

VISIBLE LANGUAGE

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A Taxonomy of Alphabets and Scripts

Earl M. Herrick

This paper describes a taxonomy or system of classification to describe alphabets and to show the various degrees of formal similarity which they bear to one another. The principles of this taxonomy, largely borrowed from the biological sciences, are briefly stated; three taxonomic levels, corresponding to three degrees of similarity, are then defined. For each level, the paper describes the kinds and degrees of similarity which alphabets must have to be included within one taxon; these similarities are illustrated by several different kinds of taxa and some of the alphabets which belong to them. Several problems in the comparison of writing systems which will require further research are mentioned.

Linguists, typographers, and others who work with written language do not presently have any adequate system of classification for describing similarities and differences among the alphabets and scripts which are used to write languages. This paper will describe one method by which such a taxonomy or classification system may be constructed, and it will offer an outline of such a taxonomy.

A linguistic taxonomy of this kind should be helpful in several ways to all those who study and work with written languages.¹ It will allow the description of any alphabet—more or less accurately, as may be desired—by naming the script or another of the taxa (i.e., groupings in the taxonomy) to which it belongs. It will also allow the similarity between any two alphabets to be described by naming the lowest taxon (i.e., the smallest grouping) to which they both belong. The writing of a taxonomy such as this will also help to develop terminology which may be useful in the further study of written language.

1. The terms “written language,” “writing,” and “written form” of a language, as they are used in this paper, refer to written rather than to spoken language and to printing rather than to handwriting. In terms of the distinctions made by Mountford (1968), this paper deals with “writing-1” but does not deal with “writing-3.”

Because many descriptions of written languages have already been published, it may seem strange that no scientific taxonomy of alphabets and scripts has yet been constructed. It happens, however, that all previous treatments of written language have been directed to other purposes.

Some works, such as those of Diringer (1968) and Jensen (1969), are filled with examples of texts and scripts intended to show the historical development of written language; unfortunately, they have not organized their examples in any systematic, scientific manner. Other works, like that of Giljarevskij and Grivnin (1964), list alphabets from many parts of the world, but do not systematically describe the internal organization of these alphabets, their relationships to one another, or their relationships to the rest of their respective languages. Trager (1972) has developed a system of linguistic terminology for describing various kinds of relationships between speech and writing. The many illustrations of alphabets and other writing systems which he includes are generally arranged to show the similarities and relationships among them. Gelb (1963) has developed a general linguistic theory of written language which will surely serve as the basis for all future scientific work in this field. Gelb's interest, however, is in theory rather than in description, and he does not try to describe, except incidentally, the structure and functioning of individual present-day writing systems.

There are also certain works which are ostensibly general classifications of alphabets, but which are seen on closer inspection to be only classifications of roman typefaces. An example is the *Klassifikation der Schriften* published by the Deutsche Industrie Normenausschuss (DIN 16 518).² This taxonomy starts out by lumping together all non-roman writing, and then proceeds to describe and subclassify roman typefaces. Although this taxonomy might be used to describe these roman typefaces³ after that category has been defined by a more inclusive taxonomy,⁴ it cannot serve as a general taxonomy of alphabets.

2. See Noordzij (1970) for a description of this classification.

3. Although Noordzij casts doubt on its usefulness even for this purpose.

4. Previous writers on scripts and alphabets have often failed to agree on just what the roman script or alphabet is: see Tanselle (1967) on the problem of putting the

Certain other descriptions of alphabets are typified by the work of Downie (1963). This is essentially a typefounder's specimen book. It is designed to tell a printer the languages which can be printed with the types available from its publisher, it gives him the catalog information which he needs in order to buy fonts for each language, and (for some languages) it warns him of unusual letters for which he must have types or matrices before printing in them. Although Downie supplies short commentaries on each script for which Monotype makes matrices, his remarks are sometimes tantalizingly incomplete.⁵ And although he mentions that certain alphabets are related to certain others, he does not try to describe their relationships systematically.

Principles for a Linguistic Taxonomy

A scientific taxonomy such as this one should have five characteristics.

1. The taxonomy should be *useful*. On the need for this, John Stuart Mill has written, "There is no property of objects which may not be taken, if we please, as the foundation for a classification or mental grouping of those objects. . . . [However,] the ends of scientific classification are answered when the objects are formed into groups respecting which a greater number of general propositions can be made, and those propositions more important, than could be made respecting any other groups into which the same things could be distributed. . . . The test of [the] scientific character [of a classification] is the number and importance of the properties which can be asserted in common of all objects included in the group" (Mill, 1881, pp. 498-499).
2. The taxonomy should be *exhaustive*. It should attempt to treat with equal precision all branches of the field which it claims to classify—

term "italic" into the same taxonomy as the terms "roman" and "latin"; Noordzij (1970) on the relationship between fraktur and roman; Gill (1951), who avers that English uses three roman alphabets, some of which share certain letter shapes; and Hoch (1968), who says that English uses "at least two if not three distinct roman alphabets together." The author has therefore avoided the term "roman" in the present paper, and has defined and used instead the terms "neoroman" and "romanoid."

5. See, for example, his discussion of Hebrew vowel points (pp. 7-8).

the smaller branches along with the larger, the obscure branches along with the more familiar. Some of these branches may be more complex than others and may require finer subclassification. Other branches may be poorly known, and the taxonomist may have to say that his work on them is tentative and that their satisfactory treatment awaits further research. But a taxonomist should not claim to have classified an entire field when he has, in fact, classified only a part of it.

3. The taxonomy should be *hierarchical* (or *graduated*, as Tanselle [1967] has used that term). Alphabets, like all parts of language, are immensely variable, and two alphabets may show any degree of similarity from virtual identity to utter dissimilarity. In order to be useful, a taxonomy of alphabets should therefore be able to describe many different degrees of similarity. A one-level taxonomy, in which two different alphabets either do or do not belong to the same taxon, cannot do this. The taxonomy must have several levels, so that alphabets which are more closely related can be placed together in a lower taxon, while those which are less closely related can be placed together only in a higher taxon.

4. The taxonomy should be *precise*. Its several taxa should be described so well that any individual—in the present taxonomy, any alphabet—can be placed in its proper taxa.

5. The taxonomy should be *tolerant* of unforeseen variation. Although a taxonomy such as this must be precise, it cannot achieve its precision by using rigidly defined criteria. Systems of writing—like all linguistic phenomena—are too diverse to be fitted into any absolute system of categories. Even if a linguist were to devise a system of rigid criteria which would successfully classify all the writing systems that he knew, he would have no reason to believe that the next writing system which he met could be classified successfully into the same categories by the same criteria. For a taxonomy to be both tolerant of such unforeseen variation and precise enough to be useful, it must be based not on rigid criteria but on the considered judgement of those who have developed it and are familiar with its material. A taxonomy such as this should therefore simply state that certain alphabets or certain scripts are similar enough to form a taxon of a certain level. Any other script which is as much like the scripts of one taxon as they are like one another will also be placed in that taxon.

Scripts which show a like degree of similarity to one another but not to those of a taxon already established will be placed in another taxon of the same level. In this kind of taxonomy, therefore, the similarity between scripts which is necessary for membership in the same taxon should not be a stated similarity on certain stated points, but should be a degree of general similarity implied by the mutual similarities of those alphabets and scripts which are already classified together into taxa.

Linguistics is not alone in its need to describe phenomena which show great, unforeseeable variation. It shares this need with all the other sciences which have to do with living things—the biological sciences and the social sciences. In this respect, these sciences are unlike the physical sciences in which, for example, Mendeleev's classification of the chemical elements has its immense value precisely because it is so very rigid. The author has therefore borrowed for this taxonomy of alphabets and scripts several ideas from botanical and zoological taxonomies. Those taxonomies have problems and uncertainties which are much like those of the taxonomy presented here. But biology, which has been evolving its modern taxonomies for more than two centuries, has found useful solutions for some of these problems; and even its unsettled problems have led to discussion which may help clarify similar problems in linguistic taxonomies.⁶

Alphabets and Scripts

One distinction which must be made by any adequate description of written language is the distinction between an alphabet and the

6. One difficulty which linguistic and biological taxonomists share is an occasional difficulty in defining the basic groups of individuals which they should classify. For linguists these groups are speakers of "languages"; for biologists they are members of "species." These groups of individuals are often defined in roughly equivalent ways—languages by the possibility of mutual understanding among neighboring speakers; species by the possibility of fertile interbreeding among neighboring individuals. But compare Hockett (1958, pp. 323–325) on the linguistic difficulty of distinguishing the French and Italian languages because the inhabitants of some Alpine villages can understand the undoubtedly French and undoubtedly Italian speech of their neighbors on either side, and de Laubenfels (1952) on the biological difficulty of distinguishing yellow-bellied and red-bellied sapsuckers because these two kinds of birds interbreed and hybridize in a small area in Oregon.

script to which it belongs. An alphabet is part of one language; an alphabet has a definite, complex internal structure; an alphabet has close relationships with certain other parts of its language. On the other hand, a script does not necessarily belong to any one language; a script has much less internal structure than an alphabet; a script has no direct relationships with the other parts of any language.

The *alphabet* of a language is made up of graphemes, which are abstract linguistic units of written language. Most of the graphemes of an alphabet are letters, but an alphabet may also have supra-segmental graphemes—e.g., the graphemes of capitalization or the graphemes of stress, such as the diacritic grapheme “accent” in Spanish and in Czech.

Each letter of an alphabet has five characteristics.

1. A letter has a name. This means that whenever a written mark is an embodiment of a letter of a certain language, any normal literate of that language can name the letter which it embodies.
2. A letter has a pronunciation; i.e., it has certain correspondences with linguistic units in the spoken form of its language. The complexity of these correspondences varies from one language to another and from one letter to another within a language. For example, the letters of Finnish all have simple, regular correspondences with the phonemes of spoken Finnish, while many letters of English and Thai have awkward or irregular correspondences with the phonemes of their respective languages (Hanna, et al., 1966; Haas, 1956).
3. A letter has a place in the alphabetical order of its language. This means that normal literates who are given a group of written words (or other strings of characters that embody letters) can arrange them according to this alphabetical order.
4. A letter, and every other grapheme, has a certain role in the graphotactics of its language. Each language has graphotactic formulas which state the combinations of graphemes which may occur in that language. The graphotactic formulas of a language are peculiar to it and are sometimes highly characteristic of it; for example, Polish words may contain the letter sequence *szcz*, but English words do not contain that sequence unless they are unassimilated borrowings from Polish.⁷

5. A letter is embodied by marks which have a certain basic shape or a certain few basic shapes. The basic shape of a character is itself an abstract linguistic unit; it is the group of geometrical distinctive features which a written mark must have so that a literate person will recognize it as an embodiment of a certain letter.⁸ These basic shapes are what Goudy has called the “fundamental forms” (1940, pp. 28–29) or “intrinsic shapes” (1942, pp. 86, 90) of letters. It is to such a basic shape, and the way it remains invariant under stylistic and suprasegmental changes, that Gill (1951) referred when he said that “a Roman Capital A does not cease to be a Roman Capital A because it is sloped backwards or forwards, because it is made thicker or thinner, or because serifs are added or omitted.”

When a letter can be represented by more than one basic shape, the choice of shape to be used may depend on the suprasegmental graphemes that are being represented along with the letter. For example, the English letter a uses the basic shape **A** when it is embodied together with either of the suprasegmental graphemes “capitals” or “small capitals.” If it is not capitalized, it may be represented by either of the basic shapes **a** or **α**, but the latter shape is considered typical of the suprasegmental grapheme “italics.” In many languages there are letter graphemes which have alternative basic shapes conditioned by other segmental graphemes.⁹ For example, the modern Greek letter Σ (if it is not capitalized) is represented by the basic shape σ when it occurs at the end of a word and by the basic shape σ when it occurs in any other position.

7. In the graphotactic formulas, in the phoneme-grapheme correspondences, and in the alphabetical order of a language the letters of its alphabet usually act as separate units. There are, however, many exceptions to this generalization, and a thorough comparative study of written languages would have to deal with cases in which several letters act together as single units for some of these purposes.

8. In Herrick (*forthcoming*) a basic shape is called a “graphemic sign” and a geometrical distinctive feature is called a “graphon.”

9. The f-ligatures of English (ff fi fl ffi fll) are embodiments of neighboring letters which condition each other’s embodiment. For lack of space, the present paper has not thoroughly described the ligatures for each language, although the way in which the alphabets of a taxon form their ligatures is often a point of similarity among them.

A *script*, like an alphabet, is made up of graphemes. Most of its graphemes, like those of an alphabet, are letters, although it may also have suprasegmental graphemes. A script has graphotactic formulas which specify merely the ways in which its letters and suprasegmentals may co-occur. For each set of co-occurring graphemes the script specifies the basic shape and the other features of the character which will embody them. A script has no other internal organization or external relationships of its own. It has no tactic formulas to specify how its letters may follow one another. Its letters have no pronunciations, and they have no alphabetical order.

It happens, however, that in the minds of many people some letters of a script may have expected pronunciations and expected orderings. These expectations are suggested to them by the alphabets which they know and which belong to the script. For example, in the script to which the English alphabet belongs, the letter a will often be thought of as the first letter of the script, and it will often be thought of as corresponding to a low vowel phoneme, because these facts are true of the letter a in most of the alphabets of this script.

Criteria for This Taxonomy

Three kinds of alphabetical similarity have been used as the criteria for constructing this taxonomy:

1. Similarity in the basic shapes of letters.
2. Similarity in the correspondences between letters and phonemes.
3. Similarity in the alphabetical orders of letters.

There are other ways in which written languages may be similar. Some of these kinds of similarity would not be satisfactory criteria for any such taxonomy because they refer to features that tend to be less permanently characteristic of individual written languages. Others could not be integrated into this taxonomy because they would group alphabets in ways that would cut across the groupings produced by the criteria already being used. Three kinds of similarity which have not been used as criteria for this taxonomy but which should be treated by more general studies of written language are:

1. The directions of writing within a text.
2. The extent to which phonemes of various kinds are represented by letters.

3. The relative locations of the letters representing various kinds of phonemes. (One method for positioning vowel and consonant letters is described in the appendix to this paper.)

Scope of This Taxonomy

For a language which is both spoken and written, the graphemes of its written form can represent various kinds of linguistic units in its spoken form. The graphemes of a language which correspond to its vowel and consonant phonemes may be called the letters of its alphabet. Graphemes which correspond to words or to linguistic units of the semantics may be called logograms.

The taxonomy of alphabets and scripts described here is not intended to include logograms. It will, however, include syllabaries. The distinction between alphabets and syllabaries is awkward to draw in theory and harder to apply in practice, since the graphemes of both correspond to the phonemes of spoken language. It has sometimes been said that the letters of an alphabet represent all the phonemes of a language, while the marks of a syllabary correspond to entire syllables, or correspond to only the consonants of a language, or correspond to the consonants more completely than to the vowels. (This variety of definitions should give the reader some warning of the problems involved here.) Unfortunately for the writers who make this distinction, there is no language in which the writing system represents every phoneme of the spoken language. The writers who make this distinction disagree, moreover, on the precise size, separateness, location, and scarcity of vowel letters which are required to demote an alphabet to a syllabary.¹⁰ A complete theory of written and spoken language would have to make several interrelated distinctions in this matter, but a simple dichotomy of alphabets and syllabaries is not sufficient.

10. The reader should be warned that some writers have used the term "syllabary" as a pejorative. Historically, syllabaries preceded alphabets. A writer may choose to infer from this that a people which writes with a syllabary is more primitive (whatever that may mean) than a people which writes with an alphabet; and he may then try to show that his own language uses an alphabet while that of some people which he wants to disparage uses a syllabary. This whole game is a messy business which the present author does not want to get into.

Figure 1. Sketch of this sample taxonomy.

<i>Alphabets</i>	<i>Scripts</i>	<i>Genera of Scripts</i>	<i>Families of Scripts</i>
Czech	} Neoroman	} Romanoid*	} Hellenic
Dinka			
English			
German			
Hawaiian			
Icelandic			
Irish			
Kazakh			
Latin			
Malay			
Navajo			
Serbo-			
Croatian			
Spanish			
Swedish			
Turkish			
Latin	} Paleoroman Fraktur Gaelic	}	}
German			
Irish			
Buryat	} Neocyrillic*	} Cyrilloid	}
Chuvash			
Kazakh			
Russian			
Serbo-			
Croatian			
Udmurt			
Ukrainian			
Yakut			
Old Church			
Slavic	} Paleo- cyrillic	}	}
Modern Greek			
Coptic	Neohellenic	} Hellenoid	}
	Coptic		

NOTES

1. Languages which are named more than once in this taxonomy have been written by alphabets of more than one script.

2. Many of these taxa have members other than those shown here.

*Taxon illustrated in this paper.

— — — Taxon for which no name is proposed here.

<i>Alphabets</i>	<i>Scripts</i>	<i>Genera of Scripts</i>	<i>Families of Scripts</i>	
Hindi-Urdu	} Devanagari	} Devanagaroid	} Brahmic*	
Marathi				
Nepali				
Panjabi				
Assamese				
Bengali				} Bengali*
Gujarati				
Oriya				} Kaithi
Panjabi				
Tibetan				
Kannada	} Kannada	} Telugoid*		
Telugu				
Tamil	} Tamil	} Tamiloid		
Malayalam				
	} Malayalam	} Keraloid		
Burmese	} Burmese	} Burmoid	} Mesropic	
Mon				
Shan				
Lao	} Siamese	} Saimoid		
Thai				
Armenian	} Armenian	} Armenoid		
Georgian	} Khutsuri	} Paleokart- veloid		
Georgian	} Mkhedruli	} Neokart- veloid		
Amharic	} Ethiopic	} — — —	} — — —	
Ge'ez				
Tigrinya				
Cherokee				
Old Church Slavic	} Sequoyah	} — — —	} — — —	
	} Glagolitic	} — — —	} — — —	
Korean	} Hangul	} — — —	} — — —	
Cree				
Eskimo	} Evans	} — — —	} — — —	
Hebrew				
Karaim	} Hebrew	} — — —	} — — —	
Yiddish				
Arabic				
Hindi-Urdu	} Naskhi	} Araboid*	} — — —	
Kazakh				
Malay				
Panjabi				
Pashto				
Persian				
Turkish				

A Sample Taxonomy of Alphabets and Scripts

Kinds of taxa. The taxonomy of alphabets and scripts which is suggested by this paper has three regular levels of taxa higher and more inclusive than the individual alphabet. In order of increasing size and decreasing similarity, these are called *scripts*, *genera* of scripts (singular *genus*), and *families* of scripts.

The degree of similarity among alphabets or scripts which is necessary to place them in the same taxon on each of these levels is defined by the taxa which are described and illustrated here. The kind of similarity which is necessary to place alphabets or scripts in the same taxon varies somewhat from level to level of the taxonomy.

For alphabets to be included in the same script, their letters must have almost the same alphabetical orders and almost the same pronunciations, and they must be embodied almost entirely by characters with identical basic shapes. Characters from two languages have identical basic shapes if a person literate in both languages who sees the characters in isolation cannot tell which came from which language. From a printer's point of view, letters from two languages are embodied by identical basic shapes if he can use the same type to print either letter without causing a reader to think that something unusual has occurred.

For scripts to be included in the same genus, or for genera to be included in the same family, the letters of their alphabets must have similar alphabetical orders and similar pronunciations, and the basic shapes which embody them must show certain patterns of similarity from one smaller taxon to another within the larger taxon. Although the same criteria apply to both of these taxonomic levels, much greater similarity is expected among alphabets of the same genus than is expected among alphabets of the same family but different genera.

An outline of this taxonomy. Figure 1 contains a sketch of the taxonomy of alphabets and scripts which is suggested by this paper.¹¹ The author has availed himself of the taxonomist's traditional prerogative to make up names for the taxa which he is the first to propose. The names

11. The taxonomy presented here has been developed from the author's earlier classification for alphabets (Herrick 1966, pp. 13-23). All of his acknowledgements should, of course, be repeated here. The author also wants to thank P. K. Saha, Robert A. Palmatier, and Hardy Carroll for their helpful comments on the present paper.

given to the genera of scripts all have the suffix “-oid”; these names should be distinctively marked, since the genera of scripts in a completed taxonomy will be few enough that anyone interested in the study of written language can learn something about all of them, and therefore those names will be frequently used to describe alphabets and scripts. In a few cases where a name has not been made up for a taxon, a line of dashes appears in Figure 1.

Scripts. The similarity between alphabets which is necessary for their inclusion in the same script is suggested by the alphabets and scripts named in Figure 1 and is illustrated in Figures 2 and 3. Each of these scripts is exemplified by two or more of its alphabets. The listing for each alphabet shows its letters in their alphabetical order, the pronunciations of its letters, and the basic shapes which embody them. These pronunciations are shown here by characters of the International Phonetic Alphabet¹² written between square brackets; no more than three pronunciations are shown for each letter. Phonetic symbols listed in this way can only suggest the actual correspondences between the letters and phonemes of a language, but they will serve well enough to show the similarities in pronunciation which must exist among the alphabets of a script. If two or more basic shapes are shown for a letter, they may be stylistic variants, variants conditioned by segmental or suprasegmental graphemes, or variants corresponding to different pronunciations; no more than three basic shapes are shown for each letter. In Figures 2 and 3 the letters which are embodied by the same basic shapes have been placed together, insofar as this may be done without altering their respective alphabetical orders.

