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WRITING

Albertine Gaur



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Preface

Most works dealing with the history of writing look upon writing mainly as a means of reproducing language with the aid of graphic symbols. This attitude automatically imposes a hierarchical structure. If the aim of writing is the reproduction of language then the most satisfactory, and by implication the most advanced, form of writing, is the one which reproduces language most accurately, in the most economical manner — which inevitably leads to the alphabet. In the same way, if writing is based on the use of graphic symbols then the material most suited to receive and preserve such symbols is the material most suited for writing — which in turns leads to paper. Taking this attitude to its logical conclusion, writing can then be divided into three main groups: ‘proper’ writing, where a small number of codified graphic symbols reproduce, most accurately, the sounds of a particular language; ‘forerunners of writing’, where the sound element is still absent and symbols (or perhaps objects) reproduce whole ideas; and ‘transitional’ forms of writing where sound elements start to emerge. The alphabet thus becomes a Platonic idea towards which all forms of (proper) writing must by necessity progress.

Until very recently such an attitude was indeed perfectly justifiable, perhaps even self-evident. But during the last thirty years, especially during the last decade, the situation has changed dramatically. As we advance further and further into the new age of information technology, the storage, preservation and, ultimately, the dissemination of knowledge, depends no longer on the actual process of writing. Computers store information in an electronic memory by means of positive and negative impulses — the way information was once (during the age of oral tradition) stored in the human brain. With everything around us changing it is perhaps time to re-examine the concept of writing and look at it, not from the point of how effectively it can store language, but how effectively it can store information; information essential to the economic and political survival of a given society.

An extensive and in parts highly detailed literature exists on the various aspects of writing, the different scripts, their history and possible relationship to each other, and this study in no way pretends to compete with the work done by individual specialists in their respective fields. Its aim is of a more general nature; namely, to look upon writing from the late 20th-century concept of information storage, to examine the interactions between society and writing and to introduce the subject to a wider and more general audience. The story of writing is a tale of adventure which spans some twenty thousand years and touches all aspects of human life. It is important in universal, not just in scholarly, terms. Such an overall view of a highly complex subject must by necessity omit many details and invite speculations with which individual specialists may not always wish to agree. For those interested in a more detailed and perhaps more traditional approach there is a select bibliography at the end of this book (amended for the second edition) and there are abbreviated references in the text itself; the purpose of the latter is less to reinforce a particular opinion than to lead the reader to places where he or she can find more information of a factual and/or bibliographical nature.

While the opinions expressed in this study are of course my own responsibility, I am greatly indebted to colleagues inside and outside the British Library who have generously

allowed me to share their time and expertise. I would especially like to thank my colleagues Ken Gardner, Frances Wood, Beth MacKillop, Yu-Ying Brown, Muhammad Isa Waley, Yasin Safadi, V. Nersessian, Kathy van de Vate, Lama Chime, Patricia Herbert and David Goldstein, of the department of Oriental Collections (previously the Department of Oriental Manuscripts and Printed Books); Tom Pattie, of the Department of Western Manuscripts; Lotte Hellinga, of the History of the Book Group, and Annie Gilbert, of the Photographic Department of the British Library. Also Malcolm McLeod, Elisabeth Carmichael, Doroto Starzecka and John Mack, of the Museum of Mankind; Christopher Walker, of the Department of Western Asiatic Antiquities, British Museum, who generously provided the drawings on p.66, and Morris Bierbrier, of the Department of Egyptian Antiquities, British Museum, who supplied those on pp. 62–63. My thanks are also due to V. A. Tatton-Brown, of the Department of Greek and Roman Antiquities, British Museum; Robert Watson and Robert Skelton, of the Victoria and Albert Museum; Tovia Gelblum of the School of Oriental and African Studies and Hilary Henning, for lending her computer expertise.

I should like to thank the following for permission to reproduce photographs in the book: the Trustees of the British Museum; Bodleian Library, Oxford; Mr Michael O'Keefe; American Tourist Board; Victoria and Albert Museum; John Rylands University Library, Manchester; University Library, Heidelberg; Bavarian State Library, Munich. The drawings on pp. 47, 49, 75, 76, 105, 167, 168, 187 and 192 are by John Ronayne.

10 March 1987

Albertine Gaur

Preface to Revised Edition

I have taken the opportunity to make corrections and to update the bibliography. I have also added a completely new dictionary of scripts, which I believe to be more or less comprehensive for the most important scripts. My thanks to David Dawson for his painstaking care in the production of the artwork for this section of the book.

January 1992

Albertine Gaur



PLATE I Codex Nuttall (made of deerskin); describes the sacred history of the Mixtec people, mainly in relation to events connected with the life of a great military and political hero, 8-Deer Tiger Claw, who lived between 1063-1101 AD. The manuscript was probably completed shortly before the Spanish conquest of Mexico. (British Museum; Museum of Mankind; 39671)

PLATE II Traffic signs, notices and information; photographed by the author.





PLATE III Kalpasutra; from Gujarat; dated 1502/1445. The soothsayers and astrologers consult their scrolls to determine the meaning of Queen Trishala's fourteen dreams and write down their opinion. (British Library; Oriental Collections; Or. 13700. f. 61)

