diacritics, this can only abet the deleterious and growing distrust of any fit between spelling and pronunciation. Here then is a very simple plea: as long as these diacritics still exist and function in English, they ought to become part of the curriculum. They might even give a reprieve to the spelling bee.

To what extent can we get along without diacritics? Of the major language using the roman alphabet, English has practically reached that stage. It might be more correct to say that a comparatively brief vogue of naturalizing foreign diacritics has just about run its course. German *can* also be spelled with nothing more than the unmodified 26 letters. Every literate German has learned to accept, and on occasion use, postscript e as a substitute for the umlaut. Where possible, the cedilla problem has been eliminated by respelling: *Fassade*, *Fasson*, but not in *Garçon*! Non-existent alternatives such as **Garβon*, **Garsson*, or even **Garszon* point up the one remaining problem, viz., β and its total abandonment, whose historical, phonetic, and graphic aspects are outside the scope of this paper. Italian manages with *one* "accent" whose graphic realization accordingly is allowed to fluctuate from grave to acute to apostrophe. So could Spanish where ñ could become nh as in Portuguese or even ń as in Polish. Major reforms would be required for French, Balto-Slavic, and Scandinavian.[15] As for Vietnamese, all this writer can do is mention it as an untouchable *non plus ultra* of diacritics.

The foregoing should not be construed as haphazard and half-baked suggestions for international spelling reform. All that is meant to be suggested is the presence of such a possibility. In our common heritage of 26 letters, there are obviously scores of potential digraphs which could take the place of diacritics. Their confusion with sequences of discrete symbols (a confusion which has already led to

15. Were the Danes on the right track when they replaced aa with å in 1948? In all of these languages, the dieresis would have to be preserved on an optional and pedagogic basis.

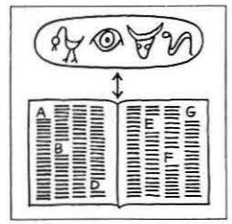
many "false" spelling pronunciations in English) could be obviated by optional italicization or actual underscore (sheepshead as against sheep*s*hearer). To the users of the roman alphabet in this shrinking world, two courses seem to be open: international standardization and mutual acceptance of diacritics or a common endeavor toward their progressive elimination.

Letterforms in Photo-typography

Adrian Frutiger

The accelerated flow of information in today's world demands that our typography be of maximum utility and comfort to the reader. There is a trend toward universal usage of fewer text faces and toward larger sizes of reader typefaces. Differentiation must be made between material designed for sustained and for reference reading. The two basic photo-composition generation systems—projective exposure and CRT generated—are compared.

Philosopher and scribe (Pythagoras, Cathedral of Chartres).



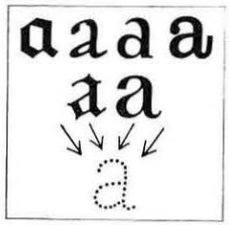
3000 years of writing.

I. Obligations Toward the Reader

Two thousand years ago reading and writing were the privileges of an extremely small class of people. Today the right to education belongs to the broadest masses of the world's population. The reasons for the constantly mutating forms of our alphabet lie anchored to some degree in that perpetual drive toward the widest possible dissemination of human knowledge.

The written word has always been a binding force between two worlds: those of human ideas and of human deeds. Putting a thought into writing is obviously nothing more than a physical act, whether it is accomplished by hand with a chisel or pen, or whether in today's technology it is accomplished by activating a composing machine. However, the actual letterform has always constituted a mirror image of the writer's intellect. The spirit of a century, of a historical era, has never found a more explicit form of expression than in the art and technique of its style of writing or its typography.

In the dawn of history a strong hand chiseled pictorial symbols into stone—perhaps three, perhaps four during the course of an hour. Today electronic machines compose millions of letters in the same lapse of time.



Trend toward an internationally valid character formation of the roman alphabet.

Two factors may be deduced from this development:

(1) The constantly accelerating desire of man toward increased knowledge induces our technicians to invent faster means of reproduction, i.e., the composition and printing phases are accomplished at incessantly rising speeds.

(2) The universal usage of text typefaces leads to a standardization of their forms. Only a few decades ago—in every country of the occidental world—numerous, different national typefaces were in existence. Today we are experiencing a stabilization toward internationally accepted text types based on the roman alphabet and subdivided into groups like oldstyle, modern, and sans-serif, with each group containing no more than three or four well-designed typefaces used on a world-wide basis.

It should be emphasized that the above statements pertain to text types. Display typefaces are, in effect, experiencing a development which leads to the opposite direction: photo-display setting equipment has freed the design of letterforms from the inflexibilities of type metal and has engendered an overabundance of type and lettering styles never observed in the past.

Thus the developments go in two directions: on one hand we notice a trend toward an increasing flood of printed or written information, on the other hand a certain unification and simplification of letterforms, caused by the implications of mass production methods.

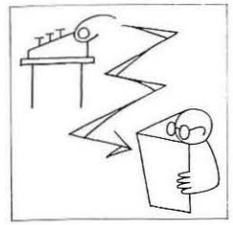
What, then, are today's requirements for text composition?

Quick and comfortable reading with a legible typeface.

Legible typefaces

Text types have taken on utilitarian aspects. It becomes increasingly important that their structures comply with those legibility comfort requirements which must be present if a text typeface is to be acceptable to the widest possible segment of the public. As an analogy: smooth roads, soft beds, large windows, and sound-proof walls spell comfort to the average human being. The same feelings may be applied to optimum reading comfort of the printed word: suitable paper, sharp printing, well-justified

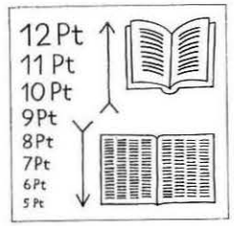
composition, and clean, open, universally recognized letterforms guarantee optimum legibility. Rapid reading has indeed become a sign of our times.



The value of communication depends on its timeliness.

Fast, economical communication

Information is meaningful only if it reaches the recipient within a definite time limit. The path from the event itself to the reader must constantly be shortened, whether we talk about the press, about advertising, or about the book publishing field. The speed factor is frequently directly related to cost considerations. As, for example, in the case of newspapers, sales literature, time tables, technical specifications, etc., the information must be available at a reasonable price. The graphic arts techniques of our century are dependent upon constant acceleration of composition speeds.



Type sizes become larger for reading, smaller for reference material.

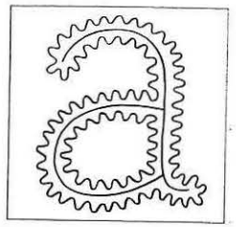
Determining type sizes

Until a few years ago text type sizes showed a noticeable trend toward a continuous drop in point sizes from decade to decade. The progress of technology made it possible to decrease the 24-point types used during the Gutenberg era to the 5- or 6-point type sizes utilized today, without seriously impairing legibility of the text. (Social and economic progress caused by the invention of electric lighting undoubtedly contributed toward this development.) On the other hand, sales statistics from the United States reveal a growing trend toward larger text type sizes in the book publishing field. Even in Europe a certain hesitancy toward the application of smaller point sizes for extensive book texts has become noticeable.

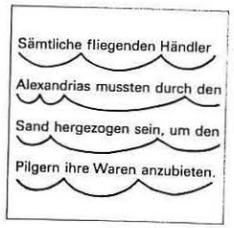
In this connection it should be noted that there exists an ever increasing necessity to divide printed material into two major categories: print to be read continuously and print to be consulted briefly. On one hand we have the immense category of information encompassing printed material which has to be read in a consecutive manner. In spite of earth-shaking prophecies in favor of the electronic audio-visual communications media, it can now safely be stated that (perhaps because of psychological and

physiological conditions inherent in the human constitution) the amount of reading material and the speed of reading will incessantly increase, so long as a precise understanding of the information is of essence. Typographers are leaning toward the usage of type sizes which enable the reader's eyes to perceive printed material for hours on end without fatigue.

On the other hand, we have the area of typography designed for reference material—trade lists, telephone books, dictionaries, manuals, etc. Reading this type of printed matter is usually confined to rather limited periods of time. Here a maximum of information has to be condensed into a minimum of space. For that reason the most ubiquitously used type sizes will be near 6-point. In the future, computer output printing will increasingly use this kind of "reference" typography. The type designer working on new letterforms within this group will have to observe the laws of automatic-optical legibility in his letter configurations.



Depth-psychological character formation.



Word shapes, not letters, are read.

Two new concepts of quality

Each letter must conform to a basic form embedded in the subconscious mind of a large mass of readers. We know, however, that the eye of the reader is more sensitive to the over-all appearance of the typographic construction than to minute detail in individual letterforms. Within a single glance or fixation point, the reader perceives word shapes, groups of words, or entire portions of a sentence. Single letters, though their shapes must be familiar, are perceived merely as parts of a whole.

To a typefounder or manufacturer of photo-typographic alphabets the most important factors are, therefore, harmoniously balanced white spaces around the letters, open counters, and precise adjustment of the spacing between characters.

The term typographic quality has to be considered from two points of view, which may be exemplified as follows: a newspaper reader will hardly consider the screening or break-up by scanning lines of a wirephoto an actual communication-impairing factor. On the other hand, he will reject as unacceptable a blurry, poorly printed half-

tone illustration in a travel folder or a catalog. Precisely the same distinction holds true for the area of typographic legibility. The visibility and legibility of printed matter intended merely for information or reference does not necessarily have to attain the same quality level as that of books in the literary field.

II. Photo-typography

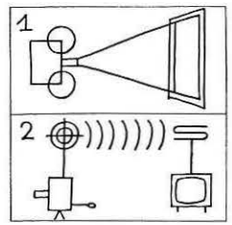
For 500 years the technology of type composition had ahered to basically unaltered principles. Metal composition—by hand or machine—was able to satisfy all requirements of the printing and publishing fields. Then, a mere 20 years ago, new composition techniques were perfected because conventional methods of typesetting technology were no longer able to cope with incessantly growing amounts of information. The invention of photographic composition can therefore not be termed a mere coincidence. It grew out of a sociological and technological necessity, and it enabled the graphic arts to face the challenges of the future.

During the relatively short developmental period which photo-typography passed through during the last two decades, we can already distinguish among several photo-composition equipment generations, two of the basic ones shall be mentioned here:

1. Machines which operate exclusively along photographic/mechanical principles. Type is composed by direct, projective exposure of a character image embedded in a negative film alphabet matrix or grid.

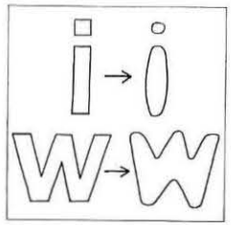
2. Machines which utilize character forms converted into electronic impulses and "written" or generated on a cathode ray tube (CRT) for photographic projection onto film or paper.

In order to explain these two principles we might use the following analogies. The first group of machines would be comparable to a movie theatre. Light is projected directly through a film strip and casts an image onto a screen. The second group could be compared to television transmission. In the television studio a picture is converted into electronic impulses which in turn are received by our antenna and converted into a picture on the tube of our receiver.



Two photo-typesetting generations: direct photographic exposure, and electronically resolved CRT character imaging.

A clear distinction between these two photo-typographic composition principles is eminently important. And a simple numerical comparison may further elucidate that difference: equipment in the first category will never exceed exposure speeds of 100,000 characters per hour, while equipment in the second category is able to attain hourly speeds from 100,000 characters on up to yet undefined limits of millions of characters.



(Left) normal character design; (right) distortion due to fast exposure.

Exposure in "classical" photo-composition machines

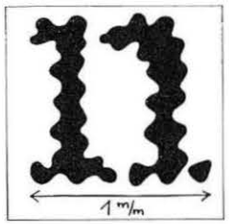
Speed is thus the important distinguishing factor between the two methods of photo-composition. Every amateur photographer is aware of the basic rule that a longer exposure results in a sharper picture. In the first group of photo-typesetting machines, the exposure speed is limited. The adjacent illustration pictures an i which has been exposed very fast. The dot has diminished in size, while the vertical stem of the letter has experienced a noticeable widening in the center. The proportion of light passing through the negative character image is related to the surface area; in other words, a small opening passes proportionately less light than a larger one. Based on this physical phenomena, the w shows a considerable swelling of the diagonally connected strokes.