The Neocyrillic script (Fig. 2) is probably the world's second largest script—next in size only to the Neoroman script—and is now used for a large number of languages which occur in the Soviet Union and in several other countries. It is exemplified here by three of its alphabets. The name “Neocyrillic” has been used to distinguish these alphabets from alphabets like that used for the Russian language before Tsar

12. The International Phonetic Alphabet may be conveniently found in recent editions of *Encyclopædia Britannica* in the article “Phonetics,” as well as in many linguistic textbooks.

Russian Alphabet			Ukrainian Alphabet			Serbian Alphabet		
Letter	Pronunciation	Other basic shapes	Letter	Pronunciation	Other basic shapes	Letter	Pronunciation	Other basic shapes
А	[a,ə]	а а	А	[a]	а а	А	[a]	а а
Б	[b]	б б	Б	[b]	б б	Б	[b]	б б
В	[v]	в в	В	[v,w]	в в	В	[v]	в в
Г	[g]	г г	Г	[h]	г г	Г	[g]	г г
Д	[d]	д д	Д	[d]	д д	Д	[d]	д д
Е	[e,je,jo]	е е	Е	[æ]	е е	Е	[e]	е е
Ж	[ʒ]	ж ж	Є	[jɛ]		Ж	[ʒ]	ж ж
З	[z]		Ж	[ʒ]	ж ж	З	[z]	
И	[i+i,j]	и й	З	[z]	з з	И	[i]	и и
			И	[ɛ]	и и			
			І	[i]	і і			
			Ї	[ji]	ї ї			
			Й	[j]	й ѣ			
К	[k]		К	[k]		Ј	[j]	ј ј
Л	[l]	л л	Л	[l]	л л	К	[k]	
М	[m]		М	[m]		Л	[l]	л л
Н	[n]		Н	[n]		Љ	[ɮ]	љ љ
О	[a,o,ə]		О	[o]		М	[m]	
П	[p]	п п	П	[p]	п п	Н	[n]	
Р	[r]	р р	Р	[r]	р р	Њ	[ɲ]	
С	[s]		С	[s]		О	[o]	

Figure 2. Alphabets of the Neocyrillic script.

Peter I's reform of the Russian writing system.¹³ The former Russian alphabet and the alphabet still used to print texts in the Old Church Slavonic language would belong to the Paleocyrillic script.

The Bengali script (Fig. 3) includes the Bengali and Assamese alphabets, which are shown to exemplify it, and the alphabets of a

13. Tsar Peter I's reform of the Russian writing system has been described by Kaldor (1969-70).

m	m̄	h	y	ϕ	ϕ	u	μ	u	u
[t]	[c]	[u]	[f]	[x]	[ts]	[tʃ]	[dʒ]	[ʃ]	
T	Ṭ	Y	Φ	X	Π	Ψ	Ψ	III	
m	m̄	y	ϕ	ϕ	u	u	u	u	u
[t]	[u]	[f]	[x]	[ts]	[tʃ]	[ʃ]	[tʃ]	[ju]	[jə]
T	Y	Φ	X	Π	Ψ	III	III	Ю	Я
m	m̄	y	ϕ	ϕ	u	u	u	u	u
[t]	[u]	[f]	[x]	[ts]	[tʃ]	[ʃ]	[tʃ]	[jə]	[ja, jə]
T	Y	Φ	X	Π	Ψ	III	III	Ђ	Ђ

few other languages spoken in the part of India which lies east of Bengal. Like every other script used in India, it includes also an alphabet for the Sanskrit language.

The varieties of writing which are used for the Arabic language pose difficulties for a taxonomy. The Arabic writing system and the writing systems of other languages which have been derived from it definitely form one genus of scripts, which may be called the genus Araboid. The difficulties arise in the subdividing of this genus into scripts. Figure 4 shows a selection of the kinds of characters which must be

Assamese Alphabet		Bengali Alphabet	
Letter	Pronunciation	Letter	Pronunciation
অ	[ɔ, o]	অ	[ɔ]
আ	[a]	আ	[a]
ই	[i]	ই	[i]
ঈ	[i]	ঈ	[i:]
উ	[u]	উ	[u]
ঊ	[u]	ঊ	[u:]
ঋ	[ɹ]	ঋ	[ɹ]
ঌ	[ɛ]	ঌ	[e,ɛ]
৊	[o]	৊	[ɔ]
ঔ	[u]	ঔ	[o]
৐	[o]	৐	[ow]
ক	[k]	ক	[k]
খ	[kh]	খ	[kh]
গ	[g]	গ	[g]
ঘ	[gh]	ঘ	[gh]
ঙ	[ɟ]	ঙ	[ɟ]
চ	[ʃ]	চ	[tʃ]
ছ	[ʃ]	ছ	[tʃh]
জ	[ʒ]	জ	[dʒ]
ঝ	[ʒ]	ঝ	[dʒh]
ট	[t]	ট	[t]
ঠ	[th]	ঠ	[th]
ড	[d,ɹ]	ড	[d,ɹ]
ঢ		ঢ	
ণ		ণ	
ত		ত	
থ		থ	
দ		দ	
ধ		ধ	
ন		ন	
প		প	
ফ		ফ	
ব		ব	
ভ		ভ	
শ		শ	
ষ		ষ	
স		স	
হ		হ	
ৱ		ৱ	
ঌ		ঌ	
঍		঍	
আ		আ	
ই		ই	
ঈ		ঈ	
উ		উ	
ঊ		ঊ	
ঋ		ঋ	
ঌ		ঌ	
৊		৊	
ঔ		ঔ	
৐		৐	
৑		৑	
৒		৒	
৓		৓	
৔		৔	
৕		৕	
৖		৖	
ৗ		ৗ	
৘		৘	
৙		৙	
৚		৚	
৛		৛	
ড়		ড়	
ঢ়		ঢ়	
৞		৞	
য়		য়	
ৠ		ৠ	
ৡ		ৡ	
ৢ		ৢ	
ৣ		ৣ	
৤		৤	
৥		৥	
০		০	
১		১	
২		২	
৩		৩	
৪		৪	
৫		৫	
৬		৬	
৭		৭	
৮		৮	
৯		৯	
১০		১০	
১১		১১	
১২		১২	
১৩		১৩	
১৪		১৪	
১৫		১৫	
১৬		১৬	
১৭		১৭	
১৮		১৮	
১৯		১৯	
২০		২০	

Figure 3. Alphabets of the Bengali script.

classified under the genus Araboid. The printer's types that are used to print all of these languages are generally based on the Naskhi style of character, although many languages are usually printed in other styles of characters by lithographing from hand-drawn originals. The author has therefore defined within the genus Araboid the Naskhi script, and has included within it these alphabets of printer's type. A more satisfactory subclassification of this genus must await further investigation of the ways in which these styles of characters are used for writing various languages.

Genera of scripts. The similarity between scripts which is necessary for their inclusion in the same genus of scripts is illustrated in Figures 5 and 6. Each of the genera defined here is exemplified by alphabets from two or more of its scripts, each script being represented by one of its alphabets. These alphabets are shown in the same way as those which are given as examples of scripts.

تنوع القاطن السبع الطوال

KUḤFĪ

اذ قال رجل يا رسول الله نمرة فلبسها
فوما بها الى الرجل صنعت

NASKHĪ

الرحمون برحمهم الرحمن رحمة في الارض يرحكم منه في السماء
الرفعة في خط الرفعة

RUQḤAH

الجمال سحر يضي على الكون روعته وتسير في موكبه الضنون
نتعليق أو الفارسي

NASTAʿLĪQ OR FĀRISĪ

الجمال سحر يضي على الكون روعته وتسير في موكبه الضنون

DĪWĀNĪ

Figure 4. Writing in several varieties and alphabets of the genus Araboid.

there are certain seldom-used styles of printer's type, such as Civilité, which probably constitute other scripts of the genus Romanoid. The Palcoroman script includes only the alphabet of classic Latin, which had no suprasegmental graphemes and only one basic shape for each letter.

The genus Telugoid (Fig. 6) is exemplified by its only two alphabets, each of which constitutes a separate script. The Kannada and Telugu languages, like many other languages of India, are examples of the

Neoroman Script

Represented by the English alphabet

Fraktur Script

Represented by the German alphabet of that script

Gaelic Script

Represented by the Irish alphabet of that script

Letter	Pronunciation	Other basic shapes	Letter	Pronunciation	Other basic shapes	Letter	Pronunciation	Other basic shapes
A	[æ,ej]	a a	ⱶ	[a,ɛ]	ⱶ ä	ⱶ	[ɔ]	ⱶ
B	[b]	b	ⱷ	[b]	ⱷ	ⱷ	[b]	ⱷ
C	[k,s]		ⱸ	[k]	c	ⱸ	[k]	
D	[d]	d	ⱹ	[d]	d	ⱹ	[d,ð]	ⱹ
E	[ɛ,i]	e e	ⱺ	[e,ɛ,ə]	e	ⱺ	[e,ɛ]	e
F	[f]	f f	ⱻ	[f]	f	ⱻ	[f]	
G	[g,dʒ]	g g	ⱼ	[g]	g	ⱼ	[g]	
H	[h]	h	ⱽ	[h]	h	ⱽ	[h]	h
I	[i,aj]	i i	Ȿ	[i]	i	Ȿ	[i]	
J	[dʒ]	j	Ɀ	[j]	j			
K	[k]	k k	Ɀ	[k]	k			
L	[l]	l l	Ɀ	[l]	l	Ɀ	[l]	l
M	[m]	m	Ɀ	[m]	m	Ɀ	[m]	m
N	[n]	n	Ɀ	[n]	n	Ɀ	[n]	n
O	[o,ow,ə]		Ɀ	[o,ø]	o ö	Ɀ	[o]	
P	[p]	p	Ɀ	[p]	p	Ɀ	[p]	
Q	[k]	q	Ɀ	[k]	q			
R	[r]	r	Ɀ	[r]	r	Ɀ	[r]	r
S	[s,z]		Ɀ	[s,z]	s f	Ɀ	[s,ʃ]	r
T	[t]	t t	Ɀ	[t]	t	Ɀ	[t,θ]	
U	[u,yuw,ə]	u	Ɀ	[u,y]	u ü	Ɀ	[u]	
V	[v]	v	Ɀ	[f]	v			
W	[w]	w	Ɀ	[v]	w			
X	[ks]		Ɀ	[ks]	x			
Y	[j]	y y	Ɀ	[j]	y			
Z	[z]		Ɀ	[ts]	z			

Figure 5. Scripts of the genus Romanoid.

Kannada Script		Represented by the Kannada alphabet	
Letter	Pronunciation	Other basic shapes	
ಅ	[ə]		
ಆ	[a:]		
ಇ	[i]		
ಀ	[i:]		
ಊ	[u]		
ಋ	[u:]		
ಋ	[ɾɨ]*		
ಌ	[e]		
಍	[e:]		
ಐ	[ə]		
ಋ	[o]		
ಠ	[o:]		
ಉ	[əw]		
ಕ	[k]		
ಖ	[kh]*		
ಗ	[g]		
ಘ	[gh]*		
ಙ	[ŋ, ts]		
ಚ	[tʃh]*		
ಛ	[dʒ, dz]		
ಜ	[dʒh]*		
ಟ	[ʈ]		
ಠ	[ʈh]		
ಡ	[ɖ]		
ಢ	[ɖh]		
ತ	[t]		

Telugu Script		Represented by the Telugu alphabet	
Letter	Pronunciation	Other basic shapes	
అ	[ə]		
ఆ	[a]		
ఇ	[i]		
ఀ	[i:]		
ఊ	[u]		
ఋ	[u:]		
ఠ	[ɾu]*		
ఌ	[ɛ]		
఍	[e]		
ఐ	[aj]		
ఋ	[o]		
ఠ	[ow]		
ఉ	[aw]		
క	[k]		
ఖ	[kh]*		
గ	[g]		
ఘ	[gh]*		
ఙ	[t]		
ఛ	[tʃh]*		
జ	[dʒ]		
ఞ	[dʒh]*		
ట	[ʈ]		

Figure 6. Scripts of the genus Telugoid.

linguistic situation which Ferguson (1959) has called “diglossa.”¹⁴ These languages contain many words which have been borrowed from Sanskrit but which are used only in literary, religious, and poetic speech and writing. These borrowed Sanskrit words are not usually assimilated to the pronunciation and writing systems of the borrowing languages, but retain certain sounds and letters which do not occur elsewhere in the borrowing language. This fact poses a large problem for the linguistic description of Kannada, Telugu, and the other Dravidian languages of southern India. All of these languages tend to have many fewer consonant phonemes than Sanskrit and its related

14. Ferguson defines diglossa as “a relatively stable linguistic situation in which, in addition to the primary dialects of the language . . . there is a very divergent, highly codified . . . superposed variety, the vehicle of a large and respected body of written literature . . . which is learned largely by formal education and is used for most written and formal spoken purposes but is not used by any sector of the community for ordinary conversation.”

Genus Devanagaroid			Genus Telugoid			Genus Sinhaleoid		
Represented by the Hindi alphabet of the Devanagari script			Represented by the Telugu alphabet of the Telugu script			Represented by the Sinhalese alphabet of the Sinhalese script		
Letter	Pronunciation	Other basic shapes	Letter	Pronunciation	Other basic shapes	Letter	Pronunciation	Other basic shapes
अ	[ə]	अ	అ	[ə]	అ	අ	[ə]	අ
आ	[a]	आ	ఆ	[a:]	ఆ	ආ	[a]	ආ
इ	[i]	इ	ఇ	[i]	ఇ	ඇ	[æ]	ඇ
ई	[i:]	ई	ఈ	[i:]	ఈ	ඈ	[æ:]	ඈ
उ	[u]	उ	ఉ	[u]	ఉ	ඉ	[i]	ඉ
ऊ	[u:]	ऊ	ఊ	[u:]	ఊ	ඊ	[i:]	ඊ
ऋ	[r]	ऋ	ఋ	[r]	ఋ	උ	[u]	උ
ॠ	[e]	ॠ	ఌ	[e]	ఌ	ඌ	[u:]	ඌ
ॡ	[æ,æj]	ॡ	఍	[e:]	఍	ඍ	[ε]	ඍ
ऋ	[o]	ऋ	ఐ	[ə]	ఐ	ඎ	[e]	ඎ
ॠ	[ɔ,ɔw]	ॠ	ఓ	[o]	ఓ	ඏ	[ɔ]	ඏ
			ఔ	[o:]	ఔ	ඐ	[ow]	ඐ
			ౌ	[ow]	ౌ	එ	[aj]	එ
						ඒ	[aw]	ඒ
						ඓ	[ri]	ඓ
						ඔ	[ri:]	ඔ
						ක	[k]	ක
						ඛ	[kh]	ඛ
						ග	[g]	ග
						ඝ	[gh]	ඝ
						ඞ	[ɟ]	ඞ

Figure 7. Genera of the family Brahmic.

of this family are named in Figure 1, and there are other alphabets used in southern and southeastern Asia which will probably form other genera belonging to it. Since it is not convenient to match up their corresponding letters, the alphabets which exemplify the family Brahmic in Figure 7 are simply shown alongside one another, each in its own alphabetical order.

[tʃ] [tʃh] [dʒ] [dʒh] [r] [r̥] [tʰ] [d̥] [d̥h] [n̥] [θ] [θh] [ð] [ðh] [ŋ] [p̥] [p̥h] [b̥] [b̥h] [m̥] [l̥] [l̥h] [v̥] [s̥] [s̥h] [h̥] [ʃ]

च च्ह ज ज्ह र र्ह त त्ह द द्ह न थ थ्ह ध ध्ह ङ ल ल्ह व व्ह श श्ह ह ह्ह

[tʃh] [dʒ, dz] [dʒh] [r̥] [tʃh̥] [d̥] [d̥h̥] [n̥] [r̥] [tʃh̥] [d̥] [d̥h̥] [ŋ̥] [p̥] [p̥h̥] [b̥] [b̥h̥] [m̥] [l̥] [l̥h̥] [v̥] [s̥] [s̥h̥] [h̥] [ʃh̥]

च च्ह ज ज्ह र र्ह त त्ह द द्ह न थ थ्ह ध ध्ह ङ ल ल्ह व व्ह श श्ह ह ह्ह

क क. र. ङ म

[tʃ] [tʃh] [dʒ] [dʒh] [r] [r̥] [tʃh̥] [d̥] [d̥h̥] [n̥] [θ̥] [θ̥h̥] [p̥h̥] [b̥] [b̥h̥] [m̥] [l̥] [l̥h̥] [v̥] [s̥] [h̥]

क क्ह र र्ह त त्ह द द्ह न थ थ्ह ध ध्ह ङ ल ल्ह व व्ह श श्ह ह ह्ह

Some Further Definitions

Multiple alphabets for a language ; varieties of an alphabet. It is no uncommon thing for a language to be written by different alphabets at different times in its history, and it occasionally happens that a language is written by more than one alphabet at the same time. If these alphabets belong to the same script and there are only slight differences between them, they may be described as varieties of the same alphabet. For example, the Russian orthographic reform of 1918 dropped from that alphabet four letters, two of which were rarely used. The present alphabet, which was established by that

reform, and the alphabet used before 1918 should be regarded as two varieties of the same alphabet, and may be referred to as the Russian (1918 variety) alphabet and the Russian (Peter I variety) alphabet.

If, however, the alphabets of a language belong to different scripts, they must be regarded as different alphabets, and may be distinguished by annexing to their names the names of taxa to which they belong. The two alphabets which have been used to print the German language during this century belong to different scripts of the same genus; they may therefore be distinguished by the names of their scripts as the German (Neoroman) alphabet and the German (Fraktur) alphabet. The two alphabets which are presently used to write the Serbo-Croatian language belong to different genera of the same family. Because of the unusual situation in Serbo-Croatian, they are usually called the Serbian alphabet and the Croatian alphabet, but they may be distinguished more systematically as the Serbo-Croatian (Cyrilloid) and Serbo-Croatian (Romanoid) alphabets, using the names of their respective genera. The alphabets by which the Turkish language is now written and was written before its reform in 1928 have little in common except the need to correspond to the phonemes of Turkish. They may be distinguished as the Turkish (Romanoid) alphabet and the Turkish (Araboid) alphabet.

Sum of a script. This is the set of all letters which occur in at least one of the alphabets of the script. From a printer's point of view, the sum of a certain script is the set of letters for which he must have types (or matrices) in order to be prepared to print in any and every language which has an alphabet of that script.

Quasi-alphabet. There are some systems of written marks which seem to be alphabets—in that they have graphemes, an ordered arrangement, correspondences between their graphemes and certain kinds of speech sounds, and basic shapes for the characters which embody their graphemes—but which are not alphabets because they do not belong to any language. These systems of characters may be called quasi-alphabets. They include, among others, systems of transliteration, systems of phonetic notation like the International Phonetic Alphabet, and alphabetical proposals such as that made for African languages by the International African Institute (1962). Each quasi-alphabet belongs to its appropriate script, and its graphemes are included in the sum of that script.

Generic ligatures ; specific ligatures. A ligature is treated by a language in one of two ways, depending on how it embodies the letters of that language. If a character is an embodiment of two or more letters of an alphabet, it is a *specific ligature*. If it is an embodiment of only one letter but can be recognized, by people who are well acquainted with other alphabets of the same script, as a compound of two or more other characters, it is a *generic ligature*. In English, ffi (f + f + i) is a specific ligature, while w (v + v) is a generic ligature. A ligature may have different status in different languages. Æ is a generic ligature and embodies a single letter in the Danish language, but in the modern English language it is a specific ligature embodying the letters a and e.

Suggestions for Future Research

The taxonomy presented here is only a preliminary outline which will require much work by many hands to become a useful taxonomy of writing systems.

The three taxonomic levels—scripts, genera, and families—may prove to be too many or too few. Consensus will have to develop on the number of taxonomic levels which can be usefully defined and on the kinds and degrees of similarity which are appropriate at each level.

The sample taxonomy does not accommodate all of the world's alphabets. As other alphabets are added to the taxonomy, new taxa will have to be defined to accommodate some of them. The possibility of including logographic writing systems within this taxonomy should be investigated. Some of the taxa described may have to be moved from one level to another; some may prove to be ill-advised and will have to be broken up, with their members reassigned to other taxa. Some lower taxa which appear here as taxonomic isolates can perhaps be included with others in higher taxa.

A taxonomy of this kind is not the only possible classification which can be made of written languages. If other classifications are made that appear to cut across these taxa, the relationships between those classifications and this taxonomy should be investigated.

Although this taxonomy has been constructed by synchronic comparison of writing systems without regard for their historical relationships, the comparison of this taxonomy with the historical relationships of writing systems may lead to some interesting results.

APPENDIX

The taxa which are shown in Figures 3, 6, and 7 use the same system for positioning their vowel and consonant letters; this method is illustrated in Figure 8 by examples from the Devanagari alphabet of Sanskrit. In all of these languages, written words are divided into graphic syllables; each graphic syllable consists of a single vowel letter, a single consonant letter, a sequence of consonant letters, a single consonant letter followed by one vowel letter, or a sequence of consonant letters followed by one vowel letter. (The letters of graphic syllables are not necessarily written in the same order as their corresponding phonemes are spoken; "sequence" and

Figure 8. Arrangement of vowel and consonant letters in the Devanagari alphabet of Sanskrit.

इव प्रति देवास्याम्
[i va pra ti de vā sjā m]

Example of the written language, with its pronunciation divided into syllables.