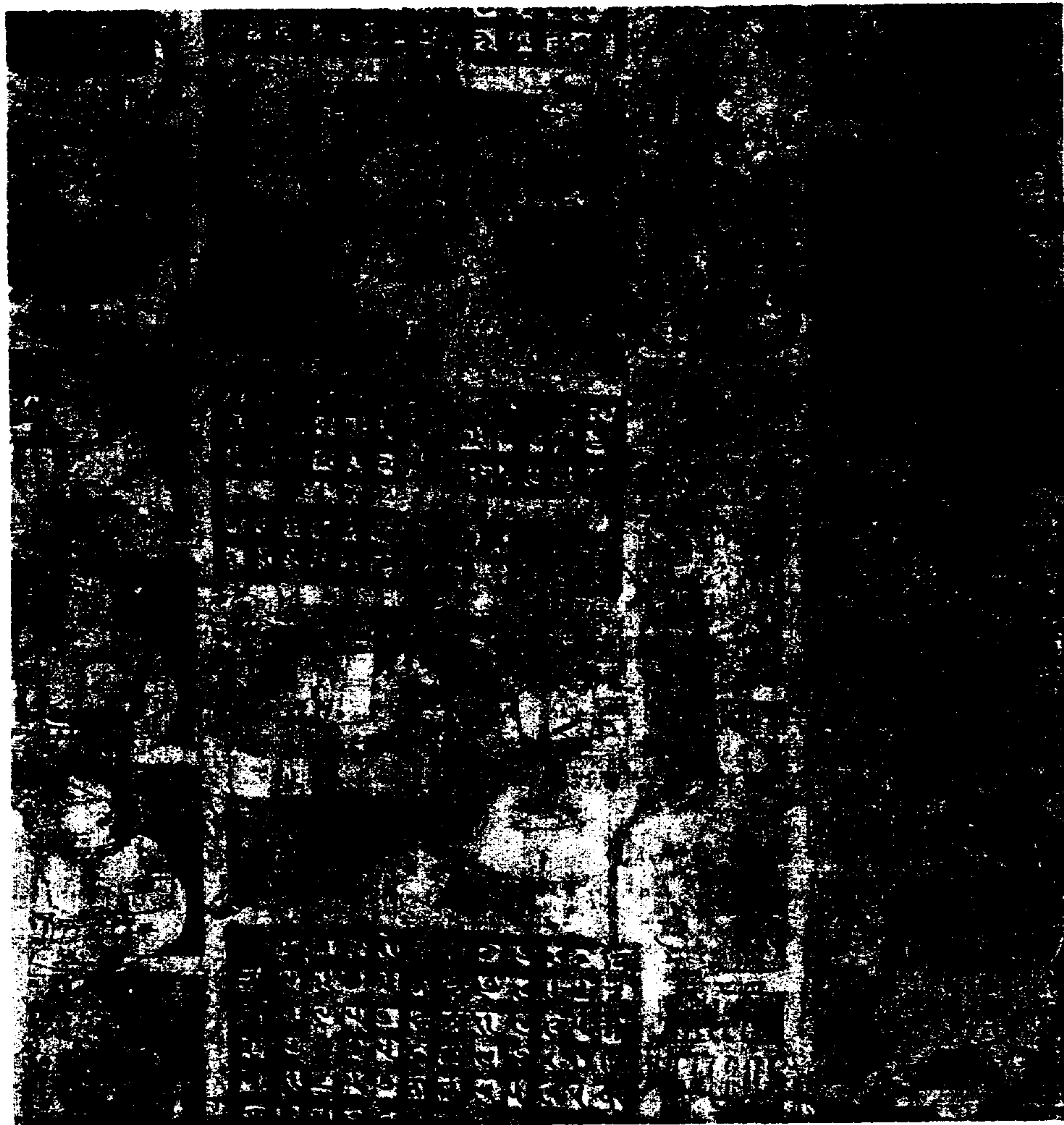


PLATE IV Almanac written on cloth; the beginning is illustrated with signs of the zodiac; in the Rajasthani folk-style; 1844/45 AD. (British Library; Oriental Collections; Or. 13489)

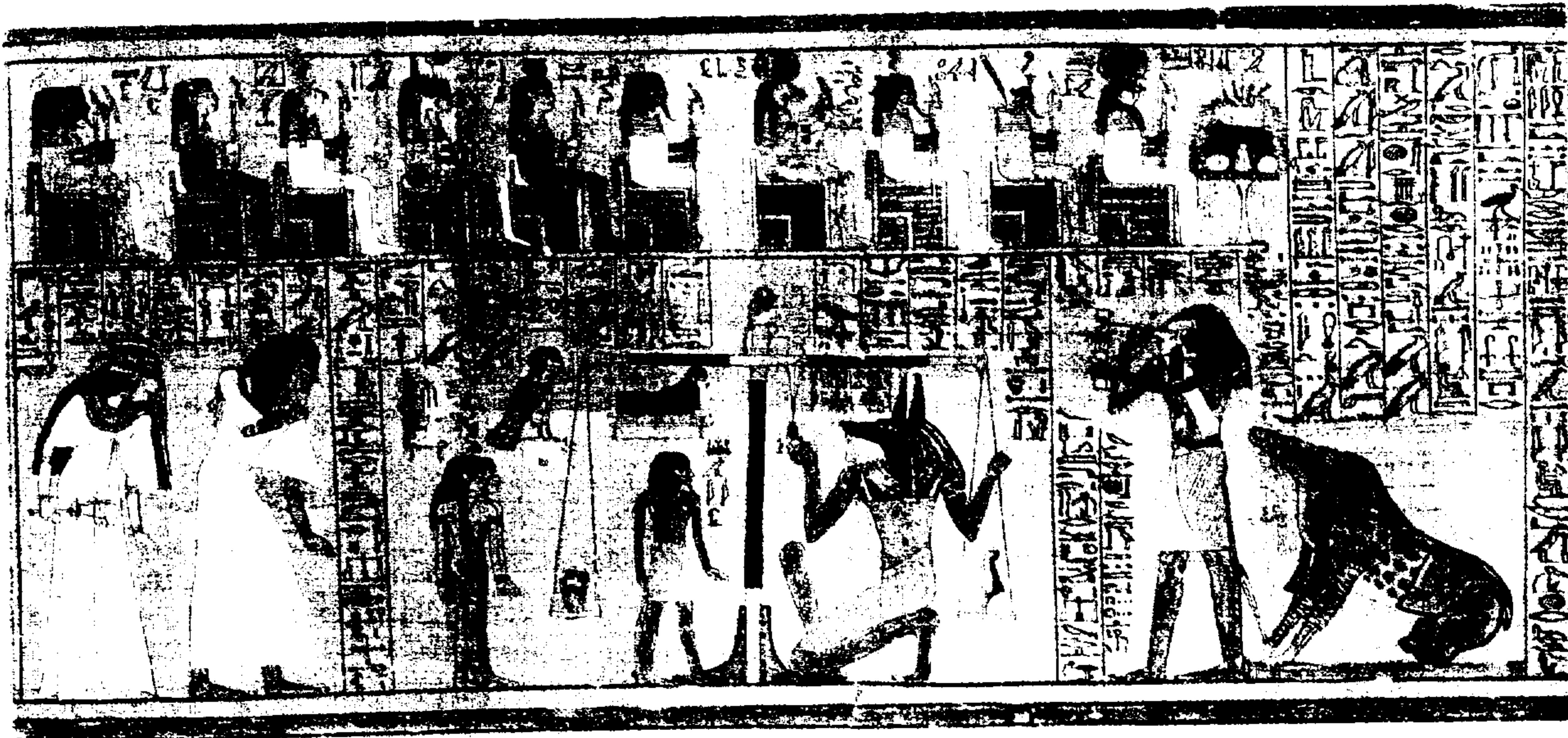


PLATE V Among the Egyptian pantheon, the ibis-headed Toth acts as scribe and patron of letters. He is here shown noting down the answers given by the deceased royal scribe Hunefer in the course of the latter's judgment in the realm of Osiris. From Thebes, 19th Dynasty, c. 1250 BC. (British Museum; Department of Egyptian Antiquities; 10470)

en on cloth;
ed with signs
asthani folk-
ish Library;
: 13489)