From this we can deduct that "classical" photo-composition devices (those utilizing negative character images) possess definite limitations with regard to speed and quality. A proportionately exact exposure time for all parts of the letter is immensely important for qualitatively satisfactory photo-typographic reproduction.

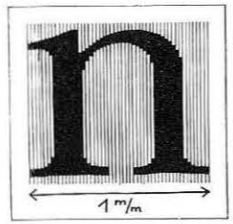
The raster of a cathode ray tube

In the new electronic character generation methods, the individual letter is no longer exposed as a whole but is resolved—depending on the particular system—into a multitude of dots or lines. Every one of those elements is generated with precisely *identical* intensity so that the reproduction of the entire character is *always faithful* to its designed form.

Today's typographers are, nevertheless, disturbed by the fact that in CRT typesetting the



6-point n broken up by 200-line halftone screen.



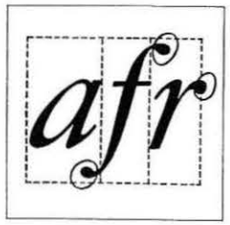
6-point n screened by vertical strokes by the Linotron 505 (512 lines per cm.).

outline of the letter is no longer entirely smooth, but subject to a stair-step, grid-pattern effect. An aversion to screened typographic characters in letterpress halftone engravings or even in roto-gravure printing is quite justified. That negative attitude, however, must not be transfered to CRT typesetting since the resolutions utilized here are *considerably* finer than the screens of ordinary halftone printing. With the addition of the normal effect of printing, the screen or resolution becomes so insignificant that it is no longer perceivable by the naked eye.

The Linotron 505, for example, works with a screening system which resolves the characters into vertical strokes. The machine offers two choices of character resolution: 650 lines-per-inch for fast, inexpensive type composition and 1300 lines-per-inch for high-quality composition.

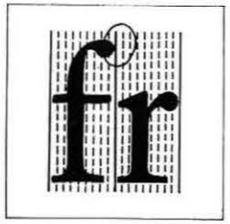
Limitations of typographic quality

The first category of photo-composition, that of relatively "slow" photo-mechanical equipment, presents practically no quality-inhibiting limitations except for those inherent in exposure-time problems mentioned earlier. In fact, this method should lead toward a constant improvement in typographic quality since photo-composition opens up possibilities which metal composition has never been able to attain: a complete liberation from the rigidity of metal, the width of the matrix, and so on.



Liberation from the rigidity of metal, achieved in "classical" photo-composition.

On the Linotron 505, italic characters are resolved into oblique lines.



The vertical character resolution of the Linotron 505 system does not permit kerning.

The following points are worth mentioning with regard to the second category, that of high-speed, cathode-ray-tube typesetting. The kerning of roman (upright) letters (for instance, an f or j) is impossible since the characters—at least on the Linotron 505—are electronically "written" with vertical strokes. Contrary to the technical limitations of the Linotype machine where kerning is impossible because of the rectangular shape of the matrices, however, the Linotron 505 permits kerning of italic type styles since those are created by means of a special electronic-optical system of obliquing the resolution lines.

III. The Future

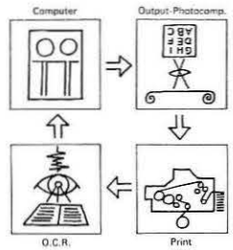
The constantly increasing need for information results in faster type composition. The configuration of text typefaces must retain international validity. Their selection and reproduction are governed by areas of application and by readership requirements. From various aspects, type and typography can be divided into two categories: (1) Texts for instant, quick information. In this category, a lower typographic quality is acceptable in favor of higher composition and printing speeds. In the future, type in this group will more and more be set as the result of computer output and, as the circle closes, be automatically read as further input by OCR (Optical Character Recognition) equipment. Typography in this category will show a tendency toward smaller type sizes. (2) Texts which, based on

their contents and length, necessitate continuous reading without discomfort even after prolonged periods of reading time. In this category, the design and reproduction quality is highly taxed, if it is to fulfil its function in an optimal way. As a rule, type sizes that tend to be larger will be employed here.

We must cope with the fact that quality and speed are almost invariably diametrically opposed to each other. Changing a 500-year-old technology is nothing less than a radical decision for a printer. Before he purchases a photo-composition machine, he has to define clearly the customer and sales structure of his firm and the kind of typography for which the equipment is to be utilized.

It is furthermore important for him to know that companies with long experience in the manufacturing of metal typefaces are handling the redesign and adaptation of typefaces for photo-composition. (In 1968 the Stempel A.G. in its modern plant in Frankfurt, Germany, began the manufacture of alphabet grids for the Linotype photo-composition systems Linofilm Super Quick and Linotron 505.)

We may confidently assume that the new typesetting technology, if it is applied understandably, will result in a rise of typographic quality levels rather than in a deterioration of typographic design. The beauty of our typography is assured for the future, although it has to be adjusted to the new technology. One may be inclined to state that our letterforms, because of the assimilation process, are becoming true expressions of the spirit of our century.



The automatic cycle—composition, printing, reading, composition, printing—has to be closed.

Translated by Klaus F. Schmidt, Vice President & Director of Print Production, Young & Rubicam, Inc., New York City.

Reading in the Medieval Monastery

Both in the Rule of St. Benedict (sixth century) and in other later monastic customs there are directions setting out how books should be read in the monastery. The Constitutions of Archbishop Lanfranc—composed before 1089—provide a good account of the arrangements for the giving out of the books to the brethren on Monday after the first Sunday in Lent: "Before the brethren go in to chapter, the librarian should have all the books save those given out for reading the previous year collected on a carpet in the chapter-house; last year's books should be carried in by those who have had them and the librarian must warn them that this is to be done, in chapter on the previous day; . . . the librarian shall then read out the list of the books which the brethren had in the previous year. When each hears his name read out he shall return the book which was given him to read, and anyone who has not read in full the book he received shall confess his fault prostrate and ask for pardon. Then the aforesaid librarian shall give to each of the brethren another book to read, and when the books have been distributed in order he shall at the same chapter write a list of the books and those who have received them." Similar directions are to be found in most monastic ordinals for men and women alike. It is improbable that the reading in monasteries was solely confined to the books solemnly given out in the way just described. This was the minimal requirement and those who had time and inclination could have access to other books. It must always be remembered that reading was not an easy matter in the Middle Ages and was often a slow business, for private reading was mumbled in a low voice.

Excerpted from "The Monastic Library" by Francis Wormald in *The Year 1200: A Background Survey, II* (New York: Metropolitan Museum of Art, 1970), 170.

An Index of the Quality of a Hyphenation Algorithm

Lindsay Molyneux

During the development of hyphenation algorithms some measure of performance is needed. A single parameter index is proposed and it is suggested that it might be used to assess hyphenation algorithms in general.

The need for hyphenation, that is the truncation of a word by a hyphen at the end of a line, arises when text is being set in type with a justified right-hand margin. In English there are no hard and fast rules as to where a hyphen may or may not be used, and the design of a computer algorithm is very much a process of trial and error. An essential part of this process is some method of judging whether a change in the algorithm leads to a better or worse performance. A simple and widely used index is often called "efficiency."[1] This is calculated by using the algorithm to hyphenate a list of words and then dividing the number of hyphens that agree with some authority (good hyphens) by the number of hyphens listed by the authority. This gives a rough measure of the quality of the algorithm but the difficulty is to know what to do about the hyphens that do not agree (bad hyphens). These can be expressed as an error, but then the trials yield two numbers, which may be difficult to interpret in that an increase in efficiency may be accompanied by a decrease in accuracy. The problem then is to express the quality of the algorithm in one parameter. The core of the solution offered here is founded on the belief that bad hyphens have a more profound effect on the typographical process than have good hyphens. This is because a bad hyphen will probably need correction whereas the lack of a good hyphen may simply lead to the spaces on some lines being greater than normal.

The Formation of the Index

The index is formed by submitting a list of words for which hyphenation points are known from an authority (*Advanced Learner's Dictionary*, for example), and then comparing the results of the algorithm with the authority list. The index is then formed as follows:

1. Each pair of hyphenations (i.e., a word hyphenated by the authority and then by the algorithm) produces a "word index."

2. The index for the algorithm is formed by taking the mean of the word index values over a sizeable sample.

3. (a) A good hyphen is defined as a hyphen from the algorithmic hyphenation that matches a hyphen in the authority hyphenation.
(b) A bad hyphen is defined as a hyphen from the algorithmic hyphenation that has no match in the authority hyphenation.
(c) If there are no bad hyphens, then the word index is positive and is formed by dividing the number of good hyphens by the total number of hyphens in the authority hyphenation.
(d) If there are some bad hyphens, then the word index is negative and is formed by dividing the number of bad hyphens by the total number of hyphens in the algorithm hyphenation.
(e) If neither the algorithm nor the authority has any hyphenation points, then the word index is NULL and the result is ignored when calculating the mean.

In the example opposite, the authority hyphenation is listed first and the hyphens are represented by dots. The algorithmic hyphenation is listed under authority word and the hyphens are indicated by dashes.

Discussion

A useful guide to the nature of the index can be had by considering the effect of two common strategies used in the design of algorithms. If a "play safe" approach is adopted that lists only those hyphens which have a high probability of being correct, then, although the errors are low, the positive values due to good hyphens are also low and the algorithm has a low index. If, on the other hand, a highly active algorithm is designed, this will only have a high index if it is accurate. It is worth noting that, although any word with a bad hyphen gives a negative contribution to the index, the value is

	Good	*Bad*	*Word Index*
DIS.TRICT			
DIS-TRICT	1	0	+1
DIS.CUS.SION			
DI-SCUS-SION	1	1	−0.5
EN.VE.LOPE			
EN-VE-LOPE	2	0	+1
HY.DRAU.LIC			
HY-DRAULIC	1	0	+0.5
MAN.U.FAC.TUR.ER			
MA-NUFAC-TUR-ER	2	1	−0.33
GRO.CER			
GROCER	0	0	0
ABROAD			
AB-ROAD	0	1	−1
PLEASE			
PLEASE			NULL

$$\text{Index for routine } \frac{2.5 - 1.83}{7} = +0{\cdot}096$$

A perfect algorithm will have an index of +1.0 while a poor routine will have a low or even negative index. Experiments suggest that an average algorithm will have an index of around +0.3 and that anything above +0.6 can be classed as good.

modified by dividing the number of bad hyphens by the total number produced by the algorithm. This is a crude way of weighting the negative results by the probability that the bad hyphen would find its way into the text.

The decision to regard words not hyphenated by either authority or algorithm as null is founded on the following reasoning. The list used for the trials will usually include words for which the authority has no hyphenation positions since, in practice, these words may well be submitted to the algorithm for hyphenation. They should be included in the test since, if the algorithm produces a hyphen, this is certainly a bad mark and must be included in the calculation of the final index. On the other hand, if it does not produce a hyphen, the score should not be taken zero since this, by increasing the number of the word count, would reduce the mean value of the index. The use of the null score has the effect of causing the algorithm to be "at risk" for all words and will penalize it if it makes a mistake.

Conclusion

A single parameter index has been proposed which was primarily devised as a tool for the development of hyphenation algorithms and is proving most useful in this work. It could, however, be used to compare the quality of routines developed in different centers, but for this purpose the principle on which it is founded and the method used in the implementation would have to gain general acceptance. It is hoped that this paper may stimulate discussion along these lines.