इव प्रति देवास्याम्
[v pr t d v sj m]

Characters corresponding to single consonants or groups of consonants.

इव प्रति देवास्याम्
[i a a i e ā ā] NO VOWEL

Characters corresponding to vowels.*

प्र स्य
[pr] [sj]

Ligatures: characters corresponding to groups of consonants.

प्र प्र स्य स्य
[p r] [s j]

Decomposition of ligatures.

*The vowel [a] is represented by the absence of any vowel letter; the absence of a vowel phoneme in a syllable is represented by the mark shown here.

similar terms in this description refer not to the letter graphemes but to their corresponding phonemes.)

The marks which write the letters of these languages are of two sizes: large and small. Every letter has its own large mark; some letters also have small marks, which may or may not be partially similar to their large ones. Whenever a graphic syllable consists of only one letter, whether a vowel or a consonant, that letter is written by its large mark. But whenever a graphic syllable consists of a consonant letter followed by a vowel letter, the consonant of that syllable is written by its large mark and the vowel is written by a small mark located in a definite place within the space around the consonant mark—the vowel mark's shape and its location with respect to the consonant mark being equally essential.¹⁶ Whenever two or more consonant letters occur in the same graphic syllable, they may be written in one of three ways, depending on the letters and the language: the consonants may be written as a ligature, the parts of which may or may not be similar to the letters' own large or small marks; one consonant (typically the first) may be written by its large mark, with the other consonants being written by small marks placed somewhere around that large mark; the large marks for all of the consonants may be written in the same order as their corresponding phonemes are spoken. Whenever a graphic syllable consists of two or more consonants and a following vowel, the consonant letters are written as they would be if there were no vowel in the syllable, and the vowel letter is written by its small mark positioned around the whole consonantal assemblage as it would be positioned around a single consonant's large mark.

For many of these languages, there is a vowel letter which has no small mark and which, when it occurs in a syllable with a consonant letter, is written by the absence of any small vowel mark. In such a language, a syllable that contains no vowel may be written with a special mark located like a small vowel mark.

In Figures 3, 6, and 7, the small marks used to write vowels that are in the same syllables as consonants are listed in the columns headed "other basic shapes." To show the required locations of these small vowel marks, the position of the mark embodying the syllable's consonant is represented in the illustration by a gray square, and the vowel mark is shown in its proper place with respect to that square. Figures 3, 6, and 7 do not show the ligatures or the small consonant marks which may be used when more than one consonant letter occurs in one syllable.

16. This method of representing vowel phonemes is called Type III vocalization by Gelb (1963, pp. 197–98).

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The Rune Stones of Spirit Pond, Maine

Einar Haugen

The author reports on his official investigation of inscriptions on three rune stones discovered in 1971 by Walter J. Elliott near Spirit Pond, Maine (USA). In determining the authenticity of the stones as Viking Age artifacts, three steps were involved: (1) transcription of the runes, (2) transliteration into the Latin alphabet, and (3) interpretation of the meaning of the inscriptions. The relationship of runes (as alphabetic symbols) to the history of Scandinavian languages is outlined; special problems of these inscriptions are discussed: (1) the runes are not those used in the eleventh or later centuries, (2) spelling and the use of "runic" numerals are inconsistent with runic and scribal practice, (3) the grammatical form is unrecognizable as Old Norse, (4) peculiarities relate directly to the Kensington Stone inscription in Minnesota. Conclusion: the inscriptions could not have been carved by Scandinavian Vikings in the Middle Ages, and probably date since 1932.

Circumstances of the Find

On May 27, 1971, Walter J. Elliott, a carpenter of Quincy, Massachusetts, was hunting for artifacts in the Popham Beach area near Phippsburg, Maine. He had noticed the west bank of Spirit Pond on a previous visit and now decided to explore it. While hunting around, he happened to kick over a stone and noticed some marks on it. Picking it up, he found that it was covered with moss and dirt as if it had fallen out of the bank, and proceeded to wipe it clean at the shore with some seaweed. This was the stone with the long inscriptions (SP-3). He then went back to look for more, and among the various stones lying there he found the map stone (SP-1), half concealed under the first, and finally the round one (SP-2) below that. He continued hunting and found some further artifacts, but none of these had any inscriptions. The location was at the outlet of Spirit Pond.

The further story of Elliott's adventures with the stones is well told in Calvin Trillin's article in *The New Yorker* of February 5, 1972. I summarize here from Elliott's account to me. He went first to the

Bath Marine Museum, where the curator, Harold Brown, took a great interest in the stones, made rubbings, and suggested that they might be Viking artifacts. Elliott tried to find an archaeologist at Bowdoin College in Brunswick, but was unable to do so. He told his story to Evan Richert of *The Bath-Brunswick Times Record*, who published the first story with photographs the following week. Elliott also went to the Peabody Museum at Harvard University, but again failed to contact anyone to whom he could show the stones. Through the newspaper publicity John Briggs, Historian of the State Park and Recreation Commission of Maine at Augusta, learned of the stones and raised the question of ownership. Since the land on which they were found was state property, Briggs wrote to Elliott on August 31 to inform him that the stones belonged to the State of Maine and that he should turn them over to the State Park and Recreation Commission. Elliott responded to Briggs' letter by rejecting the request in a telegram on September 9. The following day he sent a new wire: "Just returned from Phippsburg, reburied stones on state land near site for some other fool to find. Disgustingly yours." He had, in fact, buried them, and there they remained for four months.

By then Elliott realized the potential value of his find, and did not want to lose his profits by giving the stones to Maine. He had written letters to various persons around the country whose names had been suggested to him in the local public library. He had received an enthusiastic reply from Dr. O. G. Landsverk in Glendale, California, who had been claiming the existence in runic inscriptions of so-called "runic puzzles," i.e., cryptograms said to be deliberately concealed under the plain text of runic inscriptions. Within a very short time, Landsverk announced, not only to Elliott but also to the press, that the stones were genuine Viking Age artifacts, and promised a future book on the subject. Not only did these claims confirm Elliott's determination to keep the stones, but they also led to sensational news stories. Among the most astonishing was one in *The Maine Times* for December 3, 1971. The newspaper proclaimed a "solution" based on Landsverk's methods, which involved one Bishop Eric known from Icelandic sources, who is not obviously named on the stone. An editorial in the same issue proclaimed that all should "consider it settled" that the Vikings "were here in Maine 400 years before Columbus."

The result of the uproar was that Elliott decided to ask \$4500 for the stones, an amount which the State of Maine or its museums obviously could not properly pay. Eventually an interested citizen of Philadelphia provided the money, and the stones were turned over to the officials of the Maine State Museum in Augusta, with much fanfare, in late January, 1972. Earlier, on October 27 and November 17, two digs had been instituted at the site of the find, under the direction of Harold E. Brown, with the assistance and support of John Briggs; the results are meager and appear to have no relation to the stones. After the return of the stones, the State Museum put the investigation into the hands of Dr. Bruce J. Bourque, its newly appointed archaeologist.

Bourque asked me to make an official investigation of the runic inscriptions and brought the stones to my office on February 9, 1972. The following report is my best judgment on the stones and their inscriptions.

Runes and the Languages in Which They Are Written

The decipherment of a runic inscription involves three main steps: (1) transcription of the runes; (2) transliteration of the runes into the Latin alphabet; (3) interpretation of the meaning of the inscription. Each of these steps involves problems, which are not entirely unrelated. However, by separating the process into these three steps one can point to the specific elements that determine the authenticity or non-authenticity of an inscription.

(1) *Transcription of the runes.* Runes are alphabetic symbols, just as Latin letters are. They have no more and no less magic function than the Latin letters, and they belong to the same tradition of writing. They are later than and secondary to the Greek and Latin alphabets, and it is universally accepted by competent scholars that they were created by Germanic/Scandinavian tribesmen within a century or two after the birth of Christ. The earliest inscriptions are found in Denmark and Norway around 200 A.D., and from that time the tradition was unbroken down to early modern times in Scandinavia. The runes show by their forms and their phonetic values that they are based on the classical alphabets. There are two varieties: the older runes, in use down to around 800 A.D., a 24-letter alphabet; and






the younger runes, in use from 800 A.D. until the runes died out, a 16-letter alphabet. The earliest inscriptions in the 16-letter alphabet are found in Denmark around 800. In various forms this basic alphabet spread throughout Scandinavia and to the colonies established by Scandinavians in Russia, the British Isles, the Faroe Islands, Iceland, and Greenland. Several thousand inscriptions are known, and most of these have been published in elaborate editions, with photographs and transcriptions, by Scandinavian runologists.

The younger runes were developed out of the older ones, as is clear from the fact that (a) they are arranged in approximately the same order (the first six runes represent *futhark* in both and the alphabets are therefore known as *futharks*); (b) several of the symbols are identical in form and value; and (c) those that are not can be explained as developments from older symbols. The special characteristic of the younger futhark is that it has dropped several of the older runes and has doubled up the values of the ones that remain. Thus the runes *p d g* are lost, so that these sounds are represented by the runes for *b t k*, which therefore have a double value: B is either *b* or *p*, T is either *d* or *t*, and K is either *g* or *k*.


The consonants *w* and *j* were also lost and are represented, when needed, by the vowels *u* and *i*: U is either *u* or *w*, I is either *i* or *j*.

The vowels *e* and *o* were lost and are represented by *i* and *u*, so that I can also represent *e* and U can also stand for *o*. However, the first *a* (A or A^{h}) changed its value to *o* about 1050, so that the usual symbol for *o* came to be A^{h} or A , originally a nasalized *a*.

The vowels *y* and *ø* which developed in Old Norse had no special symbols in the younger futhark, so that they were both written with the rune for *u* (U), which therefore could have the values *u*, *w*, *o*, *y*, or *ø*. The younger futhark developed three major forms: the *standard* (also called “Danish” runes), the *short-branch* (also called “Norwegian–Swedish” runes), and the *staveless* (also called “Swedish” or “Hälsing” runes). Each of these had its special forms and was used in particular areas and times; there were also mixed forms that were influenced by more than one type.

In the eleventh century (after the introduction of Christianity and the Latin alphabet for parchment writing) a system of “dotted” runes developed. This involved the addition of a dot to distinguish more than one value of the same rune: so  was used for þ,  for d,  for g,  for e,  for y.

Since the form of the runes was generally maintained quite faithfully within each tradition, there is usually no serious problem in transcribing the runes, except where weathering has made them indistinct. In such cases it may be impossible to be sure if one is dealing with runes or with cracks, scratches, or doodlings, and great ingenuity is required. Many erroneous readings have been made, especially of the older inscriptions. It is common to chalk the inscription before photographing, but this can be deceptive, since it is easy to imagine letters where one wishes to see them. One should have both chalked and unretouched photographs. When working with the inscriptions, it is common to make latex impressions, which bring out the letters even better than the naked eye. Any reading that remains doubtful after careful inspection is marked by a dot under the rune.

(2) *Transliteration of the runes into the Latin alphabet.* In general it is possible and customary to transliterate the runes into the corresponding Latin letters. Each such transliteration represents a decision by the scholar as to the value of the rune and its significance in this particular inscription. For most runes there is little question, since their forms are well known and have the same value throughout the runic tradition of carving. Others are more questionable, since they can appear in more than one alphabet. The transliteration is always on the principle that each rune is given the same symbol wherever it appears in an inscription. This does not necessarily correspond to its phonetic value; e.g., the  in an undotted futhorc is represented as *b*, regardless of the fact that it may stand for either *b* or *þ*. Most runic inscriptions are short on punctuation, and there are no capital letters (or rather, there are no small letters: they are all capitals). The interpretation of the values in terms of the language is part of the next step.

Most of the 16-rune futharks have the following values when they are transcribed, and in this order: *f u þ* (=th) *a* (later *o*) *r k h n i a s t b m l y* (or a special *r*).

(3) *Interpretation of the meaning of the inscription.* Having established the transliteration, the most difficult and important step remains. This is to determine just how the letters are to be grouped into words and the words into sentences. To do this one needs to know what language is being used. For any given inscription it is clear that it is written in the language (or more strictly the dialect) of a particular person at a particular time and place. It is of course helpful if we already know what this is, but even if we do not, knowledge of the various possible dialects in which runic inscriptions were written is absolutely essential. The first approach may be one of guessing one's way to an interpretation, but no interpretation can be regarded as established unless it is in accord with what is known about the history of the Scandinavian languages from the second century A.D. down to the present. Certain changes are known to have occurred during this long period at various rates in different parts of Scandinavia. An important point to consider is that there was no formal instruction in runic writing; it was passed on from one carver to another, and each one was free to follow his own dialect in writing. In practice, however, most carvers employed not only the customary values of the runes that they had been taught, but wrote as was usual in their time and community. There are, of course, mistakes in carving, and there are inadequacies in the writing as a reflection of speech, but in general the tradition was firm. There is no basis for the assumption by some amateurs that there were no rules and that everybody wrote as he pleased.

The languages involved may be characterized as follows. The earliest inscriptions (c. 200–550) were in *Early Scandinavian* (Proto-Scandinavian or *Urordisk*), which is very close to Germanic. The later inscriptions (c. 550–1050) were in *Common Scandinavian* (*Fellesnordisk*), which shows very little differentiation between the various Scandinavian languages. The younger inscriptions (c. 1050–1350) were in the *Old Scandinavian* languages, which show a slight but clear difference between Old Danish, Old Swedish, Old Norwegian, and Old Icelandic—to mention the most important. The languages

(which were really only dialects) that were used in Norway and her colonies to the west, including the chief viking settlements in Britain, the Faroes, Iceland, and Greenland were *Old Norwegian* and *Old Icelandic*, often known together as *Old West Scandinavian*, or *Old Norse*. While Common Scandinavian is known only through runic inscriptions, the Old Scandinavian languages are also known through hundreds of extensive manuscripts. Their grammars and vocabularies are well known and are the object of academic study not only in Scandinavia, but at a goodly number of American universities. By 1350 the old Scandinavian languages gradually began to turn into the modern Scandinavian languages, which fully came into being by 1550, when these countries were converted to Lutheranism and produced translations of the Bible, which became the basis of a native literature.

For most of the inscriptions found in Scandinavia it has been possible to provide an interpretation that follows from the straight text of the inscription itself. Most of them are fairly stereotyped in content, so that one can predict how they are going to read. The great majority are memorial stones, which are intended to keep alive the memory of a particular person. The formula usually is: "N. N. raised this stone in memory of his father (or mother, brother, son, daughter) who was a good man (or who died in battle, etc.)." There are others that are more interesting, including many that refer to particular occasions and events. Some contain poetry. The great find of Norwegian inscriptions in the excavation of twelfth- and thirteenth-century Bergen in recent years showed that runes were common knowledge, and that many persons could carve them for the most varied purposes, all the way from markers of property to love verses and charms. Mostly they were carved on wood and were discarded after use.

In a few cases the inscriptions involve the replacement of the runes by a coded set of symbols which are known as "secret runes." It is usually quite obvious that these are in cipher: they make no sense at all unless the code is cracked. These are based on one of two methods. One is to replace the runes with symbols (usually with branches like trees) in which the branches on one side stand for the "family" of the rune, those on the other side for the position of the rune within that family. The basis for this is always the 16-rune futhark, with the

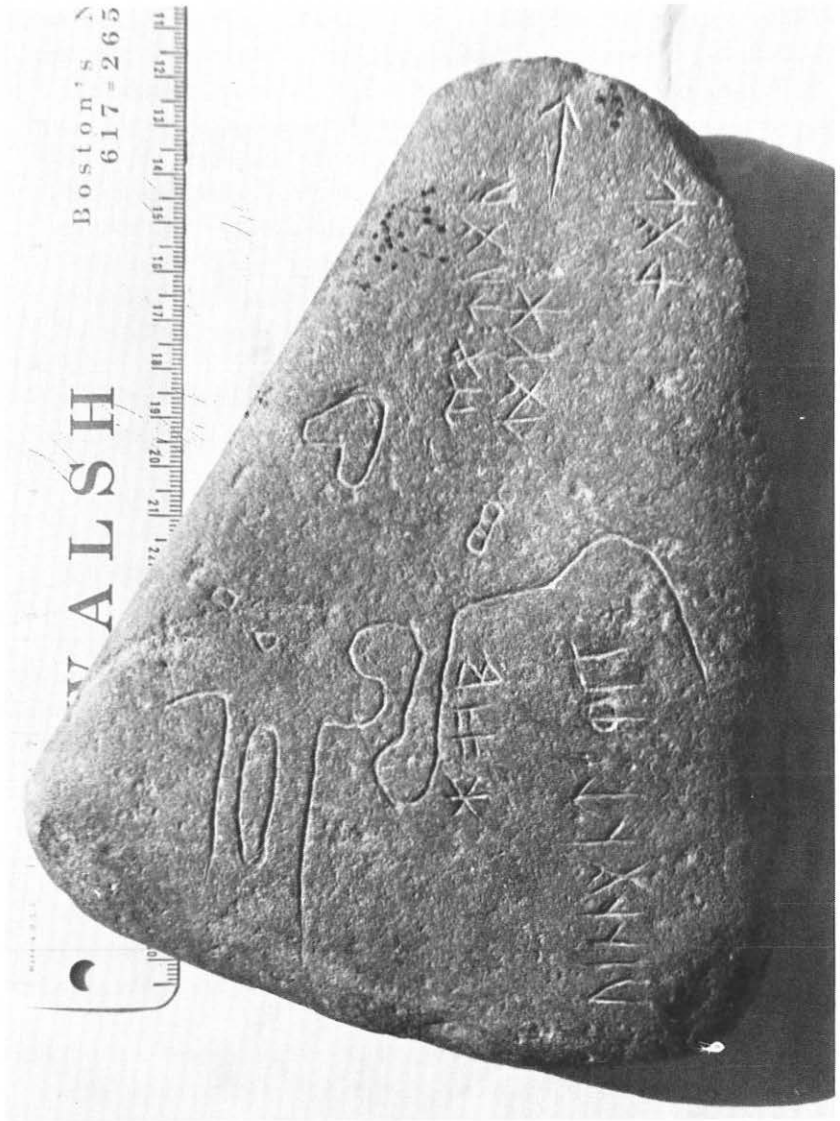




Figure 1. Spirit Pond rune stone 1, recto.



Figure 2. Spirit Pond rune stone 1, verso.

first and last family exchanged: (1) *t b m l y*; (2) *h n i a s*; (3) *f u þ o r k*. So a symbol like  stands for *i* (the rune ) , the third rune in the second family. Instead of branches, playful carvers used the whiskers on a man's face or the fins on a fish. Another method of disguise was the replacement (very rarely) of a rune by the one next to it in the futhark, e.g., *sakum* becomes *airfb* on the Swedish Rök Stone (c. 900 A.D.) by putting down *a* for the next rune *s*, etc.

The Spirit Pond Inscriptions: Decipherment, Interpretation, and Dating
Among the Spirit Pond artifacts there is one made of wood, numbered SP-5 by the archaeologists in charge of the investigation. This object has clearly been shaped by human hand, including a deep groove and some incisions with a sharp-edged tool. I have examined the object itself under a reading glass, as well as enlarged photographs furnished by the Peabody Museum. I can say with assurance that none of the incisions are runic. Whatever the purpose of the incisions may have been, such as ornamentation, they do not form the kinds of patterns that one would expect from runes. I would, therefore, reject these as objects of runic study.

However, the three stones delivered by Elliott do clearly contain runic inscriptions, and we shall now turn to the decipherment, interpretation, and dating of these.

The stones will be numbered as suggested in the Peabody Museum Report:

SP-1—a roughly triangular stone, 8 inches long, flat on two sides. The side with map and characters will be called the *recto* (1r [Fig. 1]), while the side with the pictographs and characters will be called the *verso* (1v [Fig. 2]).

SP-2 (Fig. 3)—a roughly elliptical stone, 5 inches long, with runic characters on one side.

SP-3—an irregularly shaped stone, 11 inches long, flat on both sides. The side with ten lines of writing, between roughly parallel lines, will be called the *recto* (3r [Fig. 4]), while the side with six lines will be called the *verso* (3v [Fig. 5]).



Figure 3. Spirit Pond rune stone 2.



Figure 4. Spirit Pond rune stone 3, recto.



Figure 5. Spirit Pond rune stone 3, verso.

(4) *Incorrect runes.* Where it is possible to make out the sense of the passage, one can see that the carver has made some errors. He probably intended that 1r.7 ᚠ should be ᚦ (to make the word *Vinland*); that 2.5 ᚦ should be ᚱ (to make the word *folk*); and there is space for two dots that were not carved at 3r3.19.

(5) *Lines (macrons) over the runes.* These occur only on SP-3, where they are found over the following characters:

3r1.2 ᚦ̄ 3r1.5 ᚠ̄ 3r1.9 ᚦ̄ 3r1.21 ᚱ̄ 3r5.8 ᚱ̄ 3r9.2 ᚱ̄
 3r9.5 ᚱ̄ 3v3.2 ᚱ̄ 3v3.6 ᚱ̄ 3v5.16 ᚱ̄ 3v5.19 ᚱ̄ 3v6.8 ᚱ̄
 3r10.5 ᚱ̄ 3v4.18 ᚦ̄

The runes are reduced in size to accommodate the macrons above them. No such feature occurs in Scandinavian runic inscriptions; something similar is known from manuscripts, but then only as an abbreviation for nasals (*m, n*) or *r*, which does not seem to be its function here.