PLATE VI Page from the Lindisfarne Gospels; the main text (7th century) is written in insular majuscule (a script first developed in early Christian Ireland), with decorated initials, and the Anglo-Saxon gloss (added in the mid-10th century) written in insular minuscule. (British Library; Department of Manuscripts; Cotton MS. Nero. D. iv, f.15)

Quia uomen patri
 refueris Quisquis
 sine principio sine
 fine ostendens inuim
 semper patre esse qui
 inuis est in quo enuim
 celo tale descendit
 ab omni sic prima in
 mena uel perfectu
 cognoscere in uocau
 to a post ob corpus
 euangelii uellectione
 diuinitatis uelscitas
 per inuensa legentes
 intellegant aut quo
 appraehensum
 appraehensere
 exptant recognoscant
 nobis enim hoc tuuo
 argumentum fuit ex hoc
 facte retrahere
 cooperamus diuinitate
 ueniam diligenter esse
 dispositionem quatenus
 non uere explicat

GENERATIONUM
 quod dicitur dicitur
 ab abraham usque
 ad christum ordo narratur
 Hanc uisum ihesu dema
 ria sponso eius ioseph
 angelo uelclante
 praedictur
 Hanc uisum xpi magnificenti
 sibi omni uirtute
 oblatum multitudine
 ad honorem
 Angelo praedicatione
 ioseph cum xpo iura
 matrem uel herodes
 occidit inuirtutes
 de praedicatione iohan
 baptistae quod uir
 clamantis sit per mcham

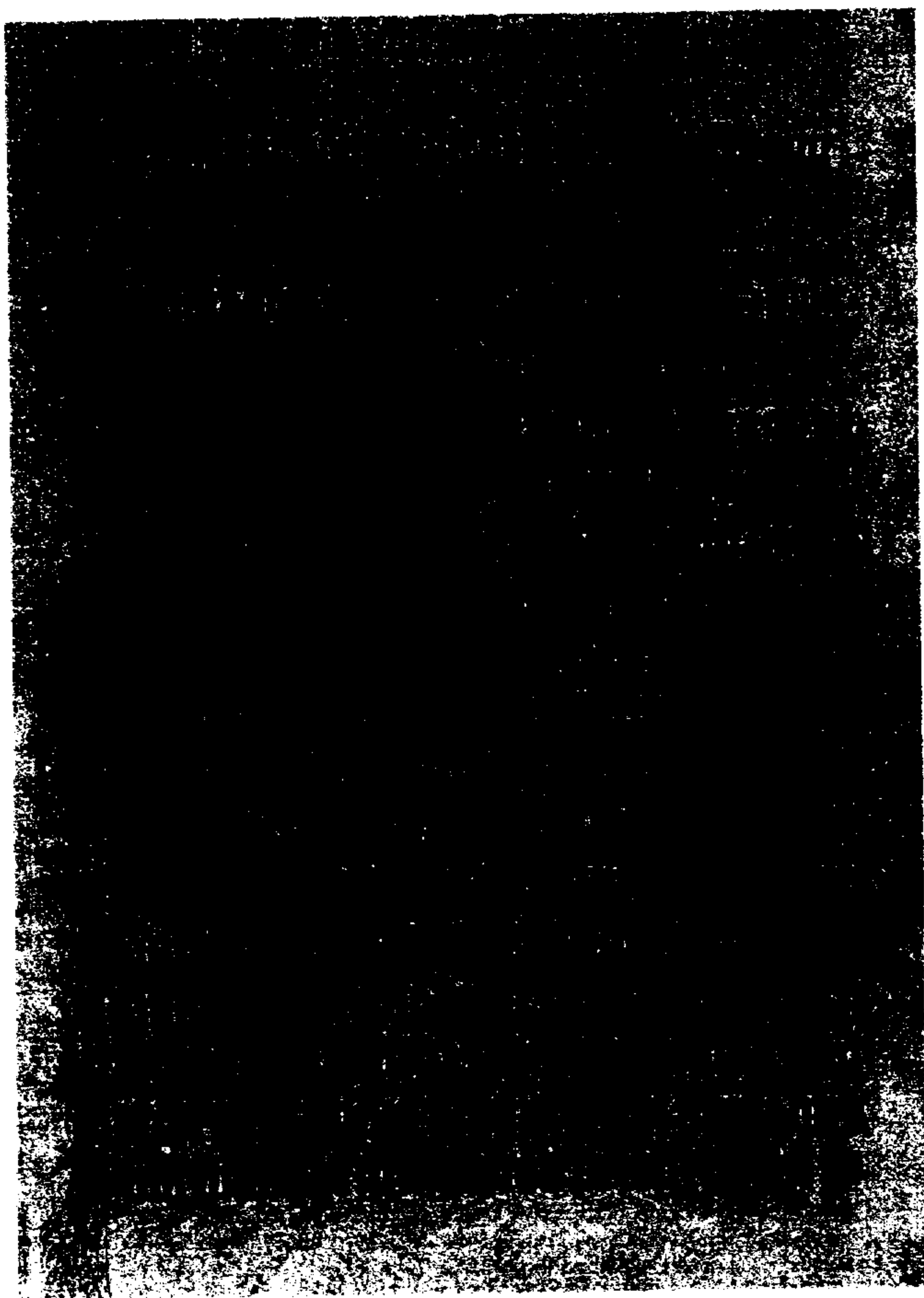
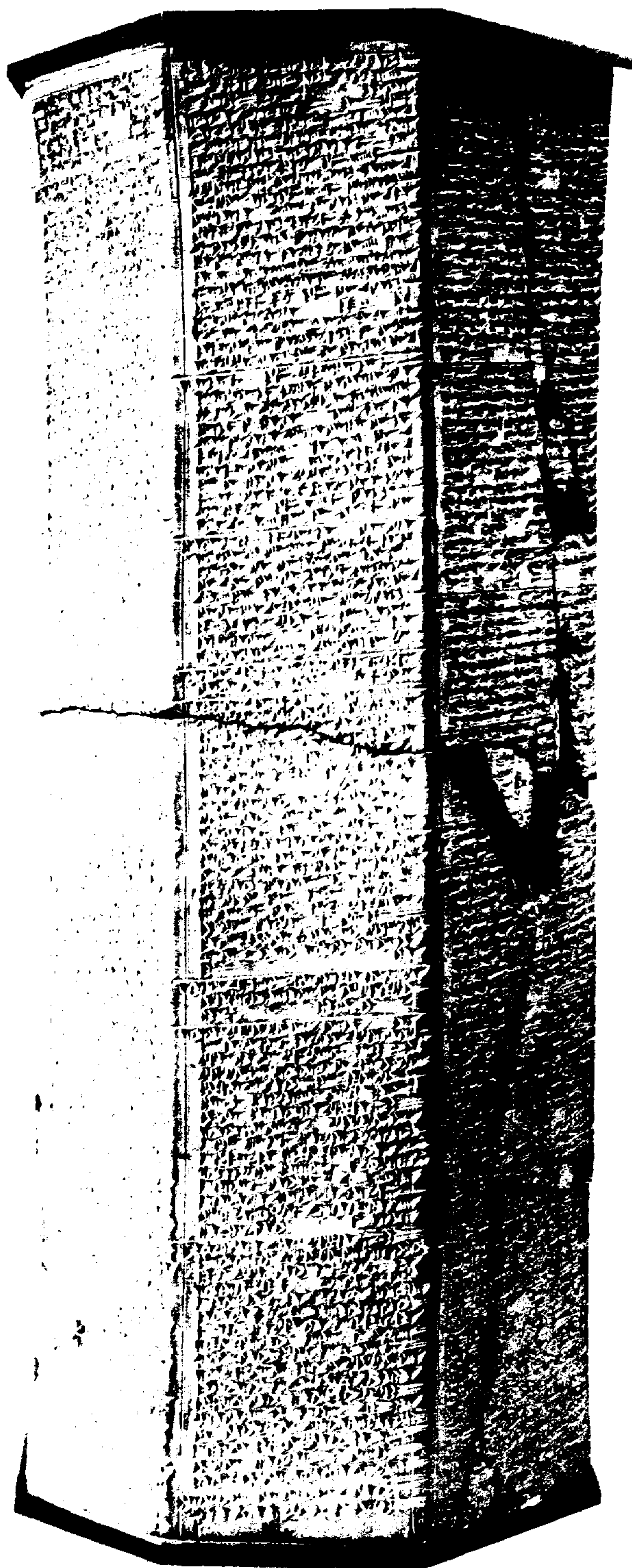