If the index is to be used in this way, then there is one safeguard against misleading results that should be observed. If the word list used in the test contains an unduly high proportion of words for which the authority has no hyphenation points, then (if the routine has a low activity) an unduly high index could be recorded since the null words would then be a significant proportion of the total. It is suggested therefore that the figures for any index should include the number of words used in the test and the proportion of words for which the authority had no hyphenation positions. It will be noted that these figures relate to the input to the algorithm and do not lead to an index with more than one parameter.

Dwight D. Brown[2] in the course of describing how a multiparameter index might be formed has argued that the judgement of the

performance of an algorithm should take into account the likelihood of a word being hyphenated and that the actual position of the hyphen should also be of importance. This approach could be applied to the proposed index by weighting the individual results according to his procedures.

Acknowledgement

The writer is grateful for discussions with members of the Newcastle University Computer Typesetting Research Project, particularly C. J. Duncan, Mrs. A. Petrie, and F. Sorrentino.

1. C. J. Duncan, "Why Computer Typesetting?" *Proceedings International Computer Typesetting Conference, July 1964* (London: Institute of Printing, 1965), pp. 2–19.

2. Dwight D. Brown, "Towards a Standard for Measuring the Accuracy of any Computer-hyphenation Program," *The Journal of Typographic Research*, II (July 1968), 245–258.

Flourish. Basically a pen letter with a strong admixture of the engraved letter derived from the 17th and 18th centuries.

Letterforms in the Arts: David Kindersley

This department is an international gallery for the display of artists' work (in various media) which involves the use of letterforms and related symbols. Artists, art and design schools, and other interested persons are invited to submit appropriate works and comment; communications should be addressed to the editor.

Variations on the Theme of 26.

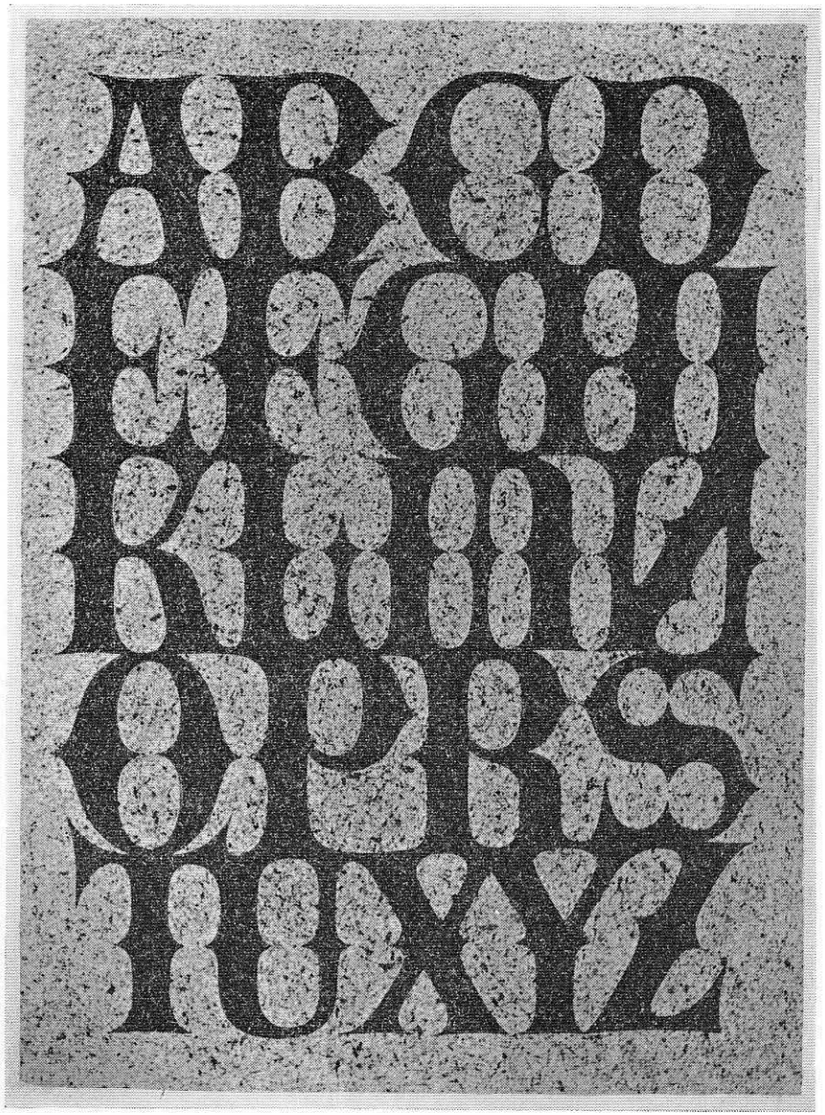
So many reasons come to mind when I am asked, why these alphabets? As pictures, they are—I suppose—abstract abstractions. As letters they show, in some cases, that less rather than more information may be required for recognition than we supposed. As an artist type-designer they represent my loathing of the arbitrary rules adhered to by type-founders and printers; rules that stem from the pen and the engineer and now hang around our necks like millstones.

Round the corner lies a new era. This can arrive only when the esotericism that shrouds the design of metal type gives way to the immediacy of film and electronics. We shall accept a variation in the style of type as we accept another literary style.

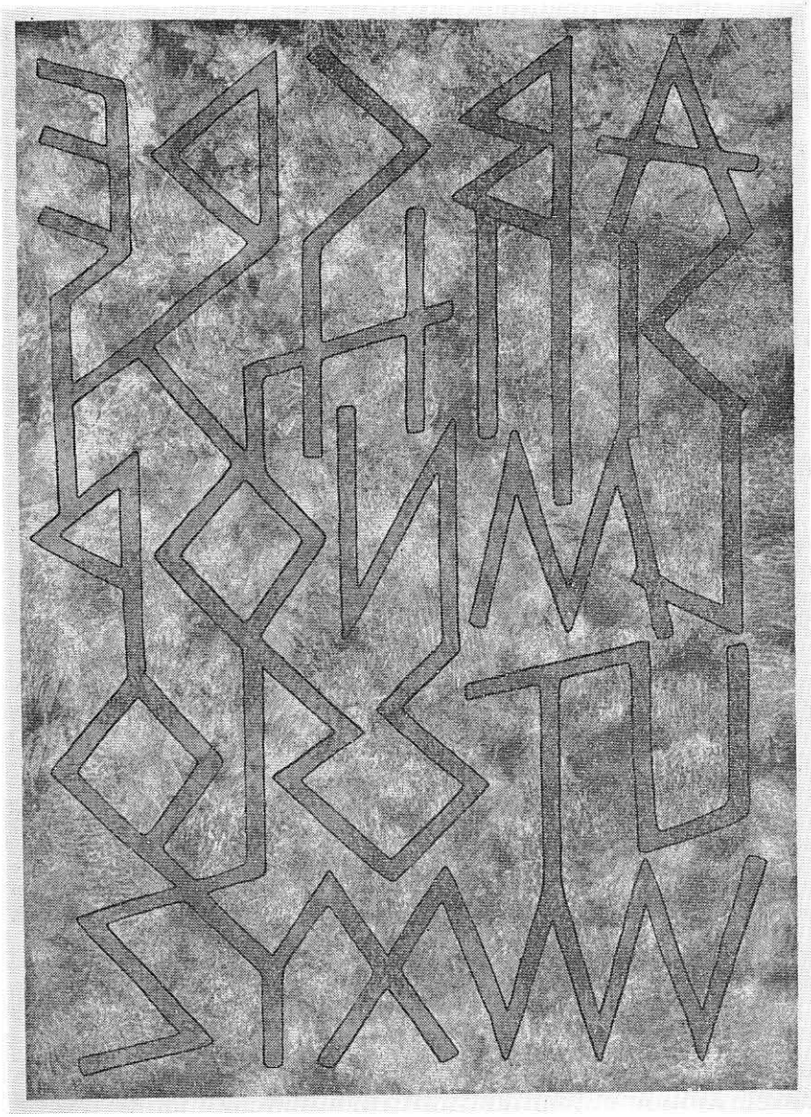
Letters are amazingly recognizable in almost any shape. It is absolutely not necessary that you should be able to trace the chisel, pen, brush, or engraver. These tools have all bound lettering at different times. The eye, brain, and hand can make the alphabet we need today.

Some of these alphabets exploit the chisel, some the pen, and all have a derivation somewhere in the history of our alphabet, but some rather less so. They are free drawn without any kind of aid, not even a measure. The pen is "felt" and the black line alone is printed—all else is hand-painted with gouache. The paper size is approximately $30'' \times 22\frac{1}{2}''$ and is hand-mould; some is hand made.

David Kindersley



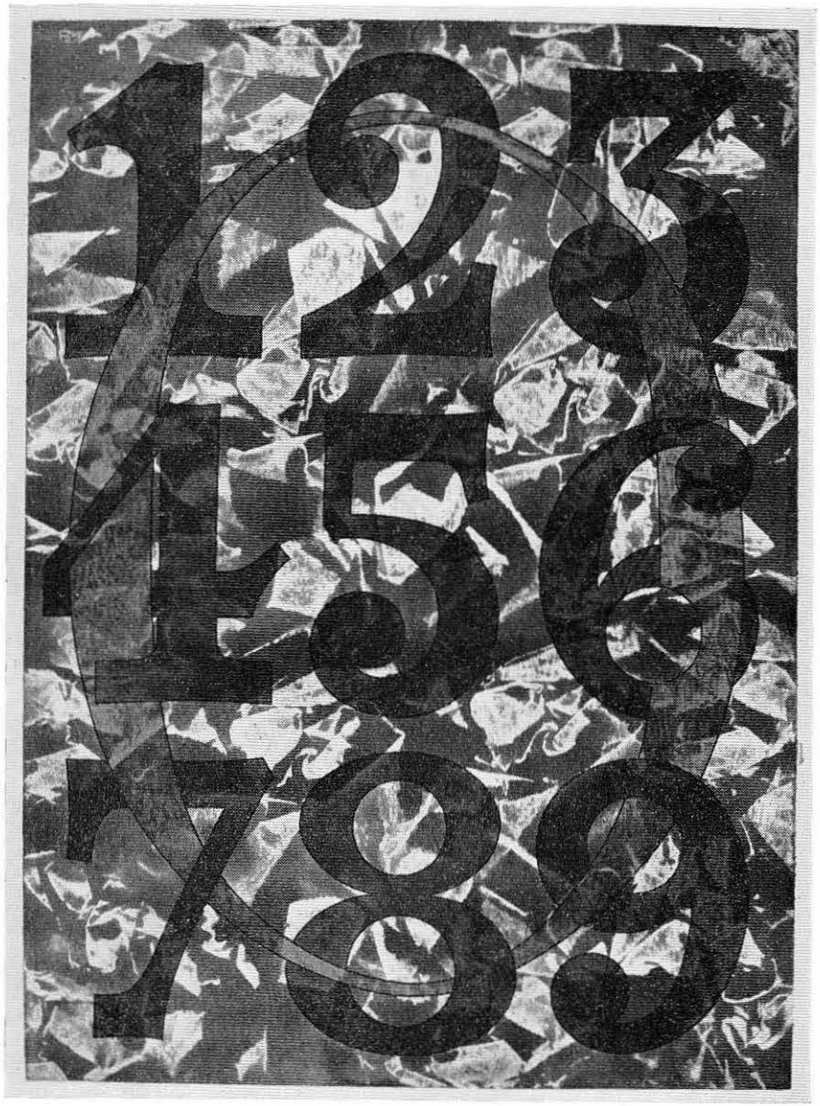
Lombardic. A form of decorated versal, sometimes seen as bronze letters let into floor stones.



Stick Boustrophedon. Based on Greek inscriptional lettering circa 500 B.C. Boustrophedon, Greek for ox-turning, is lettering written alternately from right to left and from left to right like the course of the plough.