(6) *Damage to the runes.* At 3v5.2–3v6.3 a piece of the surface has been chipped away, taking with it the upper part of a ᚱ and the lower part of an ᚠ. The readings are nevertheless clear. At the beginning of lines 3r4 and 3r5 one or more runes may be missing.

(7) *Differences in the shape of runes.* Occasionally the bars are placed higher or lower: ᚦ / ᚠ. This is normal and does not generally affect the reading.

With reservations made for some of the above exceptions, the inscriptions may be transcribed as follows:

Spirit Pond—1 (recto), Figure 1

There are four inscriptions, arranged as legends on what is clearly intended as a map of the Popham Beach area, including the mouth of the Kennebec River and some of its islands, as well as Spirit Pond and its outlet.

- 1] Below Spirit Pond and outlet: * 5 10 15
 2] In lower left corner: N I T X T : P T T :
 3] In the Kennebec River outlet, preceding an arrow pointing out to sea at the extreme right: ²⁰ T P X : ²⁵ T N X H : ³⁰ T X Y *
 4] In lower right corner: † X Y

Spirit Pond—1 (verso), Figure 2.

There is one inscription, along the upper edge of the surface, followed by a number of pictographs: Y | T T | X Y |

Below the pictographs there are two cryptic figures, one an X with an arc inscribed between its upper arms, the other a ladder-like figure with four full crossbars above four that do not cross, but are only on the right.

Spirit Pond—2, Figure 3.

There are two lines of runes:

- 1] T R Y H T † T Y
 2] H † X : Y

Spirit Pond—3 (recto), Figure 4.

There are ten lines, roughly filling the whole side:

- 1] _____
 5 10 15 20 25
 H T P X T N Y † T Y : K I T H X : H P X :
 2] _____
 5 10 15 20 25
 T P : P | P : * X T X P * | R : Y | P X I † P X P

- 3] *DY: X⁵ *R: P¹⁰ P: N¹⁵ N N¹⁵ 15X[:] 20 N²⁵ N²⁵ P:
- 4] GF: R⁵ 141: N¹⁰ 14↑: Γ¹⁵ F: †‡R: P: 4X²⁰ X²⁵ Y†
- 5] D†Y: 4⁵ K¹⁰ I¹⁵ P* I²⁰ YX†: *XXY ‡†: KX†: 25
- 6] *R↑†⁵ I¹⁰ K†: X¹⁵ ↑: N²⁰ 14↑: BX²⁵ X²⁵ I²⁵ X²⁵ YX:
- 7] 4⁵ I¹⁰ K¹⁵ X: K²⁰ I²⁵ 4⁵ K¹⁰ R¹⁵ I²⁰ Y†: Y²⁵ I²⁵ B²⁵ X²⁵ I²⁵ †BX²⁵ P*
- 8] DY: X⁵ *R: P¹⁰ Γ¹⁵ Γ: 4²⁰ K²⁵ N²⁵ X²⁵ I²⁵ X²⁵ P† ‡‡ 4X:
- 9] B⁵ X¹⁰ Y¹⁵ X²⁰ R ‡‡RYX↑: ↑*X↑:
- 10] 4⁵ I¹⁰ K¹⁵ I²⁰ X²⁵ 4*IB²⁵ I:

Spirit Pond—3 (verso), Figure 5.

There are six lines, filling a little more than the upper half of the surface:

- 1] R I:
- 2] †X I K † X Y ↑ X : B X X
- 3] Y B : N I † X : 4 * I B : N I P * :
- 4] X Y I : Γ F : R ‡ I * P * X * ‡ I P N X : 20
- 5] K ‡ I 4 X Y X † Y : B X † I † X : * X † X P * I R : 25
- 6] Y I B X I † B X P * N Y : X * R : Y Γ Γ : 20

Transliteration. The runes in the inscriptions are of two types: alphabetic characters and numerals. The futhark used is clearly the standard or “Danish” futhark referred to earlier, which was developed shortly before 800 in Denmark and later spread to Sweden. The form of the Norwegian alphabet was rather different for some characters.

All 16 runes appear in the inscriptions; they are usually transliterated as follows:

f u þ o r k h n i a s t b m l y (?r)

There are certain peculiarities that deserve comment.

(1) The rune used here for *a* is totally unknown in Scandinavia. The usual form is in the standard alphabet and in the short-branch alphabet. The form occurs in futharks from Dalecarlia in Sweden after 1600; but even this is never dotted like the here. The only other inscription in which this rune occurs is the one on the Kensington Stone in Minnesota, where it is one of the many pieces of evidence that suggest a modern origin of the latter.

(2) There is an extra rune that does not fit into the younger futhark, . Like the preceding, this is known only from the Kensington Stone, where it occurs once and is usually interpreted as having the value *j* (*skjar* “skerries”). This value fits well enough in the places it occurs in the SP inscriptions, so we shall use it for the time being. It

occurs as follows: 1r.30 *jak*; 2.10 *sja*; 3r1.20 *sja*;
 3r4.28 *sakamjunk*; 3r8.19 *skualaljoosa*; 3v2.5 *naikjakta*. The regular position of before a vowel (*a u o*) agrees well with an intended value of *j* (recall that *j* here stands for the sound of English *y* in *yes*).

(3) The value of is given above as *þ*, i.e., the letter used in Old Norse (and Old English) manuscripts for the modern English *th* in *think* (sometimes also for *th* in *this*). But it seems quite certain that the carver of this inscription did not know this, since he several times follows it with the rune for *h* (), e.g., 3r2.12, 3r2.25, 3r7.25, 3v3.16, 3v4.12, 3v5.22, 3v6.9. In fact, it so occurs every time except

in 3r1.9 and 3r2.4-6. In the last named example it occurs in a word $\beta | \beta$ *þiþ*, which (as we shall see) is probably intended to be *ded*, i.e., “dead,” a form that occurs also and only on the Kensington Stone. The correct Old Norse form here would be *daup* (plus some inflectional suffix). The use of β for initial *d* in this word suggests that the carver did not know the difference between the two sounds. On the Kensington Stone the same feature occurs, not only in this word, but in the word for “day,” ON *dag* written $\beta \times \psi *$ *þagh* (cf $\uparrow \chi \uparrow *$ *takh* here). The rune for *h* is also used after *t* in 3r9.13 $\uparrow * \psi \uparrow$ *that*, where it would scarcely occur in Old Norse. We shall therefore transcribe β as *d*, not as *þ*.

(4) The rune for *n* is written in two distinct ways, the standard \dagger on SP-3 and the short-branch \dagger on SP-1 and SP-2. This is of no great moment, since both forms were used in the eleventh century, and are found in modern books on the runes. However, it suggests that possibly SP-3 was carved by a different person from the other two. There are a number of differences in the execution; SP-3 is carved between horizontal lines, is generally rougher and more poorly carved than the others; it is the only one that has macrons above some of the letters.

The numerals are a prominent feature of the inscriptions, occurring both on SP-1 and SP-3. They offer no particular problem in decipherment, since they follow exactly the system of the Kensington Stone, which by now is well known. They occur as follows: 1r.13-15 $\overline{\Gamma \Gamma \Gamma}$ *1011*; 3r2.1-2 $\overline{\Gamma \mathbb{E}}$ *17*; 3r3.9-10 $\overline{\Psi \Psi}$ *1010*; 3r4.1-2 $\overline{\Gamma F}$ *12*; 3r4.14-15 $\overline{\Gamma F}$ *12*; 3r4.21 $\overline{\Psi}$ *10*; 3r8.8-10 $\overline{\Psi \Gamma \Gamma}$ *1011*; 3v4.5-6 $\overline{\Gamma \mathbb{E}}$ *17*; 3v6.18-20 $\overline{\Upsilon \Gamma \Gamma}$ *1011*. As is obvious, there are two kinds of numerals: simple numbers (*10*, *12* twice, *17* twice) and dates (*1010*, *1011* three times). That the latter are intended as dates is underlined by their being preceded three times out of four by the

word *ahr*, which (if we may anticipate the interpretation) is clearly intended to be the Old Norse word *ar* "year" and is also spelled *ahr* on the Kensington Stone.

Finally, we must consider the punctuation marks. All three stones make use of two dots, one above the other, to mark off what appear to be words. This is a well-known feature of the younger runic inscriptions. We shall transliterate them with an open space. At the ends of lines the absence of dots indicates that the words run over, so that these are here transcribed with hyphens. The lines above the letters are transcribed as on the inscription.

We are now in a position to transliterate the inscriptions, and in doing so we will follow the numbering of the transcriptions above.

Spirit Pond—1r. Figure 1.

- 1] *hoob*
- 2] *uinnant 1011*
- 3] *tka tuau*
takh
- 4] *jak*

Spirit Pond—1v. Figure 2.

miltiaki

Spirit Pond—2. Figure 3.

- 1] *norkslokk*
- 2] *sja k*

Spirit Pond—3r. Figure 4.

- 1] *sikaŕumodín kilsa sjā*
- 2] *17 did haladhír miþainbad-*
- 3] *hum ahr 1010 uiulisa suitŕk*
- 4] *12 risi uist 12 nor 10 sakamj-*
- 5] *unk skikhilman haakon fan*
- 6] *hrtnikln at uist baalaaka*
- 7] *silka kiysŕrikn mibainbadh-*
- 8] *um ahr 1011 skualaljoosa*
- 9] *bāmaŕoormat that*
- 10] *siklāshibi*

Spirit Pond—3v. Figure 5.

- 1] *ri*
- 2] *naikjakta baa-*
- 3] *m̄b uin̄a shib uidh*
- 4] *aki 17 roihdhahoikua*
- 5] *koi sakank baninā hālādhir*
- 6] *mibainbādhum ahr 1011*

Interpretation. SP-1r is basically a map with legends.

(1) *hoob* can be interpreted as *hóp* “land-locked bay,” a word well known from the Norse sagas about the discovery of America, specifically *Karlsefni’s Saga*, where it says (ch. 9): “one could not enter the river except at high tide, so Karlsefni and his men sailed into the mouth of the river and called it ‘in the bay’.” The carver clearly intended the word to apply to Spirit Pond and its outlet, since it is placed right below this on the map, and thereby to mark this body of water as the “Hóp” of the sagas, concerning which there has been much controversy in modern discussion. The spelling *b* for *p* is normal in the standard younger runes, but the writing of two *o*’s (to mark length) is unknown in runic inscriptions, and is not found in manuscripts until much later.

(2) *uinnant 1011* is probably intended to be *Vinland 1011*, thereby marking the area around Popham Beach as the land explored and named by Leif Ericson, as told in the sagas. The use of *u* for *w* (later written *v*) is normal, as is the use of *t* for *d*; however, the second *n* is clearly a carver’s lapse for *l*, as noted earlier. The date 1011 brings the event here commemorated within the usual chronology of the sagas. Leif’s voyage was in 1000 according to *Karlsefni’s Saga*, in 1002 according to the *Greenland Saga*. The later voyages followed in succession until Karlsefni’s expedition in the years 1009–1013. (The dates are of course uncertain, since they are not stated in the sagas and are based on inferences derived from the sailing directions.)

(3) *tka tuau takh* makes no sense as it stands. One can guess that the last word is intended to be ON *dagr* “day”; *t* for *d* is normal, *kh* for fricative *g* is highly improbable at this period (*k* is normal, *h* is sometimes used, but not the two together). Its form is accusative singular. If the preceding word is intended to be the word for “two” (ON *tvau*), it is impossible with *takh*, since it is neuter plural in form. The

first word looks like a mis-writing for *tak*, the same word as *takh*, i.e., “day.”

(4) *jak* is not a word in Old Norse. It could be intended as the Old Swedish or Old Danish *jak* “I,” for which ON writes *ek*.

SP-IV: *miltiaki*. There is no ON word to which this corresponds, no matter how the letters are interpreted: *mildiaki*, *mildiagi*, *miltiaki*? It is conceivably interpretable as *mildi Aki* “generous Aki,” but this is highly improbable, since this form would be used only in address. Besides, one would expect an introduction of a person so named, and some context for the message. Since there are no intervening dots, one would suppose that it is a single word. There ought to be some relation of the message to the pictographs, which portray various animals, a (woman’s?) face, a boat with oar, a bow and arrow, and a hide. These are presumably intended to portray the life of the Indians whom the Norsemen met. After the runic word(s) there are two ears of grain, reminiscent of the description of Vinland as having self-sown wheat; in front there are some vague lines that could be a bunch of grapes, to represent the other product mentioned in the sagas. Such pictographs are virtually unknown in Scandinavian runic inscriptions. Finally, there are two symbols, mentioned above, which have no significance in terms of runic practice. They are not known to be magic or cryptic symbols from Scandinavian runic stones.

SP-2: The first line seems to be independent of the second, though there are no separators. It is not an ON word. The best one could do to interpret it would be to assume that *ks* is miswritten for *sk* and that *l* should have been *ƿ* *f*. These are both improbable, in terms of Scandinavian runic inscriptions, but at least one comes up with two words: *norsk folk*. In modern Norwegian this means “Norwegian people,” but the word *norsk* did not exist in Old Norse; the word was *norrann*. *Sja* is an Old Norse word, in fact two of them: the verb “see” in the infinitive and the pronoun “this” in the masculine nominative singular. Neither one makes any sense here. The *k* that is set off as if it were a separate word could be intended as *ek* “I”, but this would not fit grammatically with the infinitive *sja*: in ON it would be *sé ek* “I see.”

SP-3. The sixteen lines on both sides of this stone appear to tell some kind of story about a sailing expedition in the years 1010 and 1011, with reference to a group (or groups?) of persons having 17 members and give some sailing directions. This information can only be derived from the numbers and some isolated words that make sense. We shall list these first:

sja 3r1 “see” or “this,” without any grammatical context, as on SP-2;

did 3r2 is reminiscent of the Kensington Stone *ded*, a highly unlikely form in Old Norse, for “dead,” as noted above;

risi 3r4 “journey” is not an Old Norse word, but was borrowed as *reisa* from Middle Low German *reise*; it is common in modern Scandinavian (note that the form *rise* occurs on the Kensington Stone in the same context);

uist 3r4 and 3r6 could be ON *vestr* “west,” since it occurs right after *risi*, but the form is incorrect (note on the Kensington Stone: *west*);

at 3r6 could be the preposition *at* “at, to, toward,” but if it is construed with *uist* “west,” the form of the latter should be *uistri* (ON *at vestri*).

nor 3r4 could be ON *norðr* “north,” but the form is incorrect for Old Norse, which did not drop the last two consonants (note on the Kensington Stone: *norr* twice, the modern Swedish form);

haakon 3r5 is an authentic Old Norse name, but the use of two *a*'s is modern and certainly did not occur in Old Norse inscriptions of the eleventh century; the name is preceded by the word *skikhilman*, which sounds vaguely like a title, with *-man* as its suffix, but there is no Old Norse word *skikhil* and the correct Old Norse for “man” is *maðr*, with *mann* as an accusative;

fann 3r5 could be the Old Norse *fann* found (note that it also occurs on the Kensington Stone, as does the form *man* in the same line);

ahr 3r3, 3r8, 3v6, each time followed by a date, is clearly the word “year,” Old Norse *ár* (written *ar* in the mss.), here *ahr* as on the Kensington Stone, a spelling not found in the Middle Ages at all;

that 3r9 could be Old Norse *þat* “that” or “it,” but it does not seem to refer to anything, unless it is the next word, in which case it is grammatically wrong;

siklashibi 3r10 could be intended either as one word meaning “sailing ship,” in which case its form would probably have been *siglingaskip* (runic: *siklinkaskib*), or it could be the phrase “sail (a) ship,” which is modern Scandinavian, but improbable in Old Norse; here and at 3v3 what appears to be intended as “ship” is spelled *shib*, where the *b* is expected, but the *h* is quite unlikely in Old Norse except as a pure spelling error;

uina 3v3 could be Old Norse *vina* “friends” in the genitive plural or *vinna* “gain, win,” but there is no appropriate context for either meaning;

uidh 3v3 could be Old Norse *við*, though the writing of *ph* (here transcribed *dh*) is quite impossible in the 11th century;

aki 3v4 appears to repeat the name we suggested as a possibility on 1v above.

Aside from these isolated words, the text consists of “words” that are neither Old Norse nor apparently anything else. Several of them contain sequences of sounds that do not exist in any language within one word (*suitnk* 3r3, *hrtnikln* 3r6, *kiyslrikn* 3r7, etc.). There are certain patterns that recur, the most striking being *mibainbadhum*, which occurs three times (3r2, 3r7, 3v6), always before the word *ahr* and a date, and twice (3r2, 3v6) after the word *haladhir*. One might suppose that this meaningless sequence contained the word *bapum*, which in Old Norse could mean either “we asked” or “for both,” but neither fits into any context. *Haladhir* could be either the verb *hala* “haul” (as past or participle) or intended as *halir* “men,” but again these make no sense. The carver had a particular fondness for double vowels, especially *aa* and *oo*, which are definitely non-runic, and extremely rare even in the later manuscripts. He also seems to have repeated certain sequences in various orders, e.g., *sika-* 3r1 *kilsa* 3r1 *silka* 3r7 *sikla-* 3r10; *baa-* 3r6 *ba-* 3r9 *baa-* 3v2; *roi-* 3v4 *-hoi-* 3v4 *koi-* 3v5, none of which are found in Old Norse.

It is therefore impossible to read any clear message from the text as it stands. One naturally asks whether some other principle should be applied, such as a cipher or code. There is no evidence of the types of ciphers mentioned above, which are the usual ones in some runic inscriptions. The fact that a few words are interpretable, such as *hoob* and *uinnant* on SP-1r, and a few on the other two, probably precludes

any possibility of the whole text being in code. Either the text would be wholly gibberish, so that one could look for a scrambled alphabet, or else it would make sense as it stands. One cannot of course preclude the possibility of some kind of cryptogram, but in that case it falls outside the realm of authentic runic inscriptions, none of which have so far been shown to contain cryptograms, in spite of claims to the contrary.

Dating. Since the inscription repeatedly dates itself to 1010 and 1011, or claims to report on events occurring in those years, we must consider it from the point of view that it could have been carved in those years. We shall look at (a) the runes, (b) the numerals, (c) the language, and (d) the message.

(a) *The runes*, with two exceptions, are those of the so-called long-branch “Danish” futhark, which was popular in Denmark and later in Sweden. In an eleventh-century inscription by Norwegians or Icelanders we would have expected the Norwegian futhark, which replaced the long-branch ✴ *n*, † *l*, and ↑ *t* with short-branch ⋈ *n*, † *l*, and ↑ *t* (M. Olsen, vol. 5, p. 243). The first is used in both forms in SP, but the latter are only long-branch. The fact that the *a*-rune has a form which is nowhere attested in Scandinavia (✴) is highly suspicious. The occurrence of a *j*-rune makes it impossible to date this inscription to the eleventh century, or, indeed, to any medieval alphabet. There was not in the roman or the younger runic alphabet any symbol for *j*; until the time of the French philosopher Ramus (1515–1572) the vowel *i* and the consonant *j* were written alike. There is the further fact that the rune used here to represent *j* does not occur in Scandinavia. It is highly instructive to note that these precise deviations also occur on the Kensington Stone and only there. The major difference between the alphabet there and in SP is that the latter lacks the “dotted” or “pointed” runes, which began coming into use around 1000 A.D.

(b) *The numerals* are obviously identical in principle and form to those of the Kensington Stone. Much has been made of the fact that in certain post-medieval works on the runes, such as the *Fasti Danici*

of 1642, by the Danish scholar Ole Worm, a similar set of numerals is listed among those used on the so-called “runic calendars” of Scandinavia. One can read, for example, in Holand’s *The Kensington Stone*, page 128, about this work and its “runic numerals.” It is, however, a misnomer to call these numerals “runic,” since they do not in fact occur in any runic inscription and have an entirely different origin from the runes. The confusion is due to the fact that they vaguely resemble runes and that Worm puts them together with runes into a single table. Worm’s table is merely a list of various ways of indicating the 19 “golden numbers” of the perpetual calendars of the Middle Ages and later. The basic method was to use the roman numerals I–XIX; but for simplicity in carving and writing these could be replaced by other systems, one of which employed perpendicular staves with bars to the right. This system originated in central or southern Europe and is well known in Germany, Netherlands, and Scandinavia from the late Middle Ages, as shown by the Swedish authority on this topic, N. Lithberg, in his work *Computus* (Stockholm 1953, pp. 98–99). He demonstrates that the system is based on the roman numerals, and reproduces a table showing its many variants from a work by E. Schnippel, *Die englischen Kalenderstäbe* (Leipzig 1926): the half-circle for 5 ($\overline{\text{P}}$) is simply a roman V placed sideways on the staff.

In Scandinavia it became popular to replace these numerals with the runic futhark of 16 runes (adding three made-up runes for the missing three). In this way arose the misunderstanding that these numerals had something to do with runes, as Worm thought; as the facsimile reproduced by Holand on page 129 shows, they were used primarily in manuscripts in roman letters. The introduction of the runes in place of roman numerals was part of the popularization of these calendars in the form of wooden sticks (clogs) in Scandinavia; it was easier to carve runes than numerals. Even assuming that the numerals occurred on any of these, they are quite unlikely to have been in use in 1011, when the Norsemen were just barely converted. The earliest known “runic calendar” is from late thirteenth-century Sweden. For details see Elisabeth Svärdström: *Nyköpingsstaven och de medeltida kalenderrunorna* (Stockholm 1966).