PLATE VII Biblia Pauperum; chiroxylographic book; c. 1420 AD. (University Library of Heidelberg; Cod. Pal. Germ, 438, f.117)

PLATE VIII Psalterium cum canticis, printed by J. Fust and P. Schöffer in Mainz, 1457. (British Library; Department of Printed Books; G. 12216, f.1r)

I Origin and development of writing



What is writing and who needs it?

All writing is information storage. It is not the only form of information storage. Long before, and in many instances simultaneously with it, human memory served the same purpose. In most cases it was the memory of a specially trained and select group to whom society entrusted this task. Basic differences exist between these two forms of information storage which relate mainly, though not exclusively, to the transmission and the dissemination of information. Oral transmission needs personal, often (depending on the nature and complexity of the information) prolonged, contact between two or more individuals who have to be physically present at the same time and in the same place. Enough time has to be spent to satisfy (though never fully) the one who transmits the information that the other has effectively stored it in his memory, that he will be able to retain and eventually transmit it correctly. In the case of writing, the information is stored mechanically, on an independent object, and can be retrieved and used at any time, in any place (in the case of moveable objects such as books etc.) by all those who are able to consult and decode it. Here too, memory plays an important part, but only in the form of a one-time effort — that of learning the rules, however rudimentary or complex, of a particular form of script. Afterwards all information stored in this way is available to those who have mastered the rules.

Writing has other advantages, too. There are limits to the amount of data that human memory can retain. There is, in theory at least, no limit to the amount of information that can be stored in written form. In addition, being free of the often onerous task of having to assimilate completely (and perhaps permanently) some particular information, this information, consulted in written form, can be used as a basis for new speculations. Thus one generation not only acquires the knowledge of previous generations but can use this knowledge to make new discoveries, and to formulate new conclusions, which can then be added to the ever-increasing corpus of available data. In other words, written information can be manipulated. Learning by heart has the disadvantage that it does not encourage critical thinking; and it has indeed always been preferred for poetry (religious and secular), history (legendary, epic, semi-factual) or for secret knowledge not meant to go beyond the limits of a particular group.

If all writing is information storage, then all writing is of equal value. Each society stores the information essential to its survival, the information which enables it to function effectively. There is in fact no essential difference between prehistoric rock paintings, memory aids (mnemonic devices), wintercounts, tallies, knotted cords, pictographic, syllabic and consonantal scripts, or the alphabet. There are no primitive scripts, no forerunners of writing, no transitional scripts as such (terms frequently used in books dealing with the history of writing), but only societies at a particular level of economic and social development using certain forms of information storage. If a form of information storage fulfils its purpose as far as a particular society is concerned then it is (for this particular society) 'proper' writing.

Basically, all forms of writing belong to either one or the other of two distinct groups — thought writing or sound writing. Thought writing transmits an idea directly; the drawing

of a leg means 'leg' or 'to go', the drawing of a tree means 'tree' (it could of course also mean 'fresh', 'green', 'life' etc.), the drawing of two trees can mean 'forest' and so forth, in any language. Sound writing (phonetic writing) is far more complex. It is not as we, on the basis of our own experience and training might be tempted to assume, more natural, nor even necessarily always more effective. In many ways it is a tortuous and somewhat unnatural process. An idea has to be translated first into the sounds of a particular word or sentence in a particular language, then those sounds have to be made visible in the form of engraved, painted or incised signs on the surface of a definite object, signs which more often than not bear no relation to the content of the original thought. In order to consult the information (and ultimately the whole purpose of information storage is communication) these visual signs have to be translated back into the sounds of the same language, and from this the word, the sentence and the original idea have to be reconstructed in the mind of the reader. And this is in fact exactly how primitive people without any writing of their own view the process.

Though the division between the two groups is absolute and basic, it would be wrong to assume that it is also clear-cut, that all forms of writing belong, wholly and exclusively, to either the one or the other group. As we shall see later, phonetic (sound) elements evolved early and often quite rapidly in almost all ancient forms of writing. Ideographic (thought) elements indicative of a concept or word are eventually left behind in most — though by no means all — scripts (see Chinese writing, for instance, but also signs such as 2, &, £, \$ etc.), and phonetic elements become dominant and finally exclusive in syllabic, consonantal and alphabetic scripts.

The word 'evolve' has been used on purpose. A good number of scholars have been, and still are, of the opinion that phonetic writing in the full sense is the result of a definite, unique invention which took place only once; others, with a somewhat less fundamentalistic turn of mind, see in phonetic writing the result of several sporadic and often (semi-) historically documented inventions made by a number of definite persons (see *Invented Scripts*, pp. 130–134). The latter opinion has been revived by recent observations of how a number of people belonging to still basically tribal communities in Africa, North America and Alaska (AS, pp. 15–219) made often temporarily successful attempts at inventing indigenous forms of writing. However in all those cases one can see, if one looks more closely, that the invention was in reality more a modification, stimulated by a close contact between the inventor(s) and an established system of writing, usually the Roman alphabet or the Arabic script. The history of writing is a long process of evolution — though, as in all historical and evolutionary processes, stimulated along the way by the contribution of especially-gifted individuals.