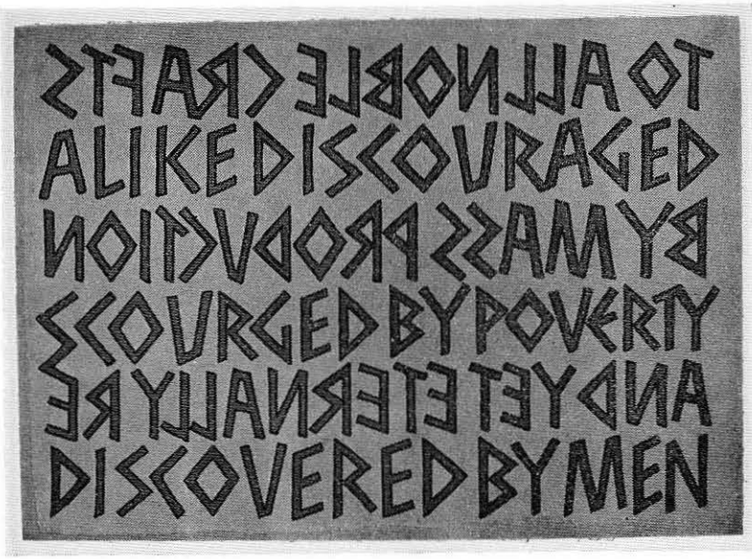
Op Alphabet.
346

English. A capital letter typifying late 18th and early 19th-century inscriptions in England.
347



Arabic Numerals.

Ligature. It has long been the practice to join letters, *viz.*, æ and œ.



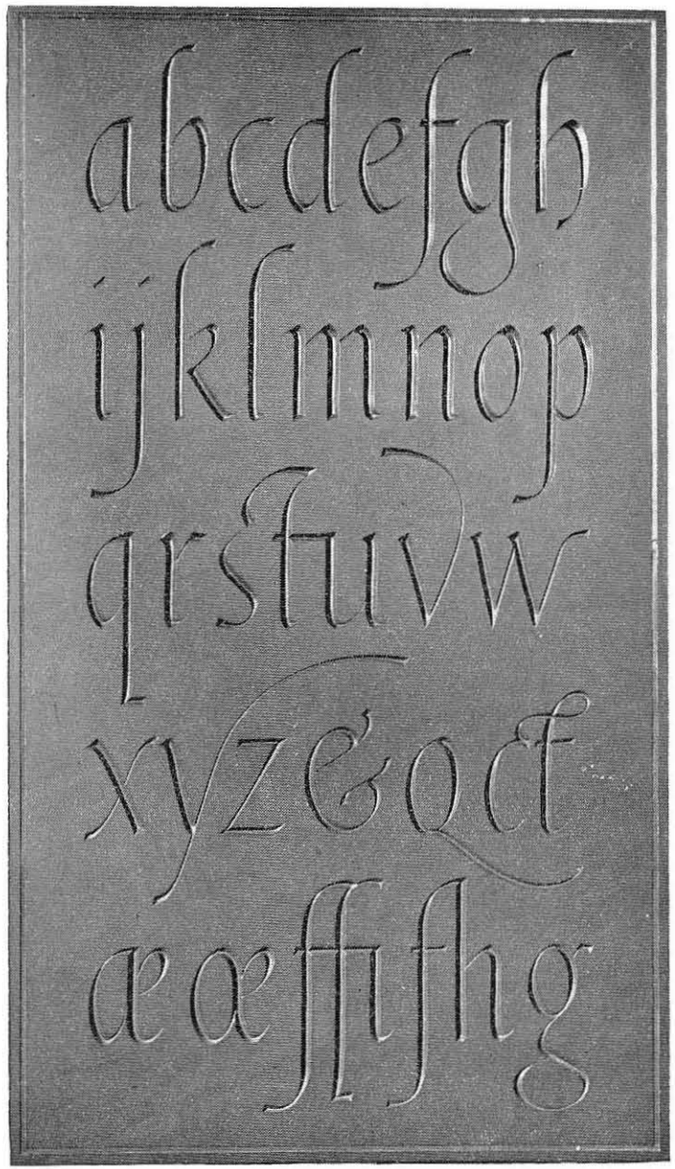
Boustrophedon Inscription. Based on Greek inscriptional lettering circa 500 B.C.

Flourished Italic. Cut in slate, 16¾ × 12 inches.

350

Guilded capitals, italics, & numerals. Cut in slate, 21 × 12 inches. Private collection of Alvin Spiro, Detroit.

351



Slate Inscription. Derived from a 16th-century writing master, letters painted red, 21 × 12 inches.

Typographic Education: Headings in Text

Peter Burnhill

A class in typography was presented with the problem of designing a system for the allocation of intervals of space on the vertical axis of the page which would determine the grouping of a given set of textual elements. A binary progression of space units was evolved. The resulting system for paragraphs interspersed with headings of first, second, and third order rank is discussed and illustrated.

Problems in Teaching Typographical Design

Course work in typographical design is conditioned by two factors which influence professional practice in this area of design. The first is that to date there has been no critical evaluation of the conventions used in the written/typographical mode of language; instead, the books tell of mock battles over essentially stylistic matters. The second factor is the absence of a recognized language for bridging the gap between a choice of conventions and the manufacturing system selected for putting the material together; an aspect of this is the absence of rational systems of measurement and of terminology.[1] The total picture is one of no theoretical basis for the study and practice of this aspect of communication. Given this situation, the study of typography, in the context of a design course, can have no fixed syllabus but must, of necessity, be the subject of a design problem of a continuing nature.

Introducing Students to Design through Typography

The need to develop a theoretical foundation for the study and practice of typographical design determines the type of problem introduced in the early stages of course work. This does not mean the divorce of work from involvement with specific tasks or from the need to come to grips with the nuts and muttons of the subject. On the contrary, only through a close examination of particulars is there an

opportunity to develop concepts which may have a more general significance and which may result in the addition of pieces to the jigsaw puzzle. The following account of a project presented to a class in visual communication design at Stafford College of Art and Design (England) may serve to illustrate.

From a teaching point of view, the aim of the project was to introduce the group to the need to establish criteria for making choices in typography and to the design of rules for assembling material by industrial processes. The task was also concerned with the continuation of work on a problem which had been begun by a previous group of new students. The project was also linked with parallel studies being followed by the group at other times during the week: this work included finding out about the typographical mensuration system through the measurement of the dimensions of type bodies with micrometers and the charting of data; the design of a range of alphanumerical signs and associated symbols for use with an on-line digital plotter; the study of aspects of mathematics which have been found to be necessary to the education of designers; and an introduction to the theory and practice of computer programming.

The work which had been begun by the previous year's group of new students and which was to be taken up and developed by the new group, had been concerned with page editing and the analysis of problems which can occur at the foot of a page or column of text when information is carried over to the head of the next page or column. A set of rules and an algorithm had been constructed as a basis for automatic decision making at these points. The rules were based on the concept that space between textual elements is functional and is not to be changed to satisfy the arbitrary convention which requires columns of text to conform to a fixed depth. In the case examined, the text had a simple structure which consisted of paragraphs interspersed with headings of one value; in this case, problems of continuity could be resolved by the use of a floating base line with an overrun tolerance of one line. The question arose as to whether the same or a similar principle could be applied to material with a more complex structure. Before this could be investigated, it was necessary to design a system for the allocation of intervals of space on the vertical axis of the page which would determine the grouping of a given set of textual elements. This was the problem to which the group of new students was asked to find an answer.

The problem, which was introduced through discussion and examined collectively, can be stated as follows: Consider a manuscript, the textual elements of which consist of paragraphs of varying length and headings of first, second, and third order rank in text. Given that all possible combinations of the elements are to appear in the work and that all lines are to range from one left-hand vertical axis; what system of spacing on this axis is required to establish a dimensional correspondence to the relations which exist between the textual elements? As the problem was concerned with the need to design a spatial system for any material containing the elements described, a text as such was not given to the group in the first instance. The task was to find a general solution to typographical problems which fall into a particular category.

It was recognized that an interval of space in typography is not merely a device for separating textual elements but also a means for bringing related elements together, and that space is associated through this dual function with both preceding and following elements in a continuous sequence of overlapping pairs. However, from the point of view of analysis and of creating rules for the automatic assembly of the text, an interval can be thought of as being attached to one or the other of a consecutive pair of elements. During discussion opinion had varied as to whether an interval should be attached "before" or "after" a given element. For the purposes of this account, the "after" case is used.

An analysis showed that the labelling of seven elements was sufficient to account for the space to be attached to all elements which could possibly occur in pairs in the context of the text described. The elements were labelled and listed as:

H1 a primary heading

H2 a secondary heading

H3 a tertiary heading

P1 a paragraph preceding H1

P2 a paragraph preceding H2

P3 a paragraph preceding H3

P4 a paragraph preceding another paragraph

With all possible elements listed, all the groups into which the elements fall sequentially could also be listed. These are:

P1 H1 H2 H3
P1 H1 H2
P1 H1
P2 H2 H3
P2 H2
P3 H3
P4

Much time was spent considering the legality of the subset H1 H3. This was ultimately rejected as linguistically illogical. (It has been suggested that the appearance of this combination in a manuscript might provide a rule for the need to consider rewriting the material.)

The next stage was to allocate dimensional values to the relations between the elements in a way which would ensure logical grouping in space.

After much discussion and the exploration of several numerical progressions, two possibilities were suggested: the sequence 1, 2, 3, 4, 5, etc.; and the binary progression 1, 2, 4, 8, etc. Of the two, the binary progression was recommended on the grounds that the growth rate is a constant one hundred per cent compared with the relative decline in the growth rate of the first sequence. It was thought that the doubling of the intervals represented by the binary development would best serve the reader's need to discern the hierarchical structure of the language at page level. It was also thought that the one-to-one relationship between the pattern of the binary notation and the order and value of the textual elements in a group might be useful in specifying material for automatic assembly.

The following table indicates the number of units of space required by the system to be set *after* each of the textual elements, together with their possible combinations and respective codings.

	Units				*Coding*			
	8	4	2	1	8	4	2	1
Groups	P1	H1	H2	H3	1	1	1	1
	P1	H1	H2		1	1	1	0
	P1	H1			1	1	0	0
		P2	H2	H3	0	1	1	1
		P2	H2		0	1	1	0
			P3	H3	0	0	1	1
				P4	0	0	0	1

Discussion of the precise value to be assigned to a unit of space on the vertical axis of the page was constrained by the following considerations:

1. That the dimension of a unit must be compatible with the mechanics of the system selected for assembling the text.

2. That the choice of unit should be such that the difference between intervals should be clearly discernible.

An obvious choice for a unit was the dimension represented by the line feed increment of the assembly system, that is, the distance between the base lines of consecutive lines of continuous text. It was argued that a unit of this dimension might be unacceptable in some classes of work in view of the amount of space required by the system, especially when the structure of the text includes three or more levels of order. To overcome this objection, it was suggested that a sub-unit of the line feed increment could be used. It was recognized that a choice would depend on both economic factors and the constraints imposed by the system of composition.

A series of specimen pages was composed and printed to illustrate the use of the spatial system in differing modes, each mode being repeated to show the inclusion of bold and italic face variants in the heading groups. The modes and variants were:

Mode 1.0: unit dimension, 12 points

1.1: using roman face only

1.2: using roman with bold face for H1

1.3: using roman with bold face for H1 and italic for H3

Mode 2.0: unit dimension, 6 points. Variants as above.

Mode 3.0: unit dimension, 3 points. Variants as above.

The type size used throughout the work was 10-point cast on a 12-point body. Each variant of each mode consisted of four pages arranged to show all six of the possible heading groups.

The use of the attributes bold and italic, and the relationship between these and the spatial system designed to create a visual correspondence to the hierarchical structure of the text, has yet to be analyzed in detail. When this has been done, it may be possible to suggest a set of rules for the correlation of the two. Meanwhile, our inclination is to put bold and italic and similar attributes into a category of necessary redundancy (in some cases). We are reasonably certain that concern for the function of space should take precedence over all other choices and that once decided in relation to a particular context, the intervals should not be subject to modification.