Beyond these facts come the peculiar misinterpretations of the numerals which are common to the Kensington Stone and the SP-stones, and have been adequately documented by Erik Wahlgren (1958: 117–119). The digits are treated as if they were part of the Arabic system, e.g., P P is used to mean 1010, not 20 as the Roman system would demand. While it is true that Arabic notation was introduced into Spain in the tenth century, it did not reach Scandinavia until centuries later, and it is nowhere used in either a runic inscription or a manuscript from this period. It is further true that no runic inscription from the Viking Age and practically none from the Middle Ages is dated; when dates occur, they are either in roman numerals or in words (Musset 1965: 255). The same is true of documents on parchment when these became common after 1150 A.D.

Accordingly, the numerals by their form, their use, and their presence virtually exclude any possibility that these are eleventh-century inscriptions.

(c) *The language.* Since only single words can be identified, any judgment of the language has to be fragmentary. It is basic to note that not one of the identifiable words occurs in a sentence. For this reason they have no grammar whatever, as they would inevitably have if they were written by real people writing their own language. As noted earlier, the words stand out like sore thumbs in a sea of gibberish. The only ones that are acceptable as possible spellings of actual Old Norse words are: *uinnant* for *Vinland* (if we accept the emendation of *l* for *n*), *takh* for *dag* (though the *h* is peculiar), *uist* for *vest*, *fan* for *fann*, *at* for *at*, *uidh* for *vid* (though again the *h* is peculiar). The words *did*, *ahr*, *nor*, *shib*, and the names *Haakon* and *Hoob* for *dauð(r)*, *ár*, *norðr*, *Hákon*, and *Hóþ* are spelled in unprecedented and unexpected ways. The words *risi* and *norsk* are not Old Norse words, however well known they are today in Scandinavian.

To anyone who is familiar with the language of the Kensington inscription the striking similarity is immediately evident. Every one of the words listed in the preceding paragraph, except *Hákon* and *Hóþ*, occurs also on the Kensington Stone. Not only that: the spellings are virtually identical, given the slight differences in the two alphabets used:

KS: *winland dagh ded ahr rise west norr fan at skip wed*

SP: *uinnant takh did ahr risi uist nor fan at shib uidh*

The difference is that on the Kensington Stone these words fit into sentences and make sense in terms of Scandinavian grammar, at least of modern Swedish. Here they do not.

The similarities that have accumulated so far between the stones of Kensington and Spirit Pond are of course more than just a funny coincidence. No one can question that there is an intimate relation between them. We shall discuss what it is after having considered the intended message.

(d) *The message.* The purpose of these stones could hardly be made clearer than is done by the map and the pictographs, plus the legends of the former. This was to establish the Popham Beach area as the landfall of Thorfinn Karlsefni, whose voyage to the place called Hop in the sagas can indeed be dated to 1010 or 1011, more or less. Since the Kensington Stone makes reference to the voyagers as having come from "Vinland to the west," one can hardly see this inscription as anything but an attempt to establish a base in New England for the alleged Kensington party. There is, of course, a major discrepancy here: the Kensington Stone dates itself to 1362, these inscriptions to 1010-11. There is a gap here of 350 years, which is indeed a remarkable period of time during which one must imagine a tribe of Norsemen as having survived in Maine before migrating to Minnesota. Their fate, one would think, might have been sealed by the Indians in both places. But remarkably enough, they did all this without leaving any of those traces of settlement, either in Minnesota or Maine, that are so richly exemplified in Greenland, where we know that they were indeed living during this period. And without leaving any other trace of information in the written sources than these poor inscriptions which testify if anything to mental and linguistic degeneration from their state before immigration.

Conclusions Concerning the Spirit Pond Inscriptions

A careful examination of the Spirit Pond inscriptions leads us to the following conclusions: (1) The runes employed in the carving are not those that were in use by Norwegians or Icelanders in the eleventh or later centuries. (2) Two of the runes are quite unknown in

authenticated Scandinavian inscriptions from any age. (3) The use of the so-called “runic” numerals is inconsistent with the practice of runic carvers in Scandinavia, who did not date inscriptions, nor use the Arabic principle of numbering, nor employ this type of numeral except very rarely, and much later, in calendars. (4) The spelling of those words that can be identified as Old Norse is mostly inconsistent with runic as well as scribal practice in this period, and employs devices such as vowel doubling which did not come into use, if at all, until much later. (5) The words that can be identified are limited to words that can also be found on the Kensington Stone in Minnesota, which is itself regarded by competent authorities as a modern artifact. (6) The identifiable words do not have grammatical forms or fit into contexts that are recognizable as Old Norse, a language well known from a multitude of inscriptions and texts. (7) The rest of the text is gibberish as it stands, which leads one to suspect the carver of either being ignorant, or of having deliberately created some kind of mystification, either of which is more probable in a modern hoaxer than in a medieval runic carver.

Every indication therefore points to the conclusion that the Spirit Pond inscription could not have been carved by Scandinavian Vikings in the Middle Ages.

The one solid fact that emerges from this examination of the inscriptions is that they cannot be explained without taking into account the Kensington Stone inscription in Minnesota. One’s conclusions from this fact will depend on how one views that stone. From 1898, the year of its discovery, down to the present day, a solid phalanx of scholars specializing in Old Norse and runology have pronounced the Kensington Stone to be a modern artifact. In Scandinavia these include the greatest living experts in runology, Erik Moltke in Denmark and Sven B. F. Jansson in Sweden, each of whom has written a detailed refutation. In the United States the runologist Erik Wahlgren of UCLA and the historian Theodore C. Blegen of the University of Minnesota have published book-length demonstrations of the falsity of Holand’s claims. Every one of the arguments leveled against the runes, the language, and the message of that stone applies with equal force to these stones and for the same reasons. It is, therefore, inevitable that those who, like the present writer, agree with this judgment will have to pronounce the Spirit

Pond stones to be modern artifacts. Those supporters of the Kensington Stone who have refused to accept this virtually unanimous opinion will, of course, equally refuse to accept our judgment here. I do not know what kind of theory they will launch to rescue this inscription from limbo. The fact that the message is garbled naturally handicaps the judgment on either side, but that which can be read is at least not Old Norse.

It is tempting to speculate on the methods and motives of the carver, but so far there is no evidence beyond that which is contained in the inscription itself. The carver could hardly have been ignorant of the Kensington Stone; the coincidence is too tremendous. That two inscriptions thousands of miles and hundreds of years apart should use almost exactly the same erroneous alphabet, the same peculiar and incorrect Old Norse words, and a set of utterly improbable numbers, while telling a similar and equally unlikely story is too much to accept. I suggest that the carver could not possibly have known a Scandinavian language, but that he had read a book about the Kensington Stone written in English. Since the first such book was Holand's work of 1932, this establishes a date after which the stones must have been carved. The carver could have been any one of the many enthusiasts for runes and the Norse discovery who have been anxious to find archeological confirmation of the latter. Or he could have been a joker who thought the whole business ridiculous and decided to carve some stones to "puzzle the brains of the learned." By this time the number of supposed runestones in America is becoming legion; not one has been authenticated, but their number goes on growing and providing local patriots with show pieces while scholars shake their heads.

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
There is no adequate book on runic writing in English. The brief manuals by Ralph W. Elliott and Sven B. F. Jansson are good, but incomplete. The best short handbook is by Lucien Musset, *Introduction à la Runologie* (Paris 1965); another valuable volume is Klaus Düwel, *Runenkunde* (Stuttgart 1968). Otherwise the standard handbook is Otto v. Friesen's *Runorna* (*Nordisk Kultur*, vol. 6, Stockholm 1933), containing articles by leading Scandinavian authorities. No handbook, however, can replace close familiarity with the actual inscriptions themselves. The Norwegian inscriptions, except for the recent Bergen finds, are published in *Norges*

innskrifter med de yngre runer (eds. Magnus Olsen and Aslak Liestøl, 5 vols., Oslo 1941–1960); the Swedish inscriptions in the many volumes of *Sveriges Runinskrifter*, so far 13 volumes (Stockholm 1900–1964); the Danish inscriptions in *Danmarks Runeindskrifter*, 3 volumes (eds. L. Jacobsen and E. Moltke, Copenhagen 1941–1942); the Icelandic inscriptions in *Íslands Runeindskrifter* (ed. Anders Bæksted, Copenhagen 1942).

Scholarly works on the Kensington Stone are *The Kensington Stone: a Mystery Solved* by Erik Wahlgren (Madison 1958), *The Kensington Rune Stone: New Light on an Old Riddle* by Theodore C. Blegen (St. Paul 1968), “The Ghost of the Kensington Stone” by Erik Moltke (*Scandinavian Studies*, vol. 25: 1–14, 1953), and “‘Runstenen’ från Kensington i Minnesota” by Sven B. F. Jansson (*Nordisk tidskrift*, vol. 25: 377–405, Stockholm 1949). Other references are H. R. Holand, *The Kensington Stone: a Study in Pre-Columbian American History* (Ephraim, Wis. 1932) and *Explorations in America Before Columbus* (New York 1956).

An invaluable source of information on the Scandinavian Middle Ages is *Kulturhistorisk leksikon for nordisk middelalder* (Copenhagen 1956 ff.) which has now reached 16 volumes (A–St). Signed articles by leading experts include such relevant topics as language, runes, calendars, numerals, and inscriptions, with bibliographies.

POSTSCRIPT

After preparing the preceding report, I read an attempted interpretation of the Spirit Pond stones by Donal B. Buchanan, published by the New England Antiquities Research Association (*The Spirit Pond Runestones*, NEARA 1972, pp. 17–26). Aside from the words identified above as potentially authentic, Buchanan reads interpretations into the material described by me as “gibberish.” His method is simply to take a dictionary of Old Icelandic (Vigfusson and Cleasby) and leaf through it for words that vaguely resemble the ones on the stone. He does not understand the fact that every authentic inscription is written in a language, using the grammar and spelling that was customary at that time. It is not put together as a puzzle, but as a message in natural sentences. When he reads SP-1r3 as SVA: TVAU: THAGH; and translates it as “Thus, two Days,” he has (a) deliberately misread the “bind rune”  (which is not a bind rune anyway, since bind runes have to have a perpendicular stave in common) to make SV instead of TK (SV would be written ) , (b) produced a grammatical sequence that is impossible in Old Norse, since *tvau* is neuter plural, while *dag* is masculine singular accusative (it

would either be *tveir dagar* if nominative, *tva* [or *tvö*] *daga* if accusative), (c) produced a wholly improbable utterance (why would anyone ever say "Thus, two days"?). This is true of every suggestion made, aside from those already identified above. The "anagram" of *MILTIAKI* as *LITA-I-MIK* or *LITA-MIKI* to mean "beheld by me" (attributed, incorrectly, to Mongé) is an impossible bit of Old Norse. "Beheld" (if this verb could be used at all) would be *litinn* (m.) or *litit* (n.), the perfect participle, and "by me" could be *af mér*, but the combination is unlikely. If one takes it literally, one could get *lit á mik* "look at me," but this leaves an *i* unaccounted for and makes no particular sense. Besides, anagrams were not used in runic inscriptions.

What Buchanan and other untrained runic enthusiasts do not realize is the point I have tried to make in this report: Norwegians and Icelanders coming to North American shores in the year 1000 did not suddenly change their language and start talking or writing pidgin Old Norse when they stepped ashore. To judge if an inscription could have been written then, one has to have read extensively enough in Old Norse literature to know how they expressed themselves and what their language was like. It is not enough to pick out words from a dictionary. One has to know how they put words together into sentences and what the probabilities are of certain combinations of words. Such haphazard guesses concerning the meaning are a denial of everything that has been learned about language in general and about Old Norse in particular over the last 150 years.

Dr. Haugen's original report on the Spirit Pond rune stones to the Maine State Museum was edited by Mrs. Dena Dincauze of the Peabody Museum at Harvard University for publication in *Man in the Northeast* (4: 1972, pp. 62-85). This article has been adapted from that publication and appears here with kind permission of *Man in the Northeast*, Box 148, Fitzwilliam, NH 03447.

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Excerpt: Greek Manuscripts of the Ancient World

E. G. Turner

The questions palaeographers would above all like to have answered about a particular manuscript are two: firstly, where was it written? secondly, at what date was it written? I shall try to make explicit the assumptions on which palaeographers work when attempting to answer these two questions.

Actually, they rarely try to answer the first. The absence of criteria for determining the place at which a papyrus manuscript was written is a more serious impediment to knowledge than is commonly realized. It is a tenable hypothesis that some of the differences in modes of writing to be noted below arise from the practice of different scribal centres—practices perhaps in vogue at one and the same time. Documents found at Avroman, Dura-Europus, Qumrân, and Engedi shake the comfortable assumption of an earlier day that Greek documentary handwriting at any given date took a standard form throughout the Graeco-Roman world. We know from their contents that a number of documents found in Egypt were written outside Egypt (e.g. Ravenna, Side, Constantinople). But literary manuscripts rarely contain information of this kind. Though literary texts found in Egypt may have an origin as diverse as that of documents, only an analysis of variations in book technique and scribal practice will offer clues about that origin; and this analysis can start only by assuming parallel tendencies in both literary and documentary hands. On general grounds it is highly likely that some of the literary manuscripts found in Oxyrhynchus were copied elsewhere than at Oxyrhynchus. The place may have been elsewhere in Egypt (Alexandria especially) or outside Egypt altogether (Antioch, Rhodes, Athens, Rome). Of only two categories of papyrus manuscripts found in Oxyrhynchus may we say with some

probability that they were copied in Oxyrhynchus: the first consists of those manuscripts which were copied on the back of documentary rolls, above all if those documents concern the administration of other districts than the Oxyrhynchite nome; the second will be formed of those rarer cases when we can identify a single scribe as the copyist of more than one classical manuscript, and he writes a straightforward hand of no special elegance (Figure 7). In this second case confidence wanes when the handwriting reaches a high level of competence. Were the beautiful rolls of Aeschylus, of which Figure 1 is only a single specimen, copied in Oxyrhynchus or commissioned from Alexandria or even from a library outside Egypt? Does the same apply to the rolls of Sophocles represented by Figure 13? A positive answer in this case would be specially interesting because of the references by name in the annotations to scholars whose readings are cited. Was the "Coptic Uncial" (Fig. 10), the scribe of which also copied a manuscript of Apollonius Rhodius, penned in Oxyrhynchus or in Alexandria? Are all parchment codices found in Egypt to be regarded as written at centres outside Egypt? The assumption is commonly made that in Egypt, the home of the papyrus industry, papyrus not parchment would be used. But it is a guess only.

In R. Devreesse's list of Greek manuscripts¹ bearing a date, the first entry is the Dioscorides now in Vienna, Vindob. med. gr. 1 of A.D. 512. In the ancient world the writers of private letters (to judge from those that survive on papyrus) for the most part did not put a date on their correspondence; similarly literary scribes remain dateless, impersonal, even though one may occasionally relieve his feelings by adding to the end-title a sentence such as "Don't laugh at the writing." Very occasionally a "book-hand" scribe can be given a time and place. The writer of Figure 12 is locatable because he is associated with a known person.

In the absence of a written date archaeology may help. Because of the known eruption of Vesuvius the papyri from Herculaneum cannot be later than A.D. 79 (some of them may be very much earlier). Mere association of literary papyri with documents, however, in the archaeological record is of uncertain dating value.

1. R. Devreesse, *Introduction à l'étude des manuscrits grecs* (Paris, 1954), pp. 288 ff.

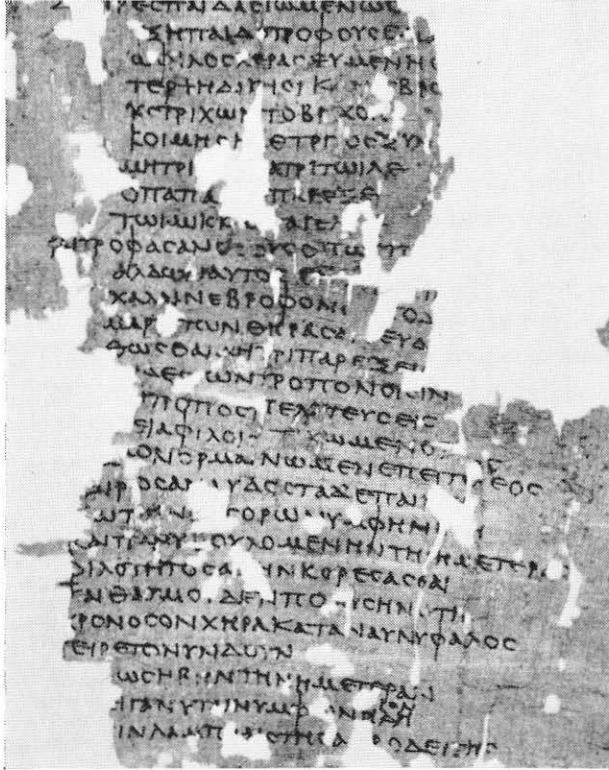


Figure 1. Aeschylus, *Dictyulci*. E.E.S. Oxyrhynchus, ii A.D. [24]. Detail.

Note: the number in brackets at the end of each caption refers to Prof. Turner's illustration number in *Greek Manuscripts of the Ancient World*. References and a detailed discussion of each manuscript are included in his original captions.

P. Vindob. G. 2315 was for long dated in the time of Augustus because it was “taken from a layer of papyri which belong to i A.D.,” but its true date is two centuries earlier. However, when documents and literary manuscripts were mixed together to make “cartonnage” for mummy casings, we may have greater confidence in using the date of the documents as a rough guide (at least as a *terminus ante quem*) to the date of the literary manuscripts. Both were regarded as waste paper and discarded at the same moment.

Our most trustworthy dates (on the basis of which our whole present dating structure rests) are derived from those examples in which the back of a papyrus roll (or very occasionally of a codex) has been reused. A dated document on the front (recto) of a roll, of which the back (verso) was used for a literary text, offers a date *after* which the literary text was copied. Conversely, a dated document on the back (verso) of a literary roll (unless the roll has been tampered with) offers a date *before* which the literary text was copied. There is no hard and fast rule for determining the time interval between the

two uses. From an examination in 1954 of a large number of documents where a date was given on both sides,² I concluded that the accepted rule of thumb of a fifty-year interval should be discarded. Reuse might be almost immediate or after an appreciable interval. The large number of documentary texts written after only a short interval on the back of official documents shows that there was no rule, as has been postulated by those familiar with modern bureaucracies, that documents should be left on file for fifty years and then released for use as scrap paper. A normal period to allow is of five to ten years. The palaeographer may in such conditions neglect this short interval. But if the document is a private one and has importance in proving a legal title, it might have been preserved much longer, as G. Cavallo has pointed out.³ In the second case, that of a literary roll which has afterwards been used for a document such as a dated or datable letter, there is a probability, which may differ from example to example, that a longish life should be assigned to the literary text, perhaps fifty, perhaps even one hundred years.

When none of these possibilities is available, an attempt at dating will begin by considering the material aspect of a manuscript: is the writing-material fine or coarse papyrus, skin or parchment? What is its size and format? Fashions apply to sizes and formats of manuscripts just as they do to hair-styles. A collection of the evidence is an urgent desideratum of palaeographers. Here we may simply note two cases in passing. In i B.C. and i and early ii A.D. rolls of relatively small height were in fashion for books of poetry (Fig. 2). One pattern for early papyrus codices offers a nearly square page (Fig. 3), another has a tall rectangular page (Fig. 4). In regard to

2. "Recto and Verso," *Journal of Egyptian Archaeology*, 40 (1954), pp. 102-6.

3. G. Cavallo, *Ricerche sulla maiuscola biblica* (Florence, 1967), p. 46 n. 3. He presumably has in mind such documents as P. Flor. i 24, 25, 51. It would be helpful if this observation could constitute a rule, but it does not. We do not know why the military archive P. Flor. ii 278 was kept for more than 55 years before reuse (iii 322); or why the marriage contract in P. Oxy. iii 496 was almost immediately treated as scrap paper (P. Oxy. i 34). A striking example of the need to examine each case is offered by an as yet unedited papyrus from Oxyrhynchus. On its recto are two copies of a petition dated A.D. 218, both subscribed by the petitioner. On the verso is a copy of an edict of the Prefect T. Pactumeius Magnus (A.D. 176-7). The edict had been issued more than 40 years at least before this copy could have been made.