What kind of writing a society evolves, or chooses, depends largely if not wholly on the kind of society it is. (For once the chicken comes definitely before the egg.) The mere availability of writing does not transform a society. If writing is irrelevant to the existence and survival of a particular society, this society will, on coming into contact with writing, either completely reject it or accept it in only a limited form, perhaps just for the use of a small and then often (but not always) privileged section. If a society has reached a stage of development where systematic writing becomes important for trade and administration (literature as such has always been able to manage perfectly well without it) — as happened in ancient Egypt, Mesopotamia and the Aegean — it will either evolve a script on the basis of already existing non-oral forms of information storage (such as memory aids, property marks, pictorial representations, tallies), or, often depending on the political situation, accept, adapt or modify the writing of another (not necessarily dominant) group; even if this form of writing might prove highly unsuitable for the linguistic peculiarities of its own

language (Mesopotamia and Japan are two examples). But nowhere do we find a case where a society first developed a systematic form of writing and then increased its level of social and economic efficiency. Scripts do not create civilizations or new forms of society, but societies can create a new form of information storage.

Let us here briefly recount: what exactly are the advantages and disadvantages of the two main groups? We have already discussed the advantages of the first group — the thought or ideographic form of writing. They are, as we have seen, the possibility of communicating ideas and thoughts directly between the writer and the reader without the intermediary of language. In other words, this form of writing is independent of language; it can be understood and read in any language. An example, well-known and widely used, is the Chinese script, about which more will be said later. The disadvantages are the great number of different signs which have to be used (and remembered); in the case of Chinese as many as 50,000 for literary, and some 2,000–4,000 for elementary, use (and the Chinese language is particularly well suited for this form of writing). In the case of languages with a complex grammar and a large number of purely formal words (Japanese, for example), additional aids might have to be sought to accommodate all needs.

We have discussed the disadvantages of phonetic scripts, namely their dependency on one particular language, the fact that ideas have to be translated into sounds and that these sounds must then be made visible in the form of conventionalized (mostly abstract) signs which in turn have to be retranslated into the sounds of the (same) language and back into the original idea. Also, once a language has an established (written) form, any subsequent sound changes can only be accommodated by orthography, with the consequence that divergencies between the spoken and the written form can become considerable (English is an example). The same applies if an established phonetic form of writing is used for a language, or languages, with a different sound structure (see the Indian-derived scripts of Southeast Asia). On the other hand the advantages of a phonetic script — consonantal, syllabic or alphabetic — are considerable. In comparison to the 50,000 (or at least 2,000) Chinese characters, or the 700 or so Egyptian hieroglyphs, syllabic, consonantal and alphabetic scripts can manage with twenty to sixty signs. Information storage becomes thus more economic, less labour-intensive in relation to the time required to learn, read and write the script, and information can be stored in less space. In short, phonetic scripts are generally more cost-effective.

What kind of society can function with an ideographic form of writing (idea and thought transmission), using symbols and signs not yet fully codified or conventionalized, leaving a good deal to chance, individual imagination and an auxiliary background of commonly shared experience in both writer and reader? And what societies need for their survival and existence codified and economically usable systems which move towards and eventually reach a purely phonetic stage?

Scripts based on thought or idea transmission are perfectly adequate for societies with a pre-capitalistic structure of economy. Here much depends on individual effort, or group efforts based on loose and often temporary bonding such as happens among hunters, primitive herdsmen or simple agriculturists, who may, for mutual benefit, form groups (but not states) whenever the occasion demands it. This is the epic (some would say magic) stage where religion and society, history and legend are closely intermixed, with strong oral traditions helped perhaps by memory aids, notices or pictorial narratives.

On the other hand, societies which depend on coordinated labour efforts for irrigation, for example, which produce enough surplus to support a growing number of non-producing specialists, which assemble permanently in large and increasingly more densely populated areas (cities), need, sooner or later, some centralized form of organization; and

centralized organization depends on an effectively functioning administration. One of the characteristics of this type of society is the high value it places on property, and the concept of property is by necessity interrelated with the idea of a state. Property may belong to an individual, a family or a group (as it did in the pre-capitalistic societies), but ultimately all property (producer, owner, the family and the group) must in one way or the other belong to the state — the state being the sum total of all goods, lands and persons. Since property, especially the surplus of property on which the new prosperity depends, can now only be obtained by communal efforts, such a state needs laws to coordinate and control property and those who produce it, and needs to provide protection from outside as well as inside disturbances. The yearly inundations of the Nile could only have been utilized by an efficient, centrally organized administration. If property is important, then the legalized transfer of property, namely trade, needs equal safeguards. Trade and administration are transient affairs which have to be carried out with a reasonable amount of speed and a reasonable amount of unambiguous exactness. For this purpose a small number of signs which can be quickly learned, written (perhaps on perishable material in a cursive hand) and read, offer definite advantages over the ambiguity and/or complexity of a script based on idea transmission.

Most codified forms of writing using (a varying amount of) phonetic elements developed in capitalistically-orientated societies with a primitive technology: between 4000–3000 BC in the Fertile Crescent, about 2000 BC in the Far East (the very latest discoveries may add another millennium to this date), and perhaps around 1000 BC in Central America. Indeed many of the early documents written in those scripts relate to property. In Mesopotamia, Egypt and the ancient Aegean we come across lists of goods sold, transferred or received, letters, contracts, administrative accounts and records. There are also (usually on permanent material in a more monumental style) edicts of kings and references to deities — who are perceived as similar, often identical, to the temporary rulers of the land. Only gradually, and in many cases after a good deal of controversy, does the new codified form of writing replace oral traditions in the field of religious and secular literature.

How phonetic elements developed, how they were used, manipulated, differentiated, at times restrained, in their development, will be discussed later. Nowhere however was the evolution of writing truly linear; idea transmission does not lead automatically to the creation of a completely phonetic script. There are odd twists and curious retentions which may often look illogical and cumbersome, even unnecessary, but they always serve an overriding social need.

Idea transmission

The practice of representing data directly, without the intermediary of language, goes back to the dawn of human history. Ideas can be transmitted visually by various means: by objects, by abstract and/or geometrical patterns and designs, or by pictorial representations of human beings, animals, plants and objects. In many cases a combination of two or all three elements is used to store a particular piece of information.