Conclusion

In terms of course development and our approach to teaching, the spatial system proposed by the student group is more than a necessary preliminary to the associated problem of computer-assisted page editing. Concern for the dimensions of the joints which hold typographical language in place poses problems which are different in kind from those which arise from the assumption that the relations between textual elements are a matter of the horizontal and vertical dimensions of the rectangles which may be drawn around the elements.[2] The proposal to make binary progression the mathematical basis for the functional grouping of linguistic elements will be put to the test in configurations more complex than the material used in this analysis. Textual sequences which operate on both axes of typographical space provide almost unlimited problems for staff/student investigation. The field can be extended to include visual analogues which are not necessarily alphanumeric in content.

Acknowledgement

Acknowledgement must be made to the students who did the work on the problem, especially to Deborah Hildred, Andrew Smithers, and Pat Thorley who kept notes on the progress of a discussion which extended over several weeks and of which this account is merely the bare bones arranged in a line.

1. The only organization known to the writer which is directed to an investigation of these problems as a whole is the Typographers' Computer Working Group of the Society of Industrial Artists and Designers and the Society of Typographic Designers (London); Chairman, Maurice Goldring.

2. For an interesting paper based on the assumption that typographical design is concerned with establishing relationships between the dimensions of the sides of rectangles, see "A method of quantifying order in typographical design" by Gui Bonsiepe; in this Journal, Vol. II, July 1968, and in *Ulm* No. 21, the Journal of the Ulm School of Design.

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ON THE FOLLOWING PAGES

Figures 1, 2, and 3 show three pairs of pages from the 36-page specimen book produced to illustrate the system. All of the examples have been given a one-third reduction.

Measures preserved along either flank. The uplands again are bleak grouse moors. Under the eastern slopes of the Pennines, the county is traversed from north to south by a belt of Magnesian Limestone which produces a rich soil with luxuriant vegetation.

The geography of the Dales

Coal has long been the principal product and the Yorkshire Coal Measures are worked chiefly in the southwestern part of the county.

Physical background

Introduction

From the Mesolithic period, Tardenoisian flints occur along the Pennines, notably near Huddersfield, while finds of stray Maglemose harpoons from Holderness were followed in 1949–51 by the excavation of a classic site, Star Carr, Seamer, near Scarborough, at the seaward end of the Vale of Pickering; a winter camp of hunter-fisher folk earlier than the best Maglemose sites on the continent and dated by radioactive carbon (CI4) technique about 7000 B.C. For all periods between the Neolithic and Early Iron Age B – as also for the Anglo-Saxon – evidence lies thickest in the chalk wolds. East of Bridlington have been found concentrations of fine flint implements with long and round barrows, including many of the Beaker folk. Notable Megalithic monuments elsewhere are the 20ft standing stones called the Devil's Arrows at Boroughbridge.

A great ceremonial centre is marked by three large earthen circles at Thornbrough. Cup-and-ringed-marked stones near Ilkley could belong to the Middle Bronze Age, like some of the numerous running earthworks. Arras and Hesselskew farms near Market Weighton are famous for their chariot burials of chieftains of the immediately pre-Roman Iron Age and it is significant that among other deposits of this kind, one was found in 1844 at Stanwick, where in 1951–52 Sir R.E.Mortimer Wheeler identified an 850 acre complex of earthworks as the last stronghold of the Brigantian king, Venutius, who revolted against the Romans in A.D.69.

Coal, the principal product

Associated with the Upper Coal Measures are important nodular Iron Ores. Brick, pottery and fire clay are also found, besides gannister and oil shale. Farther north, some Pennine foothills are closely pocked with the shallow pits of the old-time coal miners, who likewise worked westward at Ingleborough and eastward in the Estuarine Lias of Cleveland. Lead Ore (usually galena in calcite) was widely worked in the western dales from, perhaps, pre-Roman times until the Nevada boom in silver-lead. Many of the limestones

Figure 1. Mode 1.3: unit dimension, 12 points

Wensleydale, Nidderdale, Wharfdale and Ribblesdale, all north of Airedale (the Aire Gap), the only low-level pass through the Yorkshire Pennines and a point where the geological exposures alter. The northern massif is of Carboniferous Limestone and Yoredale Beds, capped by Millstone Grit. South of the Aire, the prominent rock is the Millstone Grit, which has been arched upwards approximately along the county boundary and has the Coal Measures preserved along either flank. The uplands again are bleak grouse moors. Under the eastern slopes of the Pennines, the county is traversed from north to south by a belt of Magnesian Limestone which produces a rich soil with luxuriant vegetation.

Early history

Building materials

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A great ceremonial centre is marked by three large earthen circles at Thornbrough. Cup-and-ringed-marked stones near Ilkley could belong to the Middle Bronze Age, like some of the numerous running earthworks. Arras and Hesselskew farms near Market Weighton are famous for their chariot burials of chieftains of the immediately pre-Roman Iron Age and it is significant that among other deposits of this kind, one was found in 1844 at Stanwick, where in 1951–52 Sir R.E.Mortimer Wheeler identified an 850 acre complex of earthworks as the last stronghold of the Brigantian king, Venutius, who revolted against the Romans in A.D.69.

Settlements

Associated with the Upper Coal Measures are important nodular Iron Ores. Brick, pottery and fire clay are also found, besides gannister and oil shale. Farther north, some Pennine foothills are closely pocked with the shallow pits of the old-time coal miners, who likewise worked westward at Ingleborough and eastward in the Estuarine Lias of Cleveland. Lead Ore (usually galena in calcite) was widely worked in the western dales from, perhaps, pre-Roman times until the Nevada boom in silver-lead. Many of the limestones

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Figure 2. Mode 2.3: unit dimension, 6 points

Wensleydale, Nidderdale, Wharfdale and Ribblesdale, all north of Airedale (the Aire Gap), the only low-level pass through the Yorkshire Pennines and a point where the geological exposures alter. The northern massif is of Carboniferous Limestone and Yoredale Beds, capped by Millstone Grit. South of the Aire, the prominent rock is the Millstone Grit, which has been arched upwards approximately along the county boundary and has the Coal Measures preserved along either flank. The uplands again are bleak grouse moors. Under the eastern slopes of the Pennines, the county is traversed from north to south by a belt of Magnesian Limestone which produces a rich soil with luxuriant vegetation.

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Physical background

Introduction

From the Mesolithic period, Tardenoisian flints occur along the Pennines, notably near Huddersfield, while finds of stray Maglemose harpoons from Holderness were followed in 1949–51 by the excavation of a classic site, Star Carr, Seamer, near Scarborough, at the seaward end of the Vale of Pickering; a winter camp of hunter-fisher folk earlier than the best Maglemose sites on the continent and dated by radioactive carbon (CI4) technique about 7000 B.C. For all periods between the Neolithic and Early Iron Age B – as also for the Anglo-Saxon – evidence lies thickest in the chalk wolds. East of Bridlington have been found concentrations of fine flint implements with long and round barrows, including many of the Beaker folk. Notable Megalithic monuments elsewhere are the 20ft standing stones called the Devil's Arrows at Boroughbridge.

A great ceremonial centre is marked by three large earthen circles at Thornbrough. Cup-and-ringed-marked stones near Ilkley could belong to the Middle Bronze Age, like some of the numerous running earthworks. Arras and Hesselskew farms near Market Weighton are famous for their chariot burials of chieftains of the immediately pre-Roman Iron Age and it is significant that among other deposits of this kind, one was found in 1844 at Stanwick, where in 1951–52 Sir R.E.Mortimer Wheeler identified an 850 acre complex of earthworks as the last stronghold of the Brigantian king, Venutius, who revolted against the Romans in A.D.69.

Coal, the principal product

Associated with the Upper Coal Measures are important nodular Iron Ores. Brick, pottery and fire clay are also found, besides gannister and oil shale. Farther north, some Pennine foothills are closely pocked with the shallow pits of the old-time coal miners, who likewise worked westward at Ingleborough and eastward in the Estuarine Lias of Cleveland. Lead Ore (usually galena in calcite) was widely worked in the western dales from, perhaps, pre-Roman times until the Nevada boom in silver-lead. Many of the limestones

Figure 3. Mode 3.3: unit dimension, 3 points. In these specimens it will be noticed that the interval between paragraphs is close to that which appears between consecutive lines of continuous text. A fully coordinated system would use the interline space as a basic unit rather than the base line to base line dimension. Unfortunately, the dimension which is arrived at by subtracting the x-height of the character set from the base line to base line dimension is not one which is included in the typographical measurement system as it stands at present. To our knowledge, the relationship between this dimension and its partner, x-height, has never been included

Wensleydale, Nidderdale, Wharfdale and Ribblesdale, all north of Airedale (the Aire Gap), the only low-level pass through the Yorkshire Pennines and a point where the geological exposures alter. The northern massif is of Carboniferous Limestone and Yoredale Beds, capped by Millstone Grit. South of the Aire, the prominent rock is the Millstone Grit, which has been arched upwards approximately along the county boundary and has the Coal Measures preserved along either flank. The uplands again are bleak grouse moors. Under the eastern slopes of the Pennines, the county is traversed from north to south by a belt of Magnesian Limestone which produces a rich soil with luxuriant vegetation.

Early history

Building materials

From the Mesolithic period, Tardenoisian flints occur along the Pennines, notably near Huddersfield, while finds of stray Maglemose harpoons from Holderness were followed in 1949–51 by the excavation of a classic site, Star Carr, Seamer, near Scarborough, at the seaward end of the Vale of Pickering; a winter camp of hunter-fisher folk earlier than the best Maglemose sites on the continent and dated by radioactive carbon (CI4) technique about 7000 B.C. For all periods between the Neolithic and Early Iron Age B – as also for the Anglo-Saxon – evidence lies thickest in the chalk wolds. East of Bridlington have been found concentrations of fine flint implements with long and round barrows, including many of the Beaker folk. Notable Megalithic monuments elsewhere are the 20ft standing stones called the Devil's Arrows at Boroughbridge.

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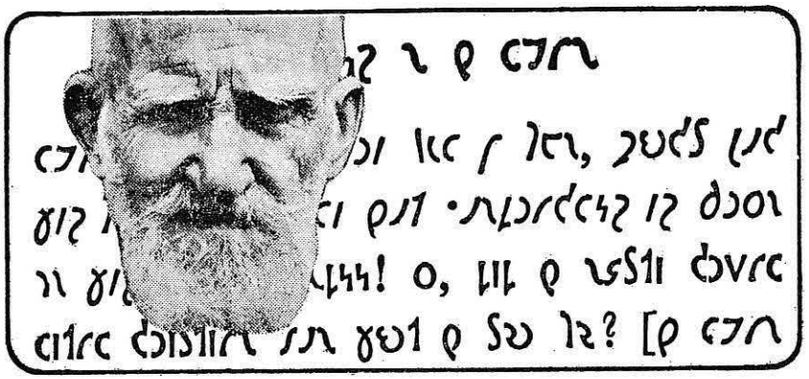
Settlements

Associated with the Upper Coal Measures are important nodular Iron Ores. Brick, pottery and fire clay are also found, besides gannister and oil shale. Farther north, some Pennine foothills are closely pocked with the shallow pits of the old-time coal miners, who likewise worked westward at Ingleborough and eastward in the Estuarine Lias of Cleveland. Lead Ore (usually galena in calcite) was widely worked in the western dales from, perhaps, pre-Roman times until the Nevada boom in silver-lead. Many of the limestones

as a constraint in the design of typefaces. It is our opinion that new faces designed for systems which are not constrained by the physical nature of three-dimensional types, should include this relationship and express it quantitatively. In designing the character set for output via a digital plotter, the student group included interline space as an integral part of the character field; both x-height and interline space could be expressed as multiples of the unit used to establish the coordinates required to store the character set in digital form in the computer.



SHAW ENOUGH. If anyone knew the English wouldn't adopt a non-Roman alphabet it must have been George Bernard Shaw, who was as Irish as ever was. But it's only now, twenty years after his death, that his alphabet idea, for which he made provisions in his will, is being laid to rest, and the Public Trustee who disposes the will is expected to announce the fade-out in a few weeks' time.