ΤΟΝ ΛΙΓΘΟΝ ΑΙΤΗ ΚΗΝΤΑΝ ΑΝΝΑ ΚΟΥ ΚΑΜΥ ΚΟ
ΟΝ ΚΑΝΤΑ ΧΕΩΣ ΛΗΣΙΕ ΤΗΝ ΓΕΜΗΝ ΠΑΙΣΤΡΙΑΝ
ΟΚΟΥΤΕΡΟΙ ΚΙ ΖΟΥΣΙΝ ΟΙ ΤΕΤΕΙΟΥ ΝΙΚΟΣ
ΚΟΙ ΔΡΗΤΕ ΤΑΙΣ ΑΦΟΙΔΕΚΤΕΡΩΙ ΔΕ ΑΙ
ΚΗ ΜΕΝΤΑ ΜΗΝ ΔΕΛΤΟΣ ΚΗ ΝΕΤΩ ΚΑΛΙΝΩ
ΚΗ ΡΟΝ ΣΕ ΚΑΣΤΟΥ ΜΗΝ ΟΣΟΡ ΦΑΝΗ ΚΗ ΤΑ
ΠΡΑΤΙΚΕ ΧΑΜΕΥ ΝΗΣΤΟΥ ΕΚΙΤΟΙ ΧΟΝ ΕΡΑΜΗ ΚΟΣ
ΚΗ ΜΗ ΚΟ ΤΑΥΤΗ ΝΟΙΟΝ ΑΙ ΟΜΗ ΔΕ ΑΙ ΔΕ
ΠΡΑΨ ΚΙ ΜΕΝ ΟΝ ΔΕ Ν ΚΑΛΟΝ ΕΚ ΔΟΛΗ Ν ΕΥΧΩ
ΛΙ ΔΟΡ ΚΑ ΛΙ ΔΕ Σ ΔΩ ΤΑ ΡΩΤΕΡ ΑΙ ΤΟ ΛΙΟΝ
ΕΝ ΤΗ ΚΙ ΕΦΥΣ ΚΙ ΣΤΟΙ ΣΤΕ ΔΙ ΚΤΥ ΟΙ ΚΕ ΚΗ ΤΗ
ΤΗΣ ΑΙΚΥΘΟΥ Η ΜΕΡΩΝ ΤΗ ΚΗ ΣΤΙ ΠΑΝ ΤΙ ΧΡΩΜΕΣ Α
ΕΤΟΙ ΣΤΑΤΗ ΣΑΝ ΔΑ Δ Φ Α ΓΥ ΛΛ Α Β Ι Κ Η Ν Η Ν Ω Ν Α
ΜΗ Ν Δ Ε Μ Τ Η Σ Α Ν Τ Ω Ι Τ Α Ν Τ Α Τ Ε Ν Τ Α Κ Ι Γ Ζ Ω Γ Α
Τ Ρ Ι Θ Η Μ Ε Ρ Α Μ Ε Ρ Ω Ν Α Ρ Α Ι Μ Α Τ Τ Ζ Ο Ν Τ Ε
Τ Ο Ν Π Α Τ Ι Ο Σ Α Ν Τ Ω Τ Ο Ν Μ Ε Ρ Ω Ν Α Ε Τ Ι Ο Ι Μ Ε Σ Ε

Figure 2. Herodas, *Mimes*. B.M. Pap. Inv. 135 (Pap. Egerton). Meir (?), i/ii A.D., perhaps ± A.D. 100. [39]. Detail.

06
ΟΤΗ ΥΠΑΓΕΙ ΕΙΣ ΤΟ ΑΙΝΗΜΕΘΟΝ ΙΝΑ
ΚΛΑΥΣΗ ΚΕ· Η ΟΥΝ ΜΑΡΙΑ ΨΕΝΗ
ΘΕΝ ΟΙ ΠΟΥ ΗΝΙΕ ΚΑΙ ΙΔΟΥΣΑ ΑΥ
ΤΟΝ ΕΠΕΣΕΝ ΑΥΤΟΥ ΕΙΣ ΤΟΥΣ ΠΟ
ΔΑΣ ΕΓΟΥΣΑ ΚΕ· ΕΙ ΗΣΩ ΔΕ ΘΥΓΑ
ΜΟΥ ΑΠΘΑΝΕΝ Ο ΑΔΕΛΦΟΣ· ΙΣΟΥ
ΩΣ ΕΔΕΝ ΑΥΤΗΝ ΚΛΑΙΟΥΣΑΝ· Κ
ΤΟΥΣ ΣΥΝΕΛΗΛΥΘΟΤΑΣ ΣΥΝΑΥΤΗ
ΟΥ ΔΑΙΟΥΣ ΚΛΑΙΟΝΤΑΣ· ΕΞΑΡΧΘΗ
ΑΥΤΗ ΤΩ ΠΝΙΩΣ ΕΥΒΡΗΩΜΕΝΟΣ
ΤΟΝ ΚΑΙ ΕΙΠΕΝ ΠΟΥΤΕΘΙ ΚΑΤΑ ΙΔΥ
ΟΝ ΛΕΙΟΥΣΙΝ ΑΥΤΩ ΕΡΧΟΥΜΕΝ ΔΕ
ΕΔΡΑΚΥΣΕΝΟΣ ΕΛΕΓΟΝ ΟΥΝ ΟΙ ΙΟΥ
ΔΑΙΟΙ ΕΔΕΠΩΣ ΕΦΙΛΗ ΑΥΤΟΝ ΤΙ
ΝΕΣ ΔΕ ΕΠΟΝ ΕΞ ΑΥΤΩΝ ΟΥΚ ΕΔΥ
ΝΑ ΤΡΟΥΤΟΣ Ο ΑΝΟΙΞΑΣ ΤΟΥΣ ΟΦΘΑ
ΛΜΟΥΣ ΤΟΥΤΥ ΦΛΟΥΠΟΙΗΣΑΙ ΙΝΑΣ

Figure 3. Gospel acc. to St. John 11:31-7. Bibliotheca Bodmeriana, Pap. 2.
Provenance unknown, c. A.D. 200-50. [63]. Detail.

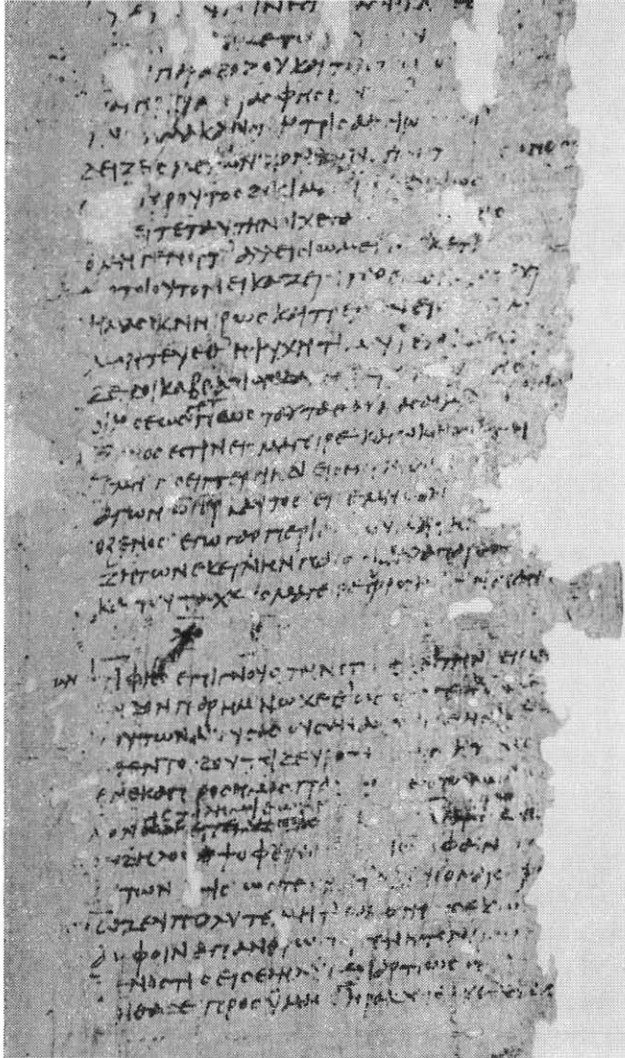


Figure 4. Menander, *Misoumenos*. B.M. Pap. 3077. Oxyrhynchus, iv A.D. [43]. Detail.

materials it may be worth noting what ink is used. Lustrous black betokens a carbon ink; a brown ink has probably been mixed from an iron salt or other chemical compound, and is likely to point to a later date (iv A.D. onwards).⁴

The content of the manuscript will occasionally be of use for dating. A manuscript cannot be earlier than the author copied

4. C. H. Roberts calls my attention to a dated instance of the use of metallic ink in A.D. 269 (P. Oxy. xx 2269, p. 142 n. 1).

(P. Oxy. 412, a copy of iii A.D. Julius Africanus, provided at the time of its publication a useful example of third-century writing) or the events described (P. Bodmer. xx, which on palaeographical grounds might plausibly be assigned to iii A.D., cannot be earlier than c. A.D. 306, the year in which its hero-bishop faced his persecutor, the prefect Culcianus). Similarly it may be possible to exploit fashions in "diplomatic" usage, such as the use of and form taken by abbreviations. The presence, for instance, of frequent lectional signs, accents, tremata, etc., contemporary with the manuscript will create a presumption that the text is not earlier than i v.c. and belongs to the Roman rather than the Ptolemaic period; the use by the scribe of the separating apostrophe between doubled consonants ($\alpha\lambda'\lambda\alpha$) will suggest a date later than A.D. 200.

To obtain a more precise result than is likely to be reached by any of these approaches it will be necessary to find a dated or datable handwriting which the piece under examination resembles. C. H. Roberts has discussed the method and given many suggestive examples in *Greek Literary Hands*. Confidence will be strongest when like is compared with like: a documentary hand with another documentary hand, skilful writing with skilful, fast writing with fast. Comparison of book hands with dated documentary hands will be less reliable. The intention of the scribe is different in the two cases; besides, the book-hand style in question may have had a long life. Even when both hands are of documentary type it is undesirable to attempt too close a dating. A manner of writing which a scribe learned in his youth he may still be writing in old age. For book hands a period of fifty years is the least acceptable spread in time. A palaeographer familiar with the material will refuse assent to a precise year date allocated to a manuscript simply by comparison with other texts and by no other criterion.

How are "resemblances" between handwritings to be judged? The first point of similarity to strike an observer will be in the forms of the letters. But taken in isolation this feature is too arbitrary to be trustworthy. Many critics have pointed out the flaws in the "test-letter" theory since F. G. Kenyon first formulated it in 1899 (*The Palaeography of Greek Papyri*, p. 73). The forms of letters must, as W. Schubart pointed out, be considered in relation to the manner of writing which they help to constitute. The letter-forms chosen by the

The Authors

Earl M. Herrick is an instructor in the Department of English at Texas A & I University (Kingsville, TX 78363), where he teaches linguistics and English and Spanish grammar. His research interests concern written language and linguistic theory in general, and he has read several papers on those topics. He has also written computer programs to simulate the process of reading, as well as programs for use in dialect research. He is now working on a comprehensive linguistic analysis of the writing system of English.

Einar Haugen is the Victor S. Thomas Professor of Scandinavian and Linguistics at Harvard University (Cambridge, MA 02138). He has taught seminars at Harvard in runic inscriptions and has just completed a book on the history of the Scandinavian languages, published by Faber and Faber, London. Among his previous books are *Language Conflict and Language Planning* (1966), *The Ecology of Language* (1972), *Studies Presented on the Occasion of His 65th Birthday* (1972), and *The Scandinavian Languages: Fifty Years of Linguistic Research* (1972). Dr. Haugen is a frequent contributor to American, Scandinavian, and international journals.

Eric G. Turner is professor of papyrology in University College London (Gower Street, London WC1E 6BT, England). He has been editing papyri since 1938 and has written a general book called *Greek Papyri* (Oxford and Princeton, 1967), as well as the work from which these excerpts are taken. Professor Turner is currently president of the International Association of Papyrologists.

Gay Beste Reineck is a practicing graphic designer (230 Seventh Avenue, San Francisco, CA 94118). For a number of years she has been interested in words as a form of visual expression. Some of her ideas have been incorporated into commercial work, other experimental ideas have appeared in various design publications.

This number of *Visible Language* has been composed in "Monotype" Baskerville type and produced by W & J Mackay Limited, Chatham, England, on Beaublade Nimrod Cartridge, 100gm². The layout is based on the original design by Jack Stauffacher of the Greenwood Press, San Francisco.

Kurzfassung der Beiträge

Übersetzung: Dirk Wendt

Eine Kategorisierung von Alphabeten und Schriften *von Earl M. Herrick*

Dieser Aufsatz beschreibt ein Kategorisierungs- oder Klassifizierungssystem zur Beschreibung von Alphabeten und zur Demonstration des unterschiedlichen Ausmaßes formaler Ähnlichkeit, die sie untereinander haben. Die Prinzipien dieser Kategorisierung sind weitgehend aus der Biologie entlehnt und werden kurz dargestellt. Dann werden drei Klassifikationsniveaus definiert. Für jedes Niveau beschreibt der Aufsatz die Art und den Grad der Ähnlichkeit, die Alphabete haben müssen, um auf dem jeweiligen Niveau in die gleiche Kategorie zu fallen. Diese Ähnlichkeiten werden demonstriert an verschiedenen Arten von Kategorien und einigen Alphabeten, die in sie gehören. Es wird eine Reihe von Problemen angesprochen, die beim Vergleich von Schreibsystemen auftreten und weitere Untersuchung erfordern.

Der Runenstein von Spirit Pond, Maine, *von Einar Haugen*

Der Verfasser berichtet über seine offizielle Untersuchung der Inschriften der drei Runensteine, die 1971 von Walter J. Elliott in der Nähe von Spirit Pond, Maine (USA) entdeckt wurden. Bei der Echtheit der Steine als Werke aus der Wikingerzeit ging er in drei Schritten vor: (1) Transskription der Runen, (2) Übertragung in das lateinische Alphabet, und (3) Übersetzung der Bedeutung der Inschriften. Die Beziehung der Runen (als alphabetische Zeichen) zur Geschichte der skandinavischen Sprachen wird umrissen, und spezielle Probleme dieser Inschriften werden besprochen: (1) Die Runen sind nicht die gleichen, die im 11. Jahrhundert oder später gebräuchlich waren, (2) die Rechtschreibung und der Gebrauch von Ziffern in Runenschrift stimmt nicht mit der Praxis im Runen- und Schriftgebrauch überein, (3) die grammatikalische Form läßt sich nicht als Alt-Norwegisch identifizieren, (4) Besonderheiten deuten auf direkte Beziehungen zur Inschrift des Kensington-Steins in Minnesota. Schlußfolgerung: Die Inschriften können nicht von skandinavischen Wikingern im Mittelalter geschnitten worden sein, und sind wahrscheinlich 1932 entstanden.

Résumé des Article

Traduction: Fernand Baudin

La classification des alphabets et des écritures
par Earl M. Herrick

L'article propose une taxonomie ou système de classification permettant de classer les alphabets et d'exprimer leurs parentés morphologiques. Les principes, empruntés à la biologie, sont brièvement exposés. Trois niveaux taxonomiques sont définis en fonction de trois niveaux de parentés. Pour chaque niveau, la nature et le degré de parenté requis pour qu'un alphabet fasse l'objet d'une catégorie (ou taxon) sont précisés. Des exemples montrent des catégories et les alphabets qui en relèvent. Plusieurs difficultés ont été rencontrées dans la comparaison de systèmes d'écriture et exigeront plus ample examen.

Les inscriptions runiques de Spirit Pond,
dans le Maine, *par Einar Haugen*

L'auteur fait le compte rendu des recherches, officiellement entreprises, qu'il a faites concernant les inscriptions runiques sur trois pierres découvertes en 1971 par Walter J. Elliott près de Spirit Pond, dans le Maine, USA. L'origine viking de ces pierres a été examinée (1) par la transcription même des runes, (2) par leur translittération en caractères latins et (3) par le sens des textes. L'article décrit aussi les rapports des caractères (alphabétiques) runiques avec l'histoire des langues scandinaves, ainsi que certains aspects particuliers de ces inscriptions. A savoir: (1) Les runes considérées ne sont pas du XIe siècle, ni des siècles postérieurs, (2) L'orthographe et les chiffres ne sont pas conformes aux usages runique ni scriptuaire connus, (3) La grammaire n'est pas celle du scandinave ancien, (4) certains détails renvoient directement à la pierre de Kensington, Minnesota. Conclusion: les inscriptions considérées ne peuvent être l'oeuvre de Vikings et sont probablement postérieures à 1932.

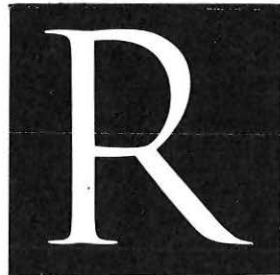
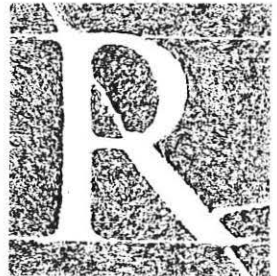
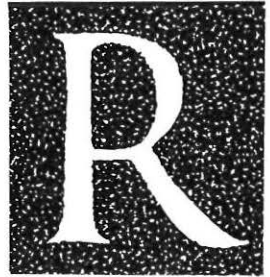
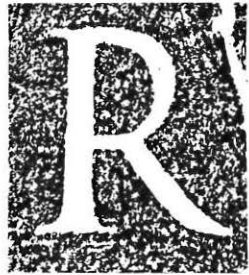
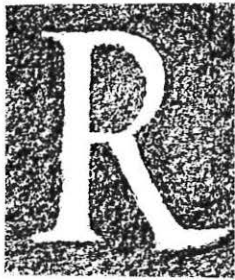
Inscriptions américaines anciennes, *par Francis Duval et Ivan Rigby*

Une série de reproductions de pierres tombales américaines des XVIIe et XVIIIe siècles, précédée d'une introduction concernant leur technique, leur présentation et d'un plaidoyer en faveur de la conservation de ces témoins historiques du folklore américain.

chisel-edged brush and writes letters which are worthy of a place with any inscription from Imperial Rome. Other minor points could be mentioned; suffice it to say that I regret that a work as important as *Origin of the Serif* should be put down on minutiae when its larger message is so needed.

Robert J. Palladino
Department of Calligraphy and Paleography
Reed College, Portland, OR 97210

Figure 1. Ten R's from Walter Käch, *Rhythm and Proportion in Lettering*, and a Trajan R (lower right).



Flat-topped A, M, and N should be and are more abundant for two reasons: (1) they are mostly the result of less skilled *hard-tool* writers, even though using a flat brush, and (2) Roman inscriptions of small size far outnumber those of large size. This does not mean that there are no flat A, M, and N's taller than about two inches, but it does mean that pointed tops exist only rarely in small letters.

In his review Hochuli gives no clue as to the size of A's he places alongside the Trajan A. I have heard Father Catich lecture and have seen him demonstrate the writing of Imperial majuscules. One thing Catich insists on (as did Edward Johnston and Rudolf Koch) is the importance of size and how it changes letters and letter parts; that Trajan letters are apt for their size of four and one-half inches; that their appearance would change if made, say, two inches tall; and that if Trajan letters were pantographically reduced to 12-point type, the result would be a monstrous injustice to real Trajan letters.

Why did Hochuli, in his attempt to discredit Trajan letters, use letter A which contains only a bar and obliques? Why not use R, for example, which to my mind is *the* most characteristic roman letter and which contains such a beautiful and subtle balance of so many different rhythms? The two A's which Hochuli used are taken from Käch's book. Allow me, using the same source, to make a comparison using not two but all the R's found in Käch's reproductions of first-century inscriptions, reproducing them all alongside a Trajan R (Figure 1). Even an inexperienced student can see the superiority of the Trajan R in respect to all the characteristics of a classical model.

Hochuli states that the theory of the brush as the formative factor behind *script. mon.* is not new and that Käch "was the *first in Europe* to urge this theory *emphatically*. . . ." The fact is that Lethaby, Hübner, Egbert, Ritschel, et al., had, in the last century, supposed the brush to be the tool shaping inscriptional letters. But no one until Catich published *Origin of the Serif* had anything to say on just how the brush was manipulated to fashion Imperial *script. mon.* Hochuli admits that Käch did not do the letters with the brush himself, but only put it forward as a theory. Catich on the other hand—a one-time Chicago signwriter and show-card artist turned professor/paleographer with years of study and research of Imperial inscriptions in Italy, Greece, Spain, France, and Yugoslavia, along with thousands of meters of rubbings and squeezes—can and does demonstrate that *script. mon.* was the directly written result of skilled Roman signwriters. Others who link the brush to roman capitals do so in the techniques of *filling-in* and *building-up* of letter parts, thus not truly written. Catich demonstrates the unique qualities and manipulatory kinetics of the

C. During the Imperium the composition of such inscriptions followed a delicate and rigid protocol not only in the wording, but in the size of the letters, in the eulogistic phrases, in the use of titles, abbreviations, etc.—a task calling for the greatest scribal competence.

Neither Hochuli nor Käch tell us which inscription is better than the Trajan. Both make blanket statements that the inscriptions of the first half of the first century—chiefly Tiberian—are best. We can assume that the inscriptions Käch reproduces in his book, *Rhythm and Proportion in Lettering*, are the superior examples. However, it is painfully evident that none of these equals the classic elegance, precision, balance, and restraint of Trajan letters.

Moreover, examples shown by Käch include relatively few letters for comparative purposes. One of the longest and best inscriptions shown (page 51) has 28 letters: 8 I's, 4 V's, 3 C's, 3 N's, 2 A's, H's, R's, and an S and a Y. In this inscription 11 letters, present in the Trajan inscription, are lacking—B, D, E, F, G, L, M, O, P, Q, and X. On the other hand, the Trajan inscription contains 203 letters, punctuation, and numerical marks, among which are: 18 A's, 14 E's, 11 M's, 11 O's, 9 R's, 14 S's, 18 V's, etc.—more than enough for broad comparison purposes. What other large inscription of grand scale can match this vast array of letters and the craft supremacy of the inscription as a whole?