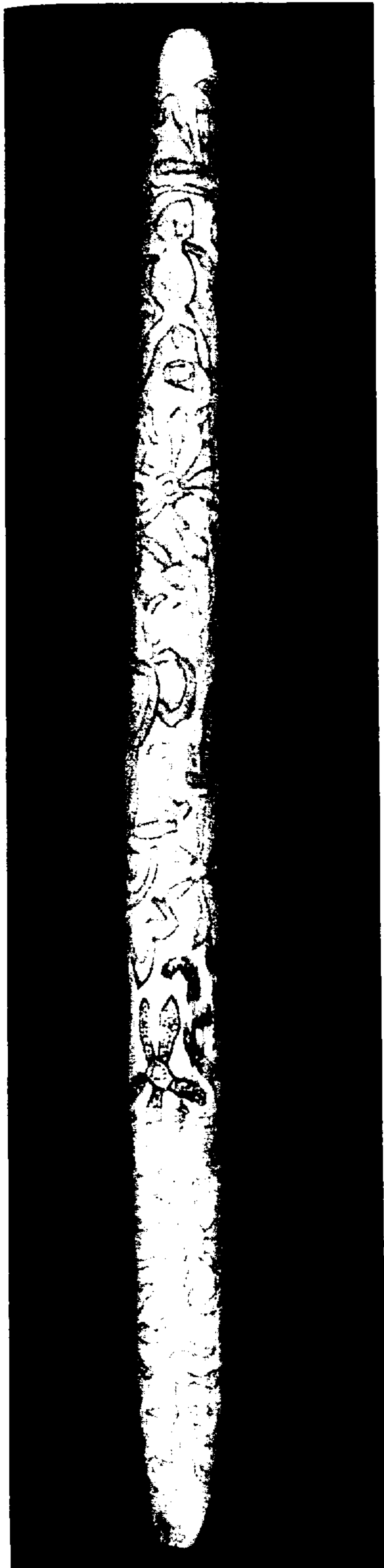
Objects can communicate warnings (grass and leaves scattered over a side-track to indicate that it is best avoided); they can indicate direction (a branch stuck into the ground pointing to the direction where a person has gone or should go); they can be used to recall an event, a place or a person (stones piled over a grave). Herodotus tells the story of a Scythian ruler who sent the gift of a bird, a mouse, a frog and seven arrows to Darius, which were variously interpreted to the Persian king as either an offer of surrender (equating the mouse with the Scythians, the bird with their horses and the arrows with their arms which they were about to surrender) or a declaration of defiance (the Persians would be killed by the arrows if they did not fly away like birds, hide in the earth like mice and leap into the water like frogs).

By modifying or decorating objects (painting, carving, engraving) or by artificially creating (decorated) objects, an already remarkably high level of information storage can be reached. There are for example the message sticks of the Australian aborigines (fig. 1) — rounded wooden batons, sticks or tablets incised with marks, grooves or nicks. Often the incisions were made in the presence of the actual messenger and the importance of each mark was carefully explained to him. Message sticks were an essential part of aboriginal culture, linking together widely-scattered members of the community; and carrying such a stick would in many cases ensure safe conduct through hostile territory.

The Moche, a pre-Inca people from Peru (see p.78) used beans marked with dots, parallel lines, and/or a combination of both, for sending messages. Leather pouches filled with such beans have been found in Moche graves. They also feature quite prominently in scenes painted on pottery vessels, where runners are frequently depicted carrying them with exuberant determination (fig. 2).

The wampum belts of the Iroquois of North America (fig. 3) combined the use of patterns and colours for the transmission of messages; they were also used in ritual, ceremonial, as currency, and for personal decoration. Wampum belts were woven on a bow-loom in a manner analogous to other forms of weaving, and decorated with cylindrical beads made of sea-shells, winkles, whelks and clams. Most belts included designs in one colour on a background of another; no further colours were used. Dark colours signified solemnity and gravity, standing for danger, hostility, sadness and death. White stood for happiness, and red for war. More elaborate belts interwoven with coloured symbols could be used as declarations of war (a black belt with the sign of a tomahawk in red, for example), or as peace treaties (two dark hands on a white background), and so on.

Linguistic elements can already play a part, either by an association of ideas or an association of sound. Many of the decorations found on Ashanti houses, objects or utensils represent definite ideas expressed linguistically in the form of proverbs. For example, the



1 Message stick from the Murchison District; Western Australia. (British Museum; Museum of Mankind; 1901. 10-16.1)



2 Moche vessel showing runners carrying pouches filled with decorated beans; Peru c. 200 BC-750 AD. (British Museum; Museum of Mankind; 1909. 12-1983)



3 Wampum belt from northern America. (British Museum; Museum of Mankind; 1906. 5-23-1)



4 Ashanti pipe showing a sankofa bird (right side of stem) turning its head backwards, representing a proverb: Shana, West Africa. Many images of Ashanti art are valued not only for themselves but for the verbal expression they call to mind. Proverbs are thought to summarise traditional wisdom and those aspiring to high office were expected to know hundreds of them. (British Museum; Museum of Mankind; Cb/B)

image (carved on a pipe) of a bird turning its head backwards can express the sentiment 'a person should not hesitate to turn back to undo past mistakes' (fig.4), and that of a crocodile grasping a mudfish in its mouth can stand for proverbs such as 'only a bad crocodile eats a creature which shares the same hole in the river bed' or 'if the mudfish gets anything it will ultimately go to the crocodile' (MDM, p.48).

An even more sophisticated way of conveying messages through objects is known to the Yoruba of Nigeria, who use cowrie shells for this purpose. One cowrie shell denotes 'defiance and failure', two placed together 'relationship and meeting', three placed apart 'separation and hostility'. Six cowrie shells mean 'attracted' because in the Yoruba language the word *efa* means both 'six' and 'attracted'. A string of six cowrie shells sent to a person of the opposite sex means 'I am attracted to you', and a string of eight shells returned to the sender stands for 'I agree, I feel the same' since *ejo* means 'eight' and 'agreed' (AS, p.16).

The ability to store numerical information has always been an integral part of writing (with the Mayas, for example, Hebrew script, and the Roman alphabet). Pebbles, shells, beans, beads or pieces of wood (fig. 5) can be used to store numerical data. On a more sophisticated level, tallies and knotted cords fulfil the same role. Tallies are usually sticks or rods of wood (sometimes also poles, house walls, doors etc.) into which notches or grooves have been cut to record the existence and memory of particular objects, numbers or events — such as the number of animals hunted, enemies killed, men or horses required in a particular camp, the days of a journey or the duration of an absence from home, the number and (depending on the type of individual marks) quality of goods sold, and so forth. The main purpose of the tally however has always been the recording of debts. Once a stick has been marked it can be split lengthwise, giving both the creditor and the debtor an incorruptible account of the amount of money or goods involved. Tallies have been used