What he's expected to announce is the burden of an inquiry into the present position on the alphabet, which was prepared by the Leeds phonetics lecturer, Peter McCarthy, and actually handed in eighteen months ago. "If my report had been dramatic or epoch-making, it would have been doubtless published before," McCarthy submits. "What I'm saying is that there is nothing very much more that can be done. There isn't enough money in the kitty now to undertake any more extensive research."

As far as possible the letter of Shaw's will has been carried out, and indeed a 48-character alphabet was created, by Kingsley Read (a joint winner of a competition for which 467 entered) and duly a Shaw play, *Androcles and the Lion*, was printed in it. "People who had never seen Phoenician said it looked like Phoenician," says McCarthy. "It looks more like Siamese or Thai or Hebrew."

Has the enterprise established anything? "It sounds callous," says McCarthy, "but from a scholastic view it doesn't matter whether anything was achieved or not. Shaw's alphabet is most unlikely to be acted upon, his ideas were the most way-out of all. He detested New Spelling Reform (*aulsoe* for *also*, and *wot*, *luv*, *Tuesdae*) because he thought it was vulgar, and just tinkering."

McCarthy doesn't think spelling reform likely, and the adoption of the Shavian alphabet the most unlikely of all. "People are chary of going the whole hog. The idiosyncratic forms of English are well-loved. Pitman's i.t.a. phonetics alphabet could prepare people for a slight change. It could alter the idea that spelling is sacrosanct."

McCarthy wonders if the alphabet wasn't a Shaw joke. "With Shaw one never quite knew. The imp, the Irishman in him, made him do things with his tongue in his cheek. The wrangling, the difficulty of interpreting the will, it all helped to keep his name in the public eye for twenty years. I don't think he cared a twopenny damn whether we altered our spelling or not."

Correspondence

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

To the Editor:

We should like to draw the attention of your readers to a study group which the Working Party on Typographic Teaching has recently set up to consider the teaching of lettering. Three meetings have been held so far, and the group intends to meet informally two or three times a year in order to provide those interested in the teaching of lettering with an opportunity to exchange ideas. Some of the present members of the group are practising letterers, and all are actively engaged in teaching either its practice or its history.

We believe that it is important to focus attention on the necessity and possibilities of teaching lettering at all levels, but especially in colleges of design, in order to bring about a greater sensitivity to and understanding of letterforms generally. In particular, we should like to make the following propositions:

1. That there is a place at all levels of art and design education for the practice of lettering as pure form training and as a discipline in drawing;
2. That there is a place for the study of the history of letterforms and type design as part of the education of typographic and graphic design students, and also as a subject for postgraduate research;
3. That there is a need for research into the place of lettering in the environment, and that there is a need for letterers trained in three dimensional work and some recognized liaison with architects, engineers, and town and traffic planners;
4. That there is a need for letterers who are prepared to come to terms with industrial applications of lettering, including new methods of character assembly.

We should be glad to hear the reactions and suggestions of teachers, designers, and others interested in letterforms.

Ralph Beyer — James Mosley
Peter Burnhill — Michael Twyman
Nicolete Gray — Berthold Wolpe
(On behalf of the Study Group)

Address for correspondence: Typography Unit, The University of Reading, London Road, Reading, England RG1 5AQ

The Beatrice Warde Lecture Fund Appeal

The contribution made by the late Beatrice Warde to the art of typography was so extensive that the undersigned recommend the establishment of a permanent memorial in her name. In view of her many successes on the lecture platform, we think it appropriate to suggest the foundation of an annual Beatrice Warde lecture, and we are writing to appeal to you for donations to a fund which can be invested to provide a regular income for this purpose.

Beatrice Warde was an enthusiastic member of the governing body of the St. Bride Foundation and did much to preserve intact the Institute's famous Typographical Library, to which The Monotype Corporation's collection of her writings and lectures is to be presented. It seems fitting, therefore, that the Governors of the St. Bride Foundation should act as Trustees of the Fund, and that the Library Sub-Committee should initially be responsible for organizing the lectures. It is intended to invite each year an authority of international standing to illuminate some aspect in the field of communications, particularly with regard to printing and typography, thus not only keeping fresh the memory of Beatrice Warde but also adding to our fund of knowledge. It is hoped that the lectures will be published in permanent form both for the benefit of those not able to attend and for the benefit of posterity.

Beatrice Warde is remembered by former apprentices and students of printing and the graphic arts, by artists, calligraphers and designers, by printers and publishers, by people in advertising and public relations, for her vivid personality and eloquence. This appeal provides an opportunity to show appreciation of the work of this remarkable woman in tangible form. No gift will be considered too small, but we urge donors to respond as soon as possible so that the lectures may be started in the near future. Cheques should be made out to the "Beatrice Warde Lecture Fund" and sent to the Clerk to the Governors, St. Bride Foundation, 4 St. Bride Street, London EC4.

The Governors of the St. Bride Foundation

To the Editor:

In reading the book review of Tom Gourdie's *A Guide to Better Handwriting* I was reminded of how little information there is dealing with ordinary, every-day handwriting. Someone should do a book (maybe someone has) on the proper use of the ball-point pen and the pencil. In this day and age the use of an osmiroid pen to make Chancery script seems to me totally anachronistic.

David Ford, Senior Designer
Harvard University Press
79 Garden Street, Cambridge, Mass. 02138

Request for Information

Aaron Marcus, a consultant in computer graphics at Bell Telephone Laboratories (Murray Hill, N.J. 07974), would appreciate learning of research in the legibility of reversed (i.e., white on black) typography for both electronic displays and printed material.

Books Received

Inclusion of a publication on this list does not preclude its review in the Journal. As space permits, reviews will be printed of those publications which make special contributions to typographic/letterform research and education.

Advances in Computer Typesetting (Proceedings of the 1966 International Computer Typesetting Conference). London: Institute of Printing, 1967. xiii + 306 pages.

Advertising Research Foundation, Inc. *Proceedings of 14th Annual Conference.* New York, 1968. 68 pages (paper).

Alexander, Christopher. *Notes on the Synthesis of Form.* Cambridge: Harvard University Press, 1964. 216 pages. $6.75.

Anderson, Donald M. *The Art of Written Forms—the Theory and Practice of Calligraphy.* New York: Holt, Rinehart and Winston, 1969. ix + 358 pages. $10.95.

Anderson, Charles R. *Lettering.* New York: Van Nostrand Reinhold, 1969. 174 pages. $10.95.

Arnold, Edmund C., *Modern Newspaper Design.* New York: Harper and Row, 1969. x + 500 pages. $10.95.

Art Directors Club of New York. *The 47th Annual of Advertising, Editorial & Television Art & Design.* New York: Watson-Guptill, 1968. 507 pages. $19.50.

Bain, Eric K. *The Theory and Practice of Typographic Design.* New York: Hastings House, 1970. 182 pages. $12.50.

Battcock, Gregory, ed. *Minimal Art, A Critical Anthology.* New York: E. P. Dutton, 1968. 448 pages (paper). $3.95, in Canada $4.75.

Begbie, G. Hugh. *Seeing and the Eye.* Garden City, New York: Natural History Press, 1969. 227 pages. $5.95.

Benthul, Herman F., Edna A. Anderson, and Arlys M. Utech. *From Sounds to Words.* Morristown, N.J.: Silver Burdett, 1967. 80 pages.

Biggs, John R. *Basic Typography.* New York: Watson-Guptill, 1969. 176 pages. $8.50.

Brattinga, Pieter. *Planning for Industry, Art, and Education.* Utrecht: A. W. Bruna en Zoon, and New York: Van Nostrand Reinhold, 1970. 192 pages. $15.00.

Bruyninckx, Jozef. *Phototypography and Graphic Arts Dimension Control Photography*. Los Angeles: Ad Compositors, 1969. 155 pages.

Butcher, H. J., ed. *Educational Research in Britain*. New York: American Elsevier, 1968. 408 pages. $11.50.

Cage, John. *Notations*. New York: Something Else Press, 1969. $15.00.

Carter, Harry. *A View of Early Typography* (Up to About 1600; The Lyell Lectures 1968). London and New York: Oxford University Press, 1969. xii × 138 pages. 42s.

Catich, E. M. *The Origin of the Serif*. Davenport, Iowa: The Catfish Press, 1968. xv + 310 pages.

Chall, Jeanne S. *Learning to Read: The Great Debate*. New York: McGraw-Hill, 1967. 372 pages. $8.50.

Chao, Yuen Ren. *Language and Symbolic Systems*. New York and London: Cambridge University Press, 1968. xvi + 240 pages. $1.95 (paper).

Chejne, Anwar G. *The Arabic Language—Its Role in History*. Minneapolis: University of Minnesota Press, 1969. x + 240 pages. $6.75.

Chronik des Gutengerg-Jahres 1968. Mainz: Verlag der Gutenberg-Gesellschsft, 1969. 128 pages.

Damase, Jacques. *Revolution Typographique* (depuis Stephane Mallarme). Geneve: Galerie Motte, 1966. xxvii + 134 pages.

Davis, Alec. *Package and Print*. New York: Clarkson N. Potter, 1968. 112 pages, (plates following). $15.00.

De Wolf, John W. *Advertising Research*. New York: Association of Industrial Advertisers, 1968. 78 pages. $10.00.

Dodge, H. Robert. *Industrial Marketing*. New York: McGraw-Hill, 1970. x + 467 pages. $10.50.

Dooijes, Dick, and Pieter Brattinga. *A History of the Dutch Poster, 1890–1960*. (Introduction by H. L. C. Jaffé). Amsterdam: Scheltema & Holkema, 1968. 154 pages. Dfl. 85.

Downing, John. *Evaluating the Initial Teaching Alphabet*. London: Cassell, 1967. xiv + 327 pages.

Edwards, Elwyn. *Information Transmission*. London: Chapman and Hall, 1964. 134 pages. $2.50 (paper).

Fairbank, Alfred. *The Story of Handwriting* (Origins and Development). New York: Watson-Guptill, 1970. 108 pages. $7.95.

Fern, Alan M. *Word and Image: Posters from the Collection of the Museum of Modern Art* (selected and edited by Mildred Constantine). New York: Museum of Modern Art, 1968.

Finkelstein, Sidney. *Sense and Nonsense of McLuhan*. New York: International Publishers, 1968. 128 pages. $4.95 clothbound, $1.45 paper.

Fries, Charles C. *Linguistics and Reading*. New York: Holt, Rinehart and Winston, 1963. xxi + 265 pages. $6.95.

Garve, Andrew. *The Long Short Cut*. New York: Harper and Row, 1968. 167 pages. $4.95.

Gates, David. *Lettering for Reproduction*. New York: Watson-Guptill, 1969. 191 pages. $10.00.

Geck, Elisabeth. *Johannes Gutenberg* (Vom Bleibuchstaben zum Computer). Bad Godesberg: Inter Nationes, 1968. 132 pages (paper).

Gelb, I. J. *A Study of Writing* (rev. ed.). Chicago and London: University of Chicago Press, 1965, xix + 319 pages. $2.95 (paper), also available in clothbound.

Gerstner, Karl. *Designing Programmes*. New York: Hastings House, 1968. 112 pages. $9.50.

Glegg, Gordon L. *The Design of Design* (Cambridge Engineering Series). New York: Cambridge University Press, 1969. 93 pages. $4.95.

Gluck, Felix, ed. *Modern Publicity, 1968–1969*. New York: Viking Press, 1968. 163 pages. $14.00.

Gluck, Felix, ed. *World Graphic Design* (Fifty Years of Advertising Art). New York: Watson Guptill, 1969. 175 pages. $17.50.

Goodman, Kenneth S., ed. *The Psycholinguistic Nature of the Reading Process*. Detroit: Wayne State University Press, 1968. 347 pages. $8.95.