In his review (page 87) Hochuli mentions that “In a generously conceived and typographically polished publication, *Römische kapitals in Avenches*, only one of the twelve inscriptions illustrated which include the letters A, M, or N contain examples of pointed apexes.” (In footnote 9 we learn that the work was “Prepared and edited by teachers at the Zürück Kunstgewerbeschule and by students attending day classes in lettering and printing.” Since Hochuli is the lettering instructor at the school, this work is hardly admissible as impartial evidence.) He also states that Käch was “a better observer” than Catich because he pointed out that A, M, and N have flat apexes more often than pointed ones, whereas Catich “leaves the reader in the erroneous belief that these [flat], and not the pointed ones, are the exception.” This is getting a bit picky; Catich nowhere gives me this erroneous belief. Quality not quantity is the yardstick for assessing *script. mon.* Hochuli thinks it is quantity, for he cites in rebuttal the scarcity of Trajan-like majuscules as against the many examples of other kinds of inscription letters, especially those flat apexed A, M, and N. Who would assert that classic production should be more numerous than plebeian or that society is a delimiting factor when searching for a paragon model? Should Bach sound exactly like the majority of baroque composers? Should Arrighi's italic look exactly like all the other renaissance writers?

Correspondence

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

To the Editor:

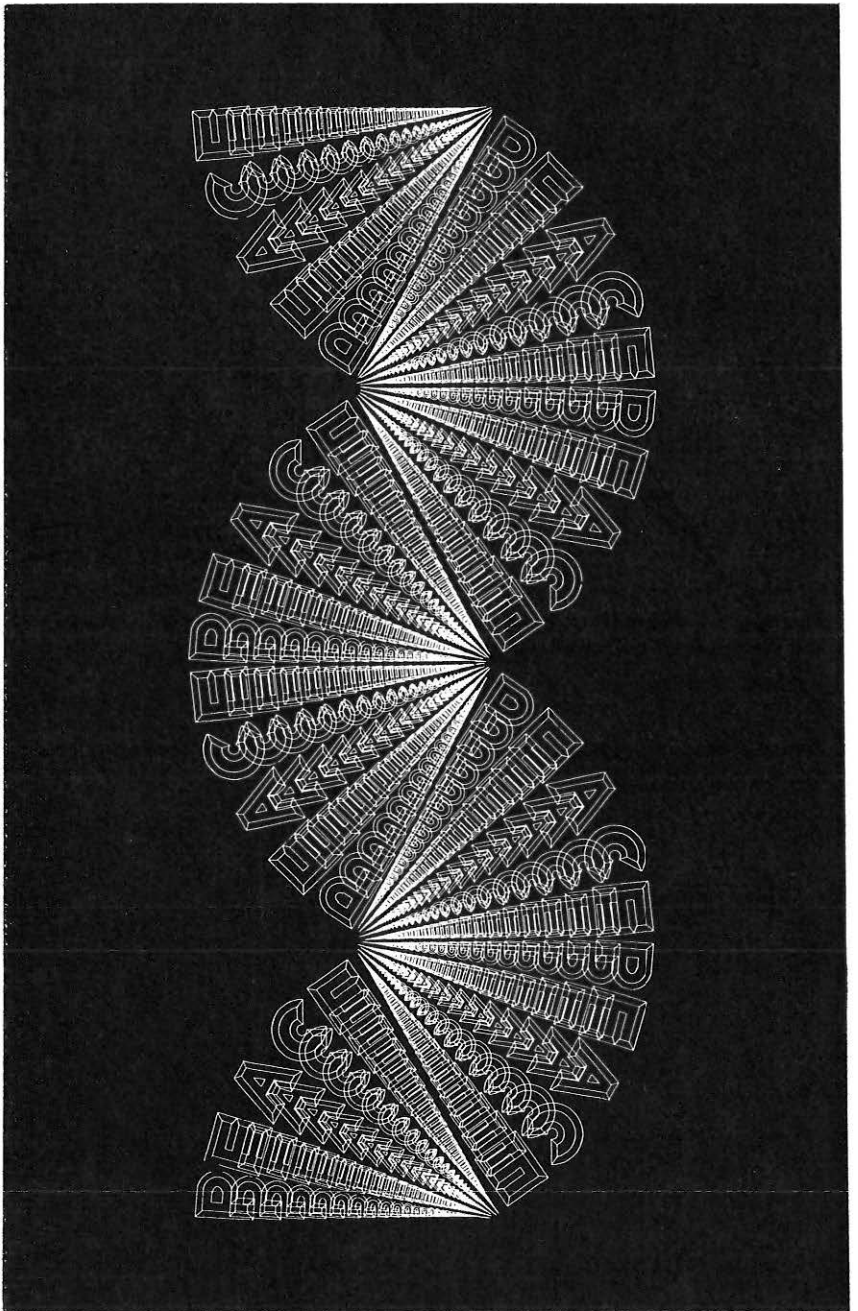
Jost Hochuli's review of *Origin of the Serif* by E. M. Catich (Winter 1973) was of special interest to me as I am familiar with the book and its importance in the field of paleography. The review is very generous in its lengthy analysis of this important work, but it is regrettable that the reviewer turns, in the latter part of the article, to a criticism which sounds more like prejudice than objective appraisal. The reviewer seems very intent in recovering any loss of prestige that his teacher Walter Käch might have suffered in Catich's book. I would have preferred that he confined himself to evaluating *Origin of the Serif* for its own merits. It is by far the clearest and most convincing study of our roman alphabet yet published. Allow me to comment on some of the parts of this review which I find disturbing.

Both Käch and Hochuli object to the Trajan inscription as the prime model for *scriptura monumentalis*. Käch goes so far as to say that "the roman capitals on the base of Trajan's Column show illogical, technical tendencies and therefore are considerably less beautiful in appearance than some forms of earlier roman capitals."

Looking at the Trajan inscription objectively and assessing it in the context of its time, a few observations are in order:

A. Emperor Trajan selected the gifted Greek architect Appolodorus to design and supervise the construction of the Trajan Forum. It is unreasonable to suppose that Appolodorus, who commissioned the best graphic artists and sculptors (as the cochlideal frieze on the Column demonstrates, and coins corroborate the existence of lost and destroyed features of the Forum), did not also have the services of the best sign-writer/letter-cutting artist in the Empire to compose and cut the inscription eulogizing the Emperor.

B. The inscription honoring the victorious Emperor-general is over the doorway leading to the burial chamber where the golden urn containing the Emperor's ashes reposed. As such, the inscription was planned as the focal point of the entire Forum.



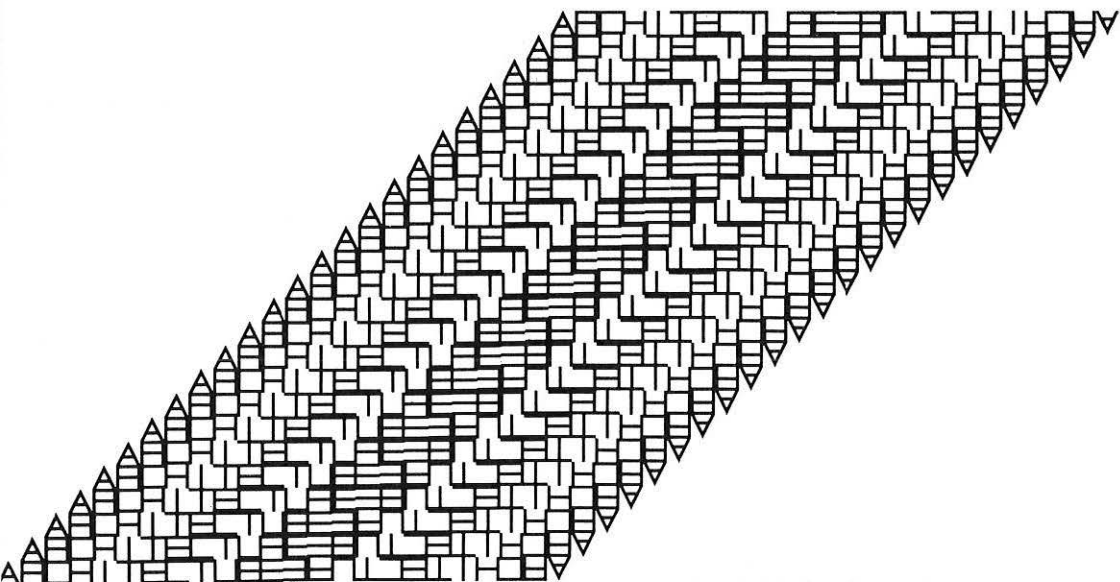
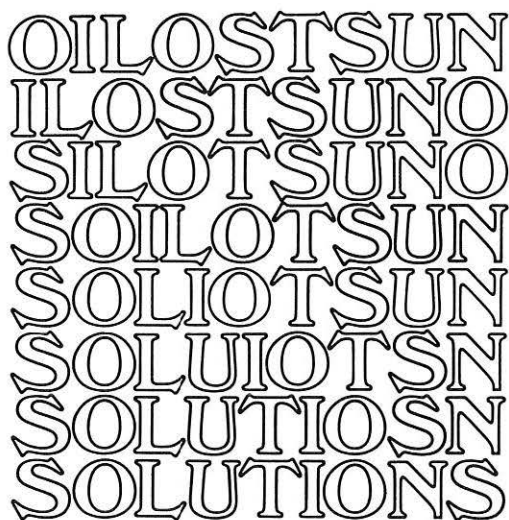


Figure 3. *Architecture Series*, 1969. Forms which express something of the insensitivity and monumental quality of so much modern architecture.

Figure 4. *Solutions*, 1972. Symbol for a design team-word/form developed for a specific use.



OVERLEAF
 Figure 5.
Computer Series,
 1970. An experiment
 for designers
 to work
 with programmers
 and the computer.

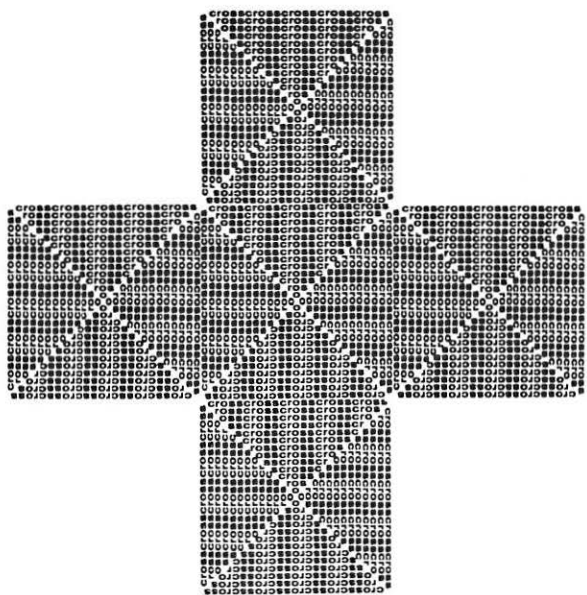
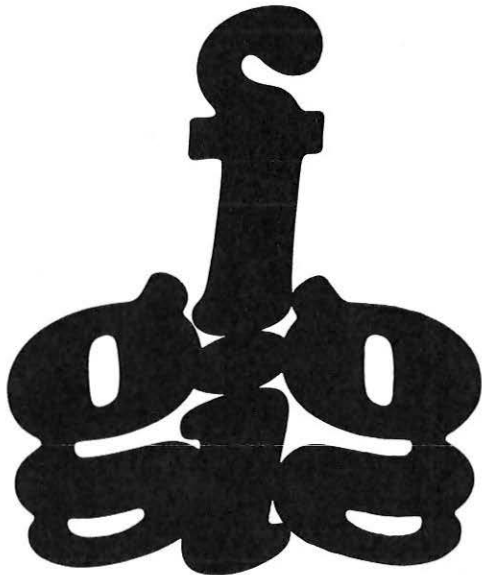


Figure 1. *Cross*, 1969. First word/form experiment.

Figure 2. *Fig*, 1969. Fruit series.



Design in Brief: Word/Forms

Gay Beste Reineck

Because we are continually surrounded by words, sounds, and images, our perception often becomes dulled and linear. Perhaps our perceptual capabilities need and enjoy the surprise stimulation of an unexpected visual statement. Words, as symbols, possess the power to evoke the meanings that they signify; when treated as visual statements their form goes beyond language, creating a deeper feeling of the word.

As a graphic designer working in the field of visual communication, I am confronted with problems that cover a wide variety of subjects, content matter, and message. Part of this content or message nearly always contains words—sometimes a single word, sometimes a group of words. My interest is in exploring the meaning and interpretation of a word or group of words; then, from this exploration, in developing a strong visual statement that clothes the word/words, transmitting directly their content. For example, repetition reinforces the effectiveness of a word or message; this is demonstrated on the opposite page and in most of the word/forms shown here.

This exploration, which is a synthesis of words into visual forms, is an approach towards a more visual interpretation of language.

Editor's Note on Experimental Design

One of this journal's primary aims is to encourage an exchange of creative ideas among designers. We invite both practicing designers and art/design school faculty members to submit presentations on experimental design work which involves letterforms, symbol systems, etc. Creative, unusual presentation of ideas is strongly encouraged; any medium may be used that can be reproduced in one color.

NOTE: Designers should submit to the editor a preliminary sketch and/or draft of their ideas before undertaking final rendering.

85 *Reineck : Word/Forms*

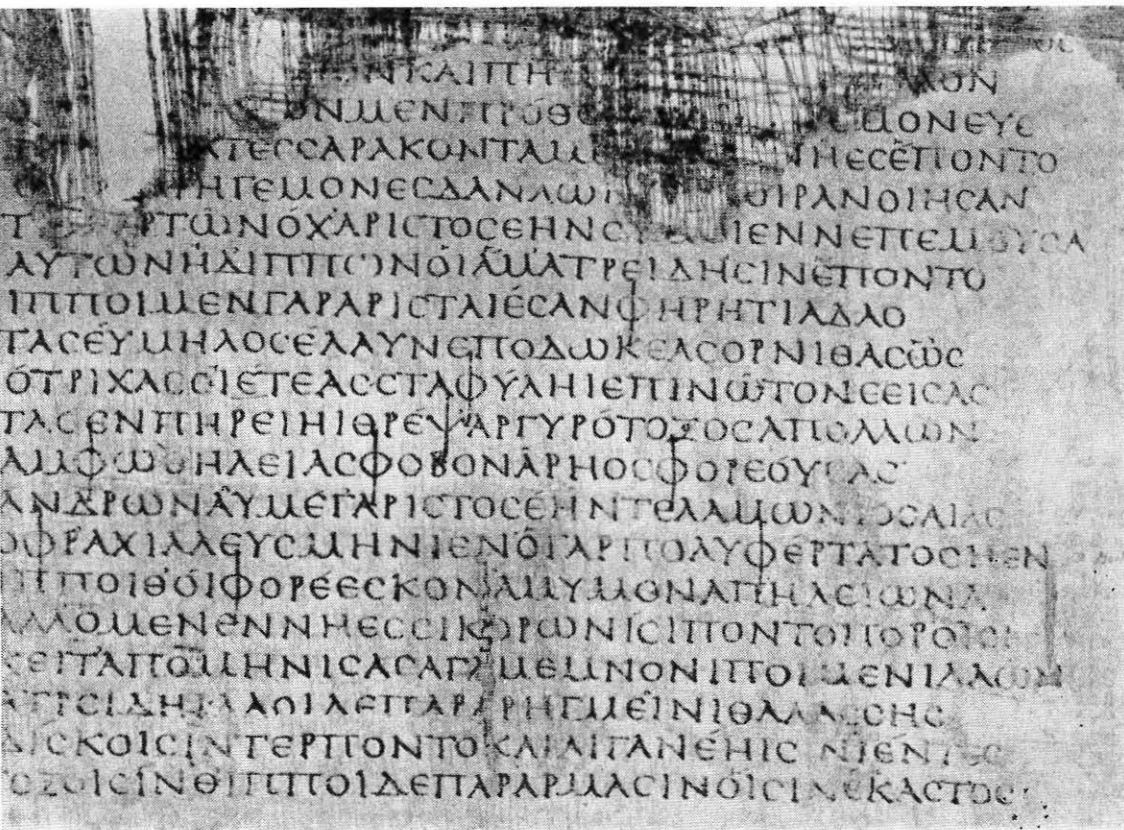


Figure 14. Homer, *Iliad* ii. Bodl. MS. Gr. Class. a. I(P). Haware, ii A.D. [13]. Detail.

thick, the obliques fine; the angle in this case may be estimated at 75 degrees. But Figure 13 has now been put back to a date which is the same as the date generally accepted for Figure 14. It seems therefore that both angles at which the pen was held were in use at the same time, and that far-reaching conclusions based on a change in the angle should be treated with reserve.

Excerpted with kind permission from E. G. Turner, *Greek Manuscripts of the Ancient World*. Oxford: Oxford University Press, and Princeton: Princeton University Press, 1971. © 1971 Oxford University Press.

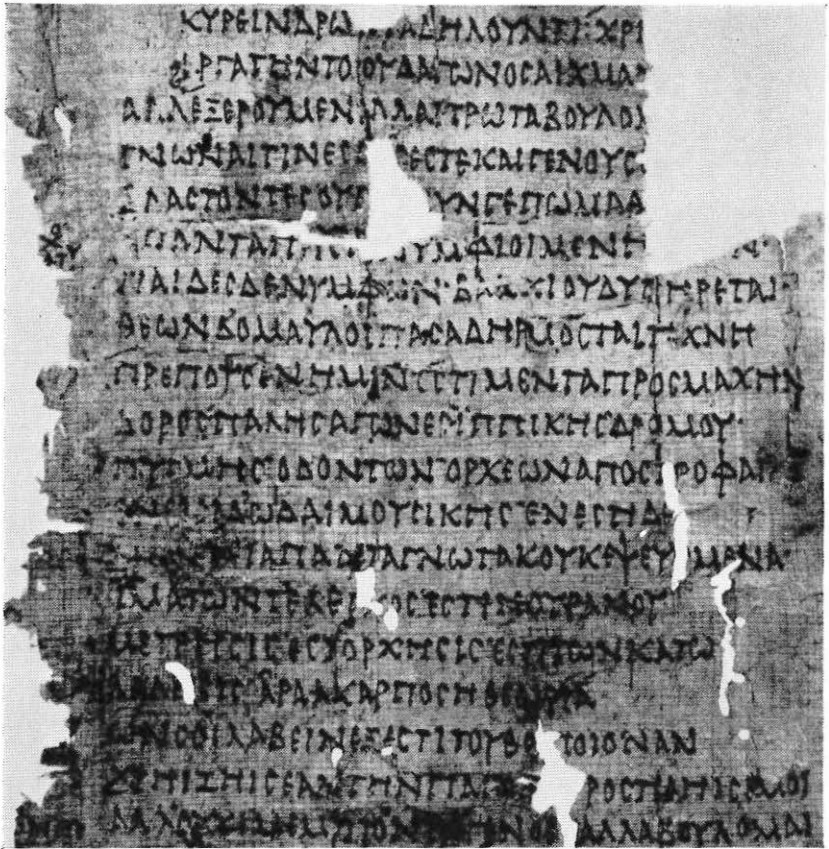
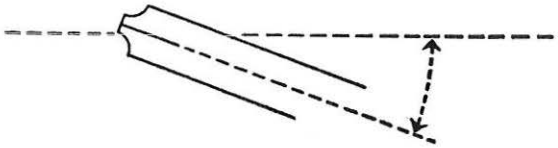


Figure 13. Sophocles (?), various plays. Cambr. Univ. Libr. MS. Add. 5895. Oxyrhynchus, ii A.D. [28]. Detail.

thick; this could have resulted if the pen had been held at an angle of 15 degrees (the angle is that formed below the line between the tilt of the pen and the horizontal).⁹ In Figure 14 the vertical strokes are

9. I use J. Mallon's figure for clarification.



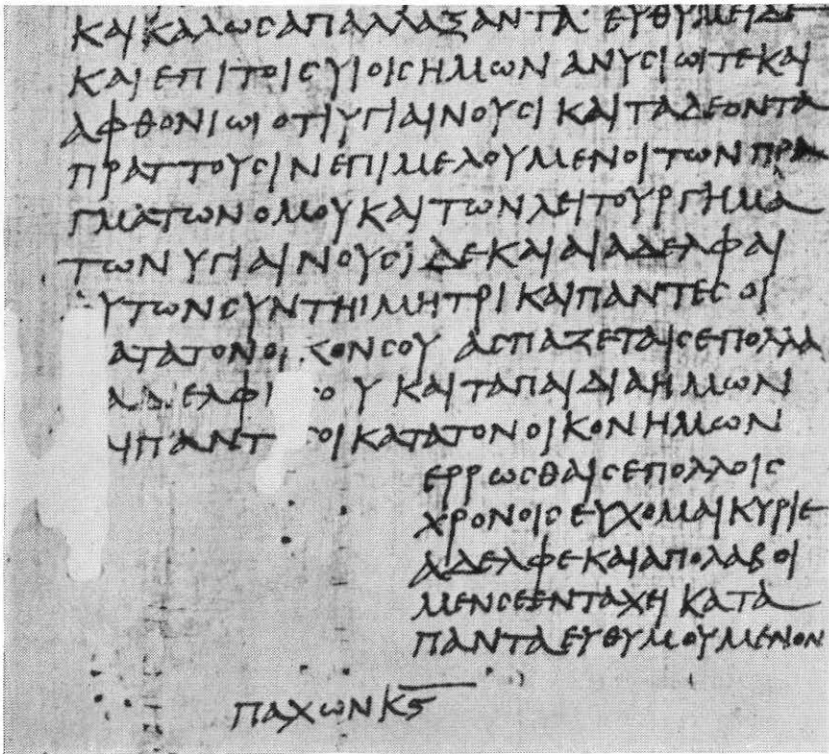


Figure 12. Letter from Hermodorus to Theophanes. John Rylands Library papyrus. Provenance believed Hermopolis. c. A.D. 325. [70]. Detail.