5 A tally (kupe) from the Torres Strait Islands. (British Museum; Museum of Mankind; 89 + 122)



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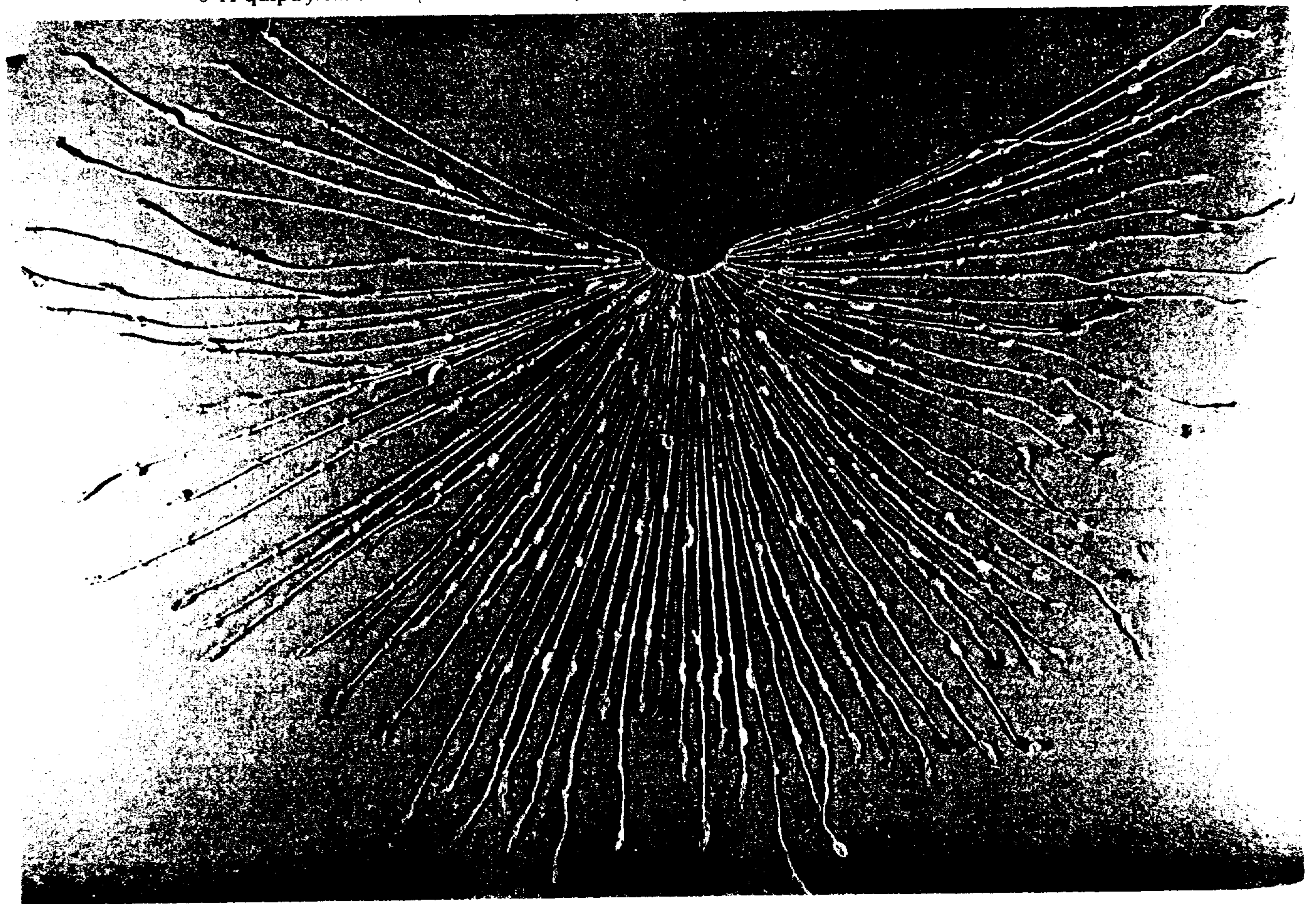
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in most parts of the world and by nearly all societies. Some scholars have even suggested that the tally was important, if not instrumental, in the development of the Chinese script (HJ, p.27). In England the chief interest of the tally centres around its public use. Soon after 1100 AD tallies became recognized forms of receipt for payments into the Royal Treasury, a situation which continued until 1826 (hence such terms as 'tally clerk').

The use of knotted cords was equally widespread. Though normally a means of enumeration, a memory aid for the keeping of statistical records, knotted cords have also been cited in connection with the development of writing. In this context they are supposed to have been used in ancient China, Tibet, Japan, Siberia, Africa, California and the Polynesian Islands. In Hawaii they played an important role in the gathering of taxes; and in the Solomon Islands strings with knots and loops are still used for the exchange of news. The best-known and most accomplished version of the knotted cord is the *quipu* of ancient Peru. (fig. 6). *Quipus* were a highly efficient means of information storage, and Inca (see p.77) administration greatly depended on them. They may also have been adapted, at least in part, to the sounds of the Inca language.

6 A quipu from Peru. (British Museum; *Museum of Mankind*; 1907. 3-19. 286)



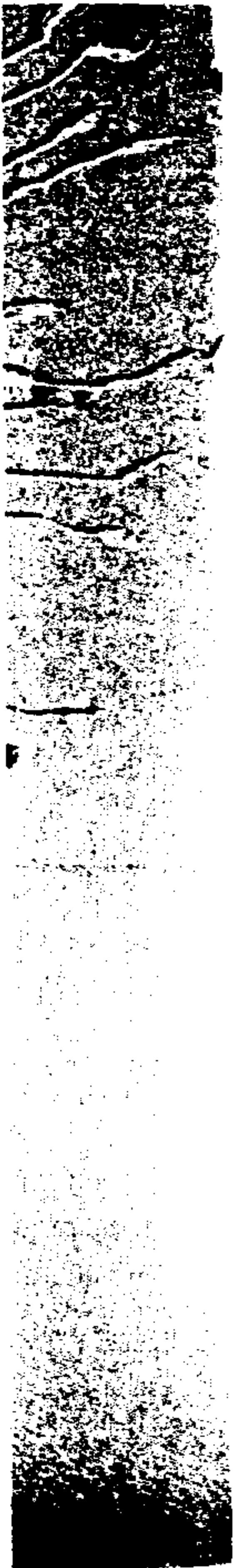
Geometrical and abstract symbols and signs such as circles, wheels, loops, combs, triangles, arches, spirals, zigzag lines etc. are already to be found — sometimes side by side with figurative representations, often alone — in a large number of prehistoric and later rock-drawings. Their exact meaning is still largely enigmatic, but they seem to have been a constant (archetypal?) feature, reappearing again and again in connection with property marks, marks of identification and distinction and (later) scripts. In the case of scripts, such signs are mostly, though not always, abstractions of previous picture signs, but attempts to interpret signs found outside the realm of systematic writing (the majority and the most ancient ones) remain largely speculative.