Goodman, Nelson. *Languages of Art—An Approach to a Theory of Symbols*. New York: Bobbs-Merrill, 1968. xiii + 277 pages. $8.00.

Gordon, Cyrus H. *Forgotten Scripts*. New York: Basic Books, 1968. xii + 175 pages. $6.95.

Gordon, George N. *The Languages of Communication: A Logical and Psychological Examination*. New York: Hastings House, 1969. xvii + 334 pages. $10.95.

Haab, Armin, and Walter Haettenschweiler, *Lettera 3*. New York: Hastings House, 1968. 128 pages.

Hardy Annual. Watford, England: Watford School of Art, 1969.

Haskins, Jack B. *How to Evaluate Mass Communications: The Controlled Field Experiment*. New York: Advertising Research Foundation, 1968. vi + 96 pages. $4.00 (paper).

Hellman, Hal, *Communications in the World of the Future*. New York: M. Evans, 1969. 192 pages. $4.95.

Hilton, Alice Mary, ed. *The Evolving Society* (Proceedings of the First Annual Conference on the Cybercultural Revolution). New York: Institute for Cybercultural Research, 1966. xiv + 410 pages.

Houck, John. *Outdoor Advertising: History and Regulation*. Notre Dame: University of Notre Dame Press, 1969. v + 256 pages. $15.00.

Huey, Edmund Burke. *The Psychology and Pedagogy of Reading* (reprint of 1908 edition). Cambridge: MIT Press, 1968. l + 469 pages. $3.95 (paper).

Hutchins, Michael. *Typographics: A Designer's Handbook of Printing Techniques*. New York: Reinhold, 1969. 96 pages. $5.50 clothbound, $2.75 paper.

Hutchison, Harold F. *The Poster—an Illustrated History from 1860*. New York: Viking Press, 1968. 216 pages, $14.00.

Hutt, Allen. *Newspaper Design* (2nd edition). London and New York: Oxford University Press, 1967. xviii + 307 pages. $10.10 or 63s.

Ivins, William M., Jr. *Prints and Visual Communication* (reprint). New York: Da Capo Press, 1969. xxv + 190 pages. $10.00.

Jensen, Hans. *Sign, Symbol and Script* (An Account of Man's Efforts to Write) (3d ed.; English trans. from German by George Unwin). London: George Allen & Unwin, and New York: G. P. Putnam's Sons, 1969. 608 pages. £5.5.0 and $17.50.

Kallir, Alfred. *Sign and Design* (The Psychogenetic Source of the Alphabet). London: James Clarke, 1961. 348 pages. 55s.

Kelly, Rob Roy. *American Wood Type 1828–1900* (Notes on the Evolution of Decorated and Large Types and Comments on Related Trades of the Period). New York: Van Nostrand Reinhold, 1969. 350 pages.

Kernan, Jerome B., William P. Dommermuth, and Montrose S. Sommers. *Promotion, An Introductory Analysis*. New York: McGraw-Hill, 1970. xvi + 367 pages. $9.95.

Kirkpatrick, C. A. *Advertising: Mass Communication in Marketing* (2nd ed.). Boston: Houghton-Mifflin, 1964. 514 pages. $8.75.

Kolers, Paul A. and Murray Eden. ed. *Recognizing Patterns, Studies in Living and Automatic Systems*. Cambridge: MIT Press, 1968. xi + 237 pages. $11.00.

Lamb, Sydney H. *The Magic of Numbers*. New York: Arc Books, 1967. 71 pages. $.95 (paper).

Lambert, Fred, ed. *Graphic Design Britain 70*. London: Studio Vista, and New York: Watson-Guptill, 1970. x + 224 pages. $17.50.

Landau, Robert A., and Judith S. Nyren, ed. *Large Type Books in Print*. New York and London: R. R. Bowker, 1970, xxi + 193 pages. $10.00 in U.S. and Canada, $11.00 elsewhere.

La psychologie moderne de A è Z. Paris: Centre d'Etude et de promotion de la Lecture, 1967. 544 pages.

Lehner, Ernest. *Symbols, Signs & Signets*. New York: Dover, 1969. xi + 221 pages. $3.50 (paper).

Licklider, J. C. R. *Libraries of the Future*. Cambridge: MIT Press, 1965. 219 pages. $6.00.

Lissitzky-Küppers, Sophie, *El Lissitzky*. (Introduction by Herbert Read). Greenwich: New York Graphic, 1968. 407 pages. $30.00.

Longyear, William. *Type and Lettering* (4th ed.). New York: Watson-Guptill. 176 pages. $6.95.

Mackay, David, Brian Thompson, and Pamela Schaub. *Breakthrough to Literacy* (Teacher's Manual). London: Longman for the Schools Council, 1970. xii + 212 pages (paper).

MacRobert, T. M. *Fine Illustrations in Western European Printed Books*. London: Her Majesty's Stationery Office, 1969. iv + 148 pages. $4.95 (paper).

Manpower, Recruitment and Education Programs in Graphic Communications. Pittsburgh: Graphic Arts Technical Foundation, 1968. vi + 90 pages (paper).

Margalit, Avi (illustrator). *The Hebrew Alphabet Book*. New York: Sabra Books, 1968. $2.95.

Massin (trans. Caroline Hillier and Vivienne Menkes). *Letter and Image*. New York: Van Nostrand Reinhold, 1970. 287 pages. $20.00.

Middleton, Michael. *Group Practice in Design*. New York: George Braziller, 1969. 303 pages. $15.00.

Moles, Abraham (trans. Joel E. Cohen). *Information Theory and Esthetic Perception*. Urbana: University of Illinois Press, 1968. xi + 221 pages. $2.45 (paper).

Moore, A. D. *Invention, Discovery, and Creativity*. New York: Doubleday, 1969, xiv + 178 pages. $4.95 clothbound, $1.45 paper.

Müller, Fridolin, ed. *Camille Graeser*. New York: Hastings House, 1968. 89 pages.

Mumford, Lewis. *The Myth of the Machine—Technics and Human Development*. New York: Harcourt, Brace, and World, 1967. 342 pages. $8.95.

Norman, Charles. *E. E. Cummings: A Biography*. New York: E. P. Dutton, 1967. viii + 246 pages. Paper: $1.45, in Canada $1.75.

Ollive, Emmanuel, ed. *Fleurons et Vignettes*. Paris: Compagnie Francaise D'Editions, 1966.

Olyanova, Nadya, *Handwriting Tells*. New York: Bobbs-Merrill, 1969. x + 371 pages. $12.50.

Ong, Walter J. *The Presence of the Word*. New Haven and London: Yale University Press, 1967. xiv + 360 pages. 63s.

Optical Character Recognition and the Years Ahead. Elmhurst, Ill.: Business Press, 1969. x + 385 pages. $15.00.

Parry, John. *The Psychology of Human Communication*. New York: American Elsevier, 1968. 248 pages. $6.00.

Pierce, John R. *Science, Art and Communication*. New York: Clarkson N. Potter, 1968. 174 pages. $6.00.

Potter, Ralph K., George A. Kopp, and Harriet Green Kopp. *Visible Speech*. New York; Dover, 1966. xiv + 439 pages. $12.50.

A Print Buyer's Guide. Slough, Eng.: Kenion Press. 12 pages.

Quattordicesima Triennale di Milano. Milano: Palazzo dell'arte al Parco, 1968. 186 pages.

Quong, Rose. *Chinese Written Characters*. New York: Cobble Hill Press, 1968. 78 pages. $5.95.

Reichardt, Jasia. *Cybernetic Serendipity* (The Computer and the Arts). London: Studio International, 1968. 104 pages. $5.00 or 35s.

Richaudeau, François. *La Lisibilitè*. Paris: Centre d'Etude et de Promotion de la Lecture, 1969. 302 pages.

Richaudeau, François. *Le Processus de Lecture*. Paris: Centre d'Etude et de Promotion de la Lecture, 1968. 61 pages.

Root, Robert. *Modern Magazine Editing*. Dubuque: Wm. C. Brown, 1966. xiv + 558 pages.

Rothenstein, Michael. *Relief Printing*. New York: Watson-Guptill, 1970. 224 pages. $15.00.

Ruppel, Aloys, ed. *Gutenberg Jahrbuch 1969*. Mainz: Gutenberg-Gesellschsft, 1969. 349 pages.

Rutherford, Phillip R. (compiled by). *A Bibliography of American Doctoral Dissertations in Linguistics*. Washington, D.C.: Centre for Applied Linguistics, 1968. iv + 139 pages (paper).

Ruzicka, Rudolph. *Studies in Type Design—Alphabets with Random Quotations*. Hanover: Friends of the Dartmouth Library, 1968.

Singh, Jagjit. *Great Ideas in Information Theory Language and Cybernetics*. New York: Dover, 1966. ix + 338 pages. $2.25 (paper).

Smith, Frank, and George A. Miller, ed. *The Genesis of Language, A Psycholinguistic Approach*. Cambridge: MIT Press, 1968. xiv + 400 pages. $2.95 (paper).

Solt, Mary Ellen, ed. *Concrete Poetry: A World View*. Bloomington and London: Indiana University Press, 1968. 311 pages. $10.95.

Sparrow, John. *Visible Words* (A Study of Inscriptions in and as Books and Works of Art), London: Cambridge University Press, 1969. xvi + 151 pages.

Spencer, Herbert, ed. *The Penrose Annual*. Volumes 62 & 63 (1969 & 1970). London: Lund Humphries, and New York: Hastings House.

Stearn, Gerald Emanuel, ed. *McLuhan Hot & Cool*. New York: Dial Press, 1967. xxii + 312 pages. $6.95.

Studi Bibliografici. Firenze: Leo S. Olschki, 1967. vii + 242 pages.

Trademarks/U.S.A. (Retrospective Exhibition of American Trademarks from 1945 to 1963). Chicago: Society of Typographic Arts, 1968. 240 pages, loose-leaf portfolio boxed.

Turnbull, Arthur T., and Russell N. Baird. *Practical Exercises in Typography, Layout, and Design*. New York: Holt, Rinehart and Winston, 1968. v + 291 pages. $4.50 (paper).

Twyman, Michael. *Lithography 1800–1850* (The techniques of drawing on stone in England and France. and their application in works of topography). London: Oxford University Press. 1970. xxi + 302 pages + plates. $16.75 or £6 net.

Ullman, Berthold Louis. *Ancient Writing and Its Influence*. Cambridge: MIT Press, 1969. xviii + 240 pages, $2.45 (paper).

de Vries, Leonard. *Victorian Advertisements*. Philadelphia and New York: J. B. Lippincott, 1968. 136 pages. $8.95.

Wagner, Geoffrey. *On the Wisdom of Words*. Princeton: D. Van Nostrand, 1968. vi + 345 pages. $6.95.

Wakankar, L. S. *Ganesh-Vidys The Traditional Indian Approach to Phonetic Writing*. Bombay: Tata Press, 1969. 15 pages (paper).

Watkinson, Ray. *William Morris as Designer*. Reinhold, 1967. 69 pages of text, 90 illus. $16.50.

Whalley, Joyce Irene. *English Handwriting 1540–1853*. London: Her Majesty's Stationery Office, 1969, xxiii + 92 pages. £5 net.

Wieger, L. *Chinese Characters*. New York: Paragon Book, and Dover, 1965. 820 pages. $4.00 (paper).

Wiener, Joel H. *A Descriptive Finding List of Unstamped British Periodicals 1830–1836*. London: Bibliographical Society, 1970. xiv + 74 pages.

Willberg, Hans Peter, ed. *Schrift im Bauhaus Die Futura von Paul Renner*. Neu-Isenburg, Germany: Verlag Wolfgang Tiesson, 1969.

Williams, Clarence M. and John L. Debes, ed. *Proceedings of the First National Conference on Visual Literacy*. New York: Pitman, 1970. xiv + 295 pages (paper).