It is to this style that Figure 13 should be attached. In my view the contrast of broad and narrow letters found in this text had greater importance for an appreciation of its stylistic affinities than the presence of serifs and decorative roundels. On the arguments set out in the preceding paragraph, and if it was written in Egypt, its date is likely to be the middle of ii A.D. This date was vigorously maintained by A. S. Hunt against Schubart's dating in i A.D. If the ii A.D. date is accepted, there is a further important consequence. It has been argued by R. Marichal that between the date of Figure 13 and Figure 14 there was a change in the angle at which scribes held the pen.⁸ In Figure 13 the vertical strokes are fine and the oblique strokes

8. R. Marichal, "L'écriture latine et l'écriture grecque," *L'Antiquité classique* 19 (1950), pp. 125 ff. and esp. pp. 130-1.

What anchors are there in time for this class of hands? Figure 12 proves that its features are still clearly marked in the fourth century after Christ; Figure 11 carries them down probably to the fifth century. When did it take its rise? It is now common fashion to date the most distinguished example of this class, the British Museum papyrus of Bacchylides (Pl Lond. 733), to i A.D. H. J. M. Milne and J. Irigoin concur in this dating, and B. Snell records a consensus of opinion in favour of about A.D. 100. But an earlier generation of scholars tended to put it later: Medea Norsa, Grenfell and Hunt, W. Schubart (late ii A.D.), H. I. Bell.⁶ The later date seems to me to be more probable for the following reasons: (1) negatively, there are no objectively datable examples of this mixed style which belong to i A.D.; (2) positively, there are examples of this style which are objectively datable to either ii (especially P. Oxy. i 26, C. H. Roberts, *Greek Literary Hands*, 19a) or iii A.D. (op. cit., 19b, c, 20a, 21a); (3) there are cursive additions in the lines of the text of the Bacchylides which are not earlier than ii A.D. (especially $\alpha\theta\upsilon$ of $\delta\iota\zeta\eta\varsigma\theta\alpha\upsilon$, col. ix (38) 8); (4) in dated documents the contrast of broad and narrow letters is not found before the age of Hadrian.⁷ From the middle of ii A.D. onwards this contrast is developed into a prominent feature of the official chancery hand. I therefore assign the Bacchylides papyrus to a date not earlier than the second third or the middle of ii A.D. I note that its archaic features (the Ptolemaic appearance which impressed Kenyon, the contrast of narrow and broad letters which is to be seen in hands of iii B.C., the Ptolemaic ζ and ξ) could well arise from a deliberate return to archaic models, a return which would have been in sympathy with the literary taste of the age of Hadrian and the Antonines.

6. H. J. M. Milne, P. Lit. Lond. 46; J. Irigoin, *L'onziale grecque de type copte*, p. 47; B. Snell, *Bacchylidis Carmina*, p. *10; M. Norsa, *Scrittura greca letteraria*, p. 21; Grenfell and Hunt, P. Oxy. i, p. 53 n. W. Schubart, *Gr. Pal.*, p. 126; H. I. Bell, letter of 20/8/1946: "You have touched a sore spot *in re* Bacchylides. Milne's dating is a most unfortunate compromise, for which we are jointly responsible. As you know Kenyon dated it 1st cent. B.C., Hunt and Grenfell 2nd cent. A.D. We differed between the two and eventually struck a mean and called it 1st A.D. I am now certain, and Milne concurs, that this was a blunder; it may, improbably, be 1st B.C., it may very likely be 2nd A.D., but whatever else it is, it is *not* 1st A.D. So please disregard that dating."

7. Such as *BGU* i 73 (Schubart, *Gr. Pal. Abb.* 35) of A.D. 135; P. Bremen 5 (A.D. 120-30); P. Oxy. iv 714 = P. Lond. 1538 (not anywhere reproduced) of A.D. 122.

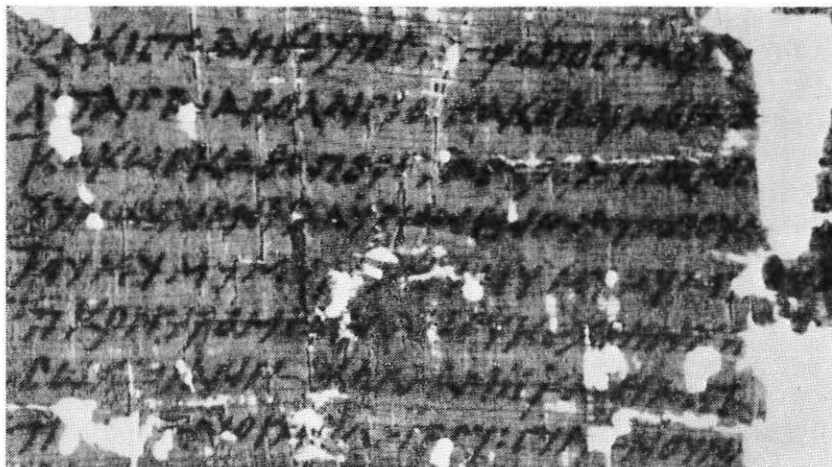


Figure 11. Aristophanes, *Equites* 6–15. Princeton A.M. 9056. Oxyrhynchus, v A.D. [42]. Detail.

The third type is that commonly known as “Coptic Uncial,” the hand of Figure 10, formed of chains of formal rounded letters of large size. As is set out in the introduction to that text, both the antecedents of this style and the date when it took its rise are quite uncertain. It may well have been between the second and fourth centuries after Christ. A formal style it undoubtedly is, and its loops are well rounded. But in so far as it may contain a contrast of broad and narrow letters (in Figure 10 $\epsilon \theta \omicron \varsigma$ are narrow letters), it shows the influence of hands falling in the next principal classification.

For the third main classification I use the term “Formal mixed.” The mixture found in hands of this class is double: first there is a mixture of narrow letters ($\epsilon \theta \omicron \varsigma$) and broad letters ($\alpha \delta \eta \kappa (\lambda) \mu \nu \pi (\tau)$); secondly there is a mixture of angular forms (the broad letters) and the curved ones. If the hand is upright, the angles will be right angles and the curves will be rounded (Fig. 13). If the hand slopes, the angularity of the broad letters will be emphasized, as in Figure 11, and the curves may easily become ellipses (P. Oxy. 2454), so that the term “sloping oval style” has sometimes been used. But the letters may sometimes be sloping and yet the curves remain round, as in Figure 12. The hands I classify as “formal mixed” would have been included by Schubart under the rubric “Strenge Stil,” the “severe” style.

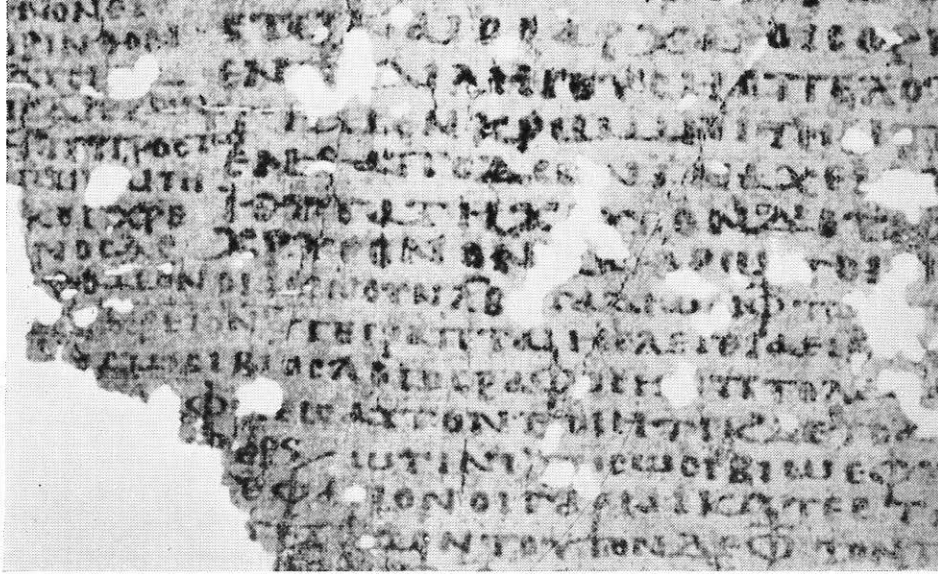


Figure 10. Callimachus, *Hymns, Aitia, Miscellanea*. E.E.S. Oxyrhynchus, vi or vii A.D. ? [47]. Detail.

ology of G. Cavallo.⁵ This, too, used large letters of set form (always *M* and ω); in contrast to the previous type, *v* regularly and ρ often reach below the line. Of course this hand is not confined to the writing of Bibles; the word “Biblical” is a relic of the terminology “Biblical Uncial” coined by Grenfell and Hunt, and applied by them to that writing found in papyri from Egypt which resembled the handwriting of the great Biblical codices, the Vaticanus and Sinaiticus and Alexandrinus. Of all styles of ancient handwriting this one attained the greatest flexibility of form. Cavallo terms it “a canon.” He traces its origin in early iii A.D. and its perfection in early iv A.D., and then ventures to assign dates to later examples according to their degree of deterioration from perfection. If I cannot accept this metaphysical concept, it is from a wish to have an empirical anchor in time and place for examples of this handwriting; and a belief that unless this hand can be proved to have emanated from a single centre, it too is unlikely to have developed and degenerated in linear fashion. If it was written in several centres it is likely that cross-influences will have affected this style, as they did other styles.

5. There are important discussions by P. J. Parsons, *Gnomon*, 42 (1970): 375–380; J. Irigoin, *Scriptorium*, 24 (1970), 67–74; N. G. Wilson, *Journal of Egyptian Archaeology*, 57 (1971), 238–240; P. Canart, *Byzantium*, 40 (1970), 218–225.

“Zierstil,” the *decorated style*. Of course there are handwritings in which such serifs and roundels are prominent features. But it is necessary to attend to the frequency with which the decorations occur (is there any stroke without them?) and the angle made by the arch or the serif with the vertical (is the serif horizontal or oblique? does it face left or right?) It might eventually turn out that writings in which every vertical stroke was finished with an obliquely angled serif could be restricted in time or place. Schubart himself was unwilling to give a currency of “more than a century, from the last century of the Ptolemaic era to about A.D. 100” (*Gr. Pal.*, p. 112) to his concept of the style. His successors have tended to extend the time limit: Figure 3, for instance, has been claimed for it (and Figure 3 is of A.D. 200–250 in my view). In ii B.C. there are hands in which serifs are prominent (Fig. 6); they are there in i B.C. (Fig. 8); and some serifs may be seen as early as Figure 9; i.e., in late iv B.C. The presence of serifs and decorative roundels without further discriminant is, therefore, in my opinion inadequate to characterize a style; the objection might be alternatively expressed by pointing out that the time-span of a style so characterized would be so great that non-shared features among its members might be more important than their shared features. The point will recur a little later in the assessment of Figure 13.

The first type I shall distinguish under the rubric “Formal round” is the hand represented by Figure 14, in which each letter (ι only excepted) occupies the space of a square ($\epsilon \theta \omicron \varsigma$ being broad circles) and only ϕ and ψ reach above and below the two lines. I regard Figure 8 as an example of this style belonging to the middle of i B.C.

The second type is the “Biblical Majuscule,” to adopt the termin-

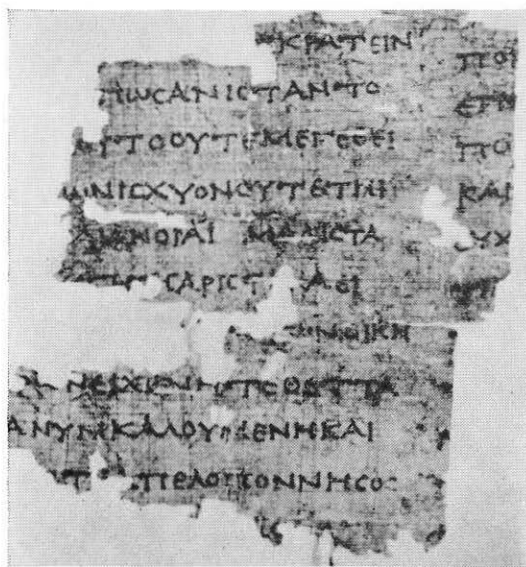


Figure 9. Thucydides
I. 2. P. Hamb. 646.
Provenance unknown,
papyrus cartonnage, c.
250 B.C. [54]. Detail.



Figure 7. Demosthenes, *De Falsa Legatione*, 53–7. Cairo Mus. Inv. 47446. Oxyrhynchus, i/ii A.D. [67]. Detail.

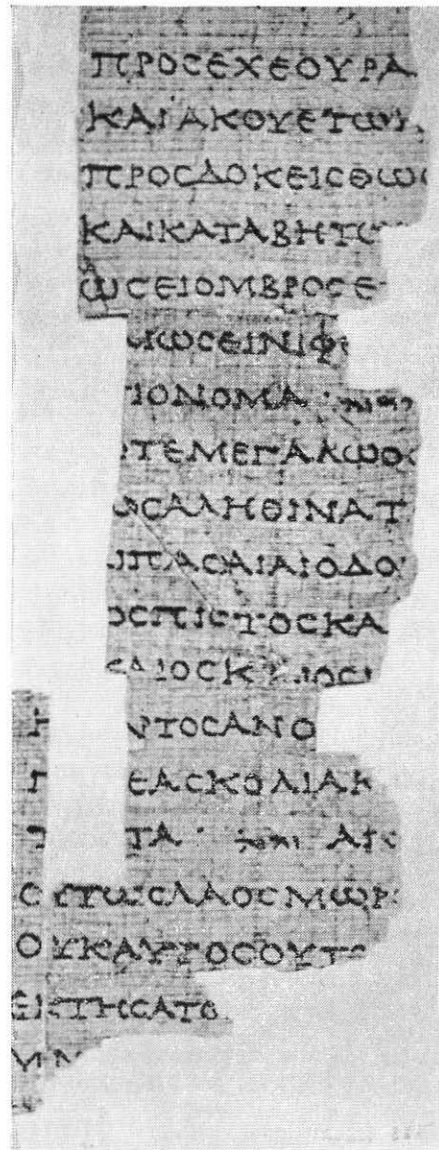


Figure 8. Septuagint, *Deuteronomy*. Cairo, Soc. égypt. de papyrologie, P. Fouad Inv. 266. Provenance unknown, middle i B.C. [56]. Detail.

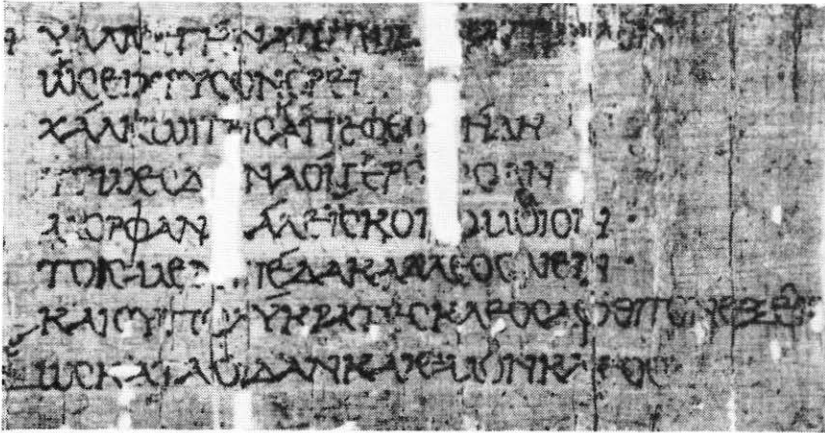


Figure 6. Ibycus. E.E.S. Oxyrhynchus, ii B.C. [20]. Detail.

with more character, is Figure 2 which has several points of contact with the upright capitals in which documents were written at Oxyrhynchus in the later part of i A.D. or earlier part of ii A.D. A much better-formed type is represented by Figure 6, a type which begins in the Ptolemaic period and runs into the first century after Christ. This type is markedly upright, and it is only by application of the strictest standard (e.g. comparison with Figure 8) that it deserves the adjective "informal." Figure 7 perhaps continues this mode of writing; it is later in date, and certainly merits the term "informal." Figure 3 should in my opinion be included in the "informal" class, though the literary hand is professional work. Figure 1, a beautiful and well-formed round hand, is very close to the borderline between "informal" and "formal." Again, it is only by applying strict standards (comparison with Figure 14) that it is still included in my first class.

The classification "Formal round" is attained by far fewer hands. They are almost instantly recognizable, if only from the generous size of their letters. The three different types into which I shall subdivide them can be regarded with some confidence as embodying real "styles," not resulting from accidents of classification. One subtype to which I am reluctant to give recognition is that formal rounded writing in which the letters having vertical strokes are finished with serifs or decorative roundels: what Schubart calls the

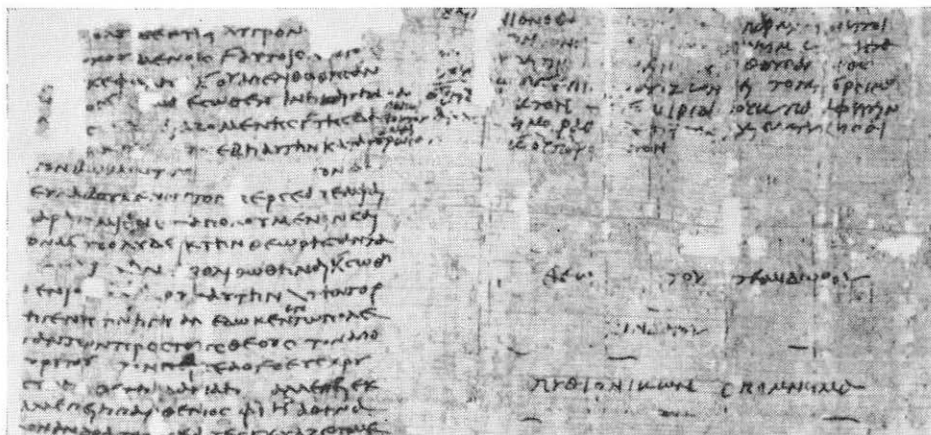


Figure 5. Hypomnema of Theon on Pindar, *Pythians*. E.E.S. Oxyrhynchus, ii A.D. [61]. Detail.

of a single linear development in forms of handwriting can be saved only by the drastic postulate of many different sources for our material.

The objective considerations I have taken into account for my classification include (a) the degree of formality aimed at by the scribe (formal or informal hands); (b) the speed of execution (“fast” or “slow” writing); (c) the size of the writing (large, medium-sized, small, tiny); (d) the typology of the letters (are they predominantly rounded, and if so, rounded definable by a square, rectangular, or oval?); (e) the inclination of the writing (upright, leaning backward to the left, leaning forward to the right); (f) the distance between the written lines, or between the notional parallels which bound the letters, and the extent to which bilinearity is retained.

I shall classify literary hands of the first four centuries A.D. into three main groups: (1) Informal round hands; (2) Formal round hands; (3) Formal mixed hands. Inside each group I shall endeavour to call attention to a number of types.

The class of Informal round hands is large and most open to the reproach that it results from mechanical procedures of arrangement. It includes hands so quickly written as to be almost characterless—“nondescript” is the adjective applied in the description of Figure 5, a hand which is rounded but also seems flattened. Still Informal, but

scribe are, of course, the most important means by which stylization is achieved. A manner of writing is frequently definable by the conformation given to groups of related letters, notably $\epsilon \theta \sigma$ (an easily memorable group in view of the Greek meaning "habit") and by the treatment of the "tall" letters ϕ, ψ , and perhaps ι, ρ, ν . Attention to such groupings will often give more reliable results than emphasis on idiosyncratic shapes (ζ, ξ, α, μ), valuable as the latter may be in the identification of individual scribes. To apprehend the "style" through the letter-forms is the first necessity. Once a handwriting is placed in an ordered system of "styles," closer analysis of the significance of particular letter-forms may be possible by comparison with texts, the dates of which are known, whether they are literary or documentary.

I am aware that if this method is to be followed "styles" must be distinguished, and that it is an undertaking of some boldness to erect even a skeleton framework of "styles" and hope to make it acceptable and useful for others. There are two separate dangers. One is the risk of elevating into "styles" having a life of their own what are no more than serviceable classificatory concepts. The term "style of handwriting" suggests an external reality, or at least an ideal present in the minds of the scribes who wrote it. I cannot hope to do better than offer "classifications." Secondly there is the risk of deceiving oneself about the characteristics of a "style." Subjective illusion can be guarded against by basing classification on considerations which can be apprehended objectively. The whole classificatory process may then be thought too mechanical. The dilemma is a real one. It arises because palaeography is neither a science nor an art, but works through a continual interaction of the methods appropriate to both approaches. And in the last resort a judgement has to be made—and judgement is fallible.

My classification will only apply to writing between i and iv A.D. For the Ptolemaic period insufficient material is available to allow such an attempt. But both for it and for the Roman period my conclusion (which is given here in anticipation) is that several "styles" of writing were simultaneously in use. Contemporary with each other, they cross-fertilize and hybridize easily. Study of these reciprocal influences is rewarding, provided only that the investigator is not trying to prove a derivation of one "style" from another. The theory