Wingler, Hans M. (trans. Gerald Onn). *Graphic Work from the Bauhaus*. Greenwich: New York Graphic, 1969. 168 pages. $12.50.

Wolfenstine, Manfred R. *The Manual of Brands and Marks*. Norman: University of Oklahoma Press, 1970. xxix + 434 pages. $9.95.

Zapf, Hermann. *Manuale Typographicum*. Frankfurt: Z-Press; and New York: Museum Books, 1968. viii + 238 pages.

Books for Review

Publishers should send books and other materials for review in *The Journal of Typographic Research* to either of two addresses:

Europe—M. Fernand Baudin, c/o *Journal of Typographic Research*, 64 rue du Village, Bonlez par Grez-Doiceau, Belgium.

All other publishers—Editor, *Journal of Typographic Research*, c/o The Cleveland Museum of Art, Cleveland, Ohio, USA 44106.

Résumé de Articles

Traduction: Fernand Baudin

Quelques composantes psycholinguistiques des notions de "literacy" et d'alphabétisation *par John Mountford*

En anglais, *literacy* est une expression dont se servent les linguistes pour qualifier l'habileté relative des individus à se servir d'une langue sous sa forme écrite. Elle se mesure en fonction des programmes d'études imposés dans une langue donnée. En français, *alphabétisation* distingue mieux ce que l'on appelle communément enseignement de l'écriture dans le primaire. L'auteur relève cinq composantes: la connaissance de la langue; la connaissance de son orthographe (en tant que distincte de tout autre système d'écriture); des "notions techniques" de lecture; des "habitudes" de lecture; une connaissance pratique élémentaire de la lecture et de l'écriture. *Literacy* se dit aussi en parlant de sociétés. Dans leurs travaux, les linguistes en ont négligé l'aspect psycholinguistique aussi bien que l'aspect sociolinguistique; tout comme les théoriciens de l'éducation ont négligé d'approfondir la notion même d'alphabétisation.

L'apparition de l'écriture gothique *par Léonard E. Boyle*

Vers le milieu du XIe siècle, la Caroline subit d'importantes modifications. Le marché des manuscrits, tant savants que populaires, était en pleine expansion. Il exigeait une écriture réduite, claire; beaucoup d'abréviations. L'écriture gothique répondait au besoin de compression, par ex. en fondant les courbes contigües de deux lettres voisines; et aussi par d'habiles abréviations. Les illustrations montrent les étapes de cette évolution.

Quelques réflexions à propos des signes diacritiques *par Louis Marck*

Les signes diacritiques sont des symboles qui entrent dans l'orthographe officielle de plusieurs langues. Tels sont: ´ ` ^ ˇ ¨ ~ Des exemples empruntés à des ouvrages de références, à des périodiques et à des manuels typographiques illustrent à quel point l'usage américain est, à cet égard, capricieux. Les critiques visent plus particulièrement les imprimés, car ils trahissent une incapacité à reproduire, par exemple, les mots allemands, tchèques et polonais, telle, que même les polyglotes ne peuvent en deviner la prononciation.
Quelques aspects particuliers: mise en mémoire, récupération, dactylographie, sont également abordés. L'auteur demande qu'une plus grande attention soit accordée à ces questions et que l'on se mette internationalement d'accord sur un usage plus strict, ou bien, au contraire, sur l'abandon pur et simple de tous les signes diacritiques.

Les caractères pour la photocomposition *par Adrian Frutiger*

Le flot montant des informations impose une typographie superlativement efficace et confortable à la lecture. On peut discerner une tendance universelle à réduire le nombre des styles de caractères de labeur et à augmenter l'oeil des caractères pour la lecture soutenue. Car il faut distinguer ce qui est destiné à une lecture soutenue et ce qui est destiné à une lecture discontinue. L'auteur compare les deux systèmes fondamentaux de photocomposition: par projection photographique et par tube cathodique.

Pour mesurer la valeur d'un système de coupures *par Lindsay Molyneux.*

Lorsqu'on met au point un système, un algorithme, pour les coupures, il est bon d'avoir un critère de rendement. C'est ce qui est proposé sous la forme d'un index à paramètre unique. Cet index serait universellement utilisable dans tous les problèmes de coupures.

Formation typographique: les sous-titres dans le texte *par Peter Burnhill*

Il s'agit d'un exercice qui fut proposé à une classe de typographie: trouver un système de blancs suivant l'axe vertical des pages qui traduise visuellement la hiérarchie des divers éléments d'un texte donné. La solution présentée et illustrée est une unité de blanc avec progressions binaires. Il en résulte des paragraphes, coupés de sous-titres du premier, du second et du troisième ordre.

Kurzfassung der Beiträge

Übersetzung : Dirk Wendt

Einige psycholinguistische Aspekte des Anfänger-Grundlesevermögens *von John Mountford*

Lesevermögen ist ein linguistischer Fachausdruck, der sich auf Individuen bezieht. Es bedeutet die Fähigkeit, Sprache in geschriebener Form zu benutzen. Grundlesevermögen ist die besondere Art Lesevermögen, die von Ausbildungs systemen gefordert wird, nämlich Lesevermögen in einer Grundsprache. Anfänger-Grundlesevermögen ist ein angemessenerer Ausdruck für das, was gewöhnlich durch Lesen-Lernen erreicht wird. Fünf psycholinguistische Komponenten werden vorgeschlagen: Kenntnis einer Grundsprache, Kenntnis deren Standard-Orthographie (im Unterschied zu anderen Schrift-Systemen), technische Begriffe, Gewohnheiten und grundlegende handwerkliche Erfahrungen im Schriftgebrauch (Lesen und Schreiben). Lesevermögen (als allgemeiner Bildungsstand) wird auch ganzen Gesellschaftsschichten oder Kulturen zugesprochen. Die Linguistik hat dieses im allgemeinen bisher nicht näher untersucht, weder als psycholinguistische noch als soziolinguistische Erscheinung, ebenso wie die Bildungstheorie den Begriff des Lesevermögens ausgelassen hat.

Die Entstehung der gothischen Handschrift *von Leonard E. Boyle*

Um die Mitte des elften Jahrhunderts begann man, die karolingische Schrift bedeutenden Veränderungen zu unterwerfen. Der wachsende Markt für Geschriebenes, sowohl akademischen wie populären Inhalts, erforderte einen engen, klaren und hochgradig abgekürzten Schreibstil. Die neue gothische Schrift entstand aus diesem Bedürfnis nach Verengung, z.B. verschmolzen die einander gegenüberliegenden Linien von Buchstaben, die Rücken an Rücken standen, und es wurden angemessene Abkürzungen benutzt. Die Übergangs-Stilarten der Handschrift werden gezeigt.

Einige Gedanken über den Gebrauch und Mißbrauch von Akzenten *von Louis Marck*

Die hier besprochenen Akzente sind Symbole, die Teil der offiziellen Rechtschreibung zahlreicher Sprachen sind, wie ´ ` ^ ˇ ¨ ~, u.s.w. Die Unsicherheit und Ungenauigkeit in ihrer Anwendung oder Nicht-Anwendung in der gegenwärtigen amerikanischen Praxis wird an Beispielen aus Literaturberichten, stilisierten Büchern und Zeitschriftenliteratur demonstriert. Besonders kritisiert wird die Unfähigkeit der Druckwerke, Namen aus Sprachen wie Deutsch, Tschechisch und Polnisch wierderzugeben, sodaß selbst Kenner dieser Sprachen nicht über ihre Aussprache informiert werden. Probleme des Speicherns und Auffindens von Information sowie der Konstruktion von Schreibmaschinen werden angesprochen. Schließlich wird für bessere Kenntnis und internationale Anerkennung der Akzente plädiert. Die Alternative dazu wäre ihre international abgestimmte allmähliche Abschaffung.

Buchstabenformen im Lichtsatz *von Adrian Frutiger*

Der beschleunigte Fluß der Information in der heutigen Welt macht es erforderlich, daß unsere Typographie maximal brauchbar und bequem für den Leser wird. Es besteht eine Tendenz zum universellen Gebrauch von weniger Brotschriften und größeren Schriftgraden. Man muß unterscheiden zwischen Material, das für fließendes Lesen, und solchem, das für Nachschlagewerke entworfen ist. Die beiden grundlegenden Lichtsatz-Erzeugungssysteme—Belichtung durch ein optisches System und auf einem Kathodenstrahl-Bildschirm—werden verglichen.

Ein Kennwert für die Güte von Worttrennungs-Algorithmen *von Lindsay Molyneux*

Bei der Entwicklung von Worttrennungs-Algorithmen benötigt man ein Maß für die Güte ihrer Arbeitsweise. Es wird ein ein-parametriger Kennwert vorgeschlagen. der allgemein zur Bewertung von Worttrennungs-Algorithmen benutzt werden kann.

Typographische Ausbildung : Zwischenüberschriften *von Peter Burnhill*

Einer Typographie-Klasse wurde die Aufgabe gestellt, ein System zur Anordnung von Zwischenräumen in der Vertikalen einer Seite zu entwerfen, das eine Gruppierung für einen gegebenen Satz struktureller Elemente festlegen sollte. Es wurden Zwischenraum-Einheiten mit binärer Progression entwickelt. Das resultierende System für Absätze mit dazwischengestreuten Überschriften erster, zweiter und dritter Ordnung wird besprochen und gezeigt.

The Authors

John Mountford teaches at La Sainte Union College of Education (Southampton, England). After studying both applied and general linguistics at the University of Edinburgh, he spent three years with the Reading Research Unit of London University's Institute of Education. He has lectured and published on writing, on the linguistic aspects of i.t.a., and on the wider aspects of literacy. He describes his present preoccupation as "understanding literacy."

Leonard E. Boyle is professor of Latin palaeography at the Institute of Mediaeval Studies (59 Queen's Park, Toronto 5, Canada). A Fellow of the Royal Historical Society, Dr. Boyle is the author of various articles on medieval palaeography, canon law, and university history.

Louis Marck is assistant professor in the Department of Modern Languages, Polytechnic Institute of Brooklyn (333 Jay Street, Brooklyn, N.Y. 11201). He received his doctorate in linguistics from New York University and for several years taught at Adelphi University under the aegis of the late Dr. Siegfried H. Muller, who had developed the concept of visual identification of the world's languages. Dr. Marck's published articles deal with metanalysis and with the use of minimal pairs in the teaching of German.

Adrian Frutiger (23 Villa Moderne, Arcueil, Seine, France) is a type designer. He started his own studio at Paris in 1961. He has lectured widely on advanced typography and has worked on the adaptation of traditional typographical methods and typefaces to new electronic media.

Lindsay Molyneux is a senior lecturer in electronics in the School of Physics at the University of Newcastle upon Tyne (Newcastle upon Tyne NE1 7RU, England). About six years ago he became interested in using computers to solve some of the problems of automatic composition. While his main interest is how the incorporation of minimal-size digital computers into other types of machinery, he maintains an interest in program writing, particularly the development of small-size hyphenation programs.

David Kindersley (Chesterton Tower, Chapel Street, Cambridge, England) is a designer of letters for many media—calligraphic posters to street-name alphabets. A pupil of Eric Gill, he is best known for his stone cutting and, most recently, his invention of the Optical Letter Spacer.

Peter Burnhill is head of the Department of Visual Communication Design at Stafford College of Art and Design (The Oval, Stafford, England). He is a member of the Typographers' Computer Working Group of the SIAD and the STD, and chairman of Study Panel Four of the Group, which is concerned with the rationalization of typographical conventions and terminology. He is also a member of the Steering Committee of the independent Working Party on Typographic Teaching.

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Index to Volume IV

TITLE INDEX

AUTHOR INDEX

BOOK REVIEW INDEX

NOTE

Readers interested in securing copies of any of the articles listed above should send for the appropriate number of the *Journal*:

Pages 1 through 96 are in the Winter number

Pages 97 through 192 are in the Spring number

Pages 193 through 288 are in the Summer number

Pages 289 through 384 are in the Autumn number

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