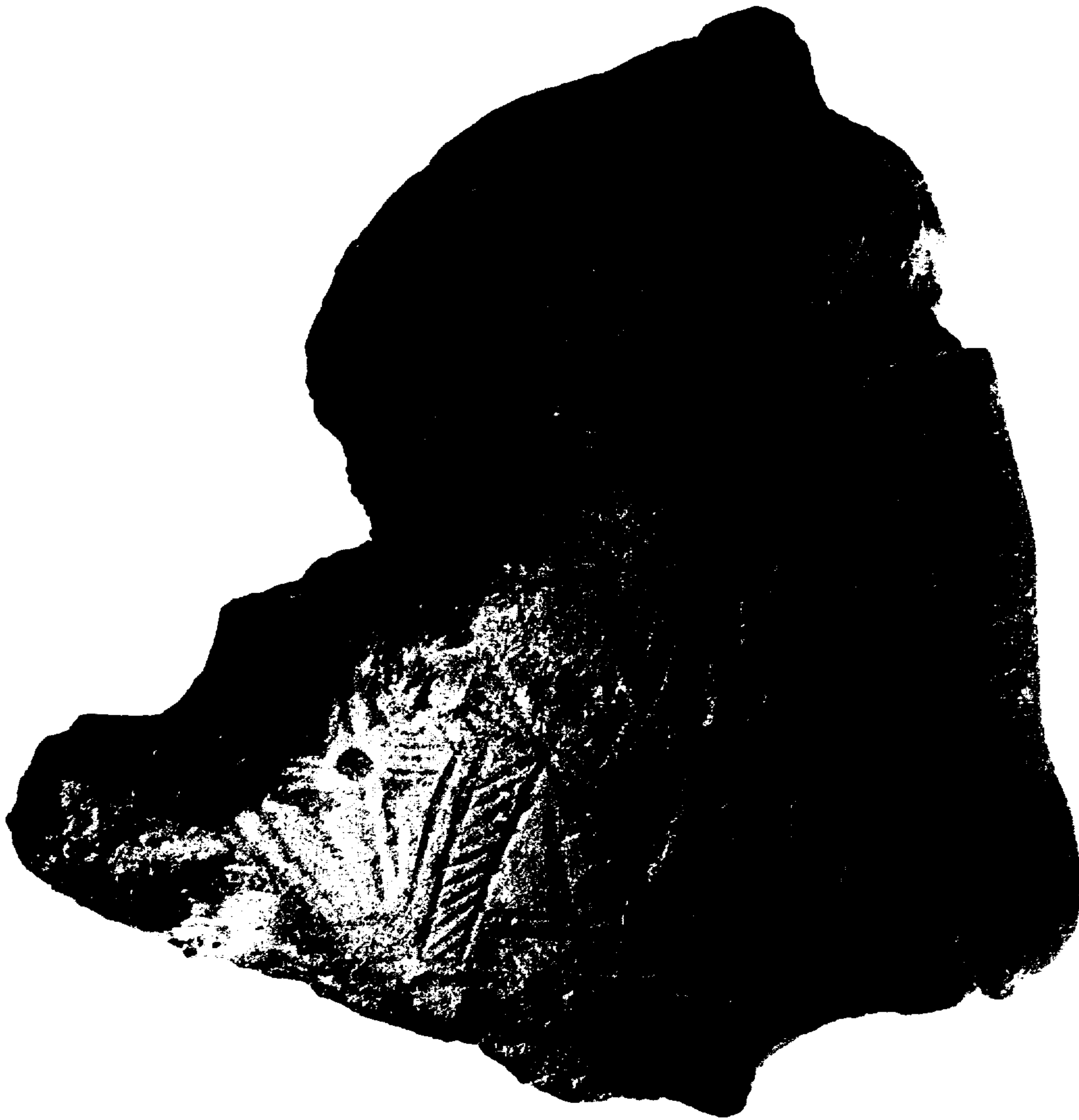
When, at the turn of the century, the French scholar Piette discovered in a cave near the Spanish border small pieces of flint dating from c. 12000–8000 BC which were decorated with signs painted in red and black, the outer appearance of some (though by no means all) signs tempted a number of scholars to speculate, not very convincingly, about possible connections with signs found in fully-established phonetic systems of writing such as the Aegean syllabaries, the Semitic consonant scripts and even the alphabet (HJ, p.37). But apart from the long time interval (some six to eight millennia) and the fact that similar signs have also been found on pieces of stone, on pebbles, beans, or rock-faces, in areas geographically (and historically) far removed from the Mediterranean, any comparison based entirely on the outward appearance of individual signs more or less chosen at random from two entirely different forms of information storage, one known (script), the other unknown, is usually quite meaningless. More plausible, but in the end equally uncertain, are attempts at an internal, representational interpretation — for example, circle for sun, comb for woman/spinning, spiral for womb/sun/water-hole and so on — which suggests that such signs are conventionalized simplifications of earlier pictures.

Geometrical signs, symbols and patterns are frequently used as property marks. Property marks are in many ways already a utilitarian form of writing; they can act as 'signatures', establishing authority, indicating ownership. They are closely connected with elements congenial to the development of systematic writing; a growing awareness of the importance of personal property, a realization that in a differentiated society property can bestow status, a desire to protect and/or exchange such property and the realization that property must be administratively identifiable.

In ancient Mesopotamia (see p.65) seals bearing personal patterns (fig. 7) which served as 'signatures' were already used in the 4th millennium BC. After 3000 BC, with trade and commerce rapidly gaining prominence, their importance increased. Writing had by then become well-established, but it was a complex art practised mainly by a professionally-trained class of scribes. Traders needed quicker and simpler means of identifying their belongings, authorizing their contracts, marking their property. The connection between seals, property marks and systematic writing is an interesting one. The still enigmatic signs on the seals from the Indus valley (see p.67) are a case in point.

Simple forms of property marks have been used in all ages and by nearly all people. Nomadic herdsmen and settled cattle-breeders alike have always used them, right up to the present time, for the branding of their livestock. Societies with an economy dependent on slave labour have similarly employed them. On a different and more rarefied level, branding and tattooing can be a voluntary indication of the complete identification between an individual and a deity, or an individual and a specific group. Into the same category fall clan and house marks, which have sometimes been used as signatures by people unable to read and write. The pottery marks from ancient Egypt have their modern equivalents in ceramic marks and in the hallmarks made on silver and other precious metals. There are furthermore the marks of masons from the ancient Aegean region, from Palestine, Anatolia





7 Seal impression marking property; Mesopotamia c. 3000 BC. (British Museum; Department of Western Asiatic Antiquities; 1930. 12-13. 423)

8 Staff recording the genealogical history of the Ngati-rangi-toke tribe; New Zealand. (British Museum; Museum of Mankind; 54. 12-29. 22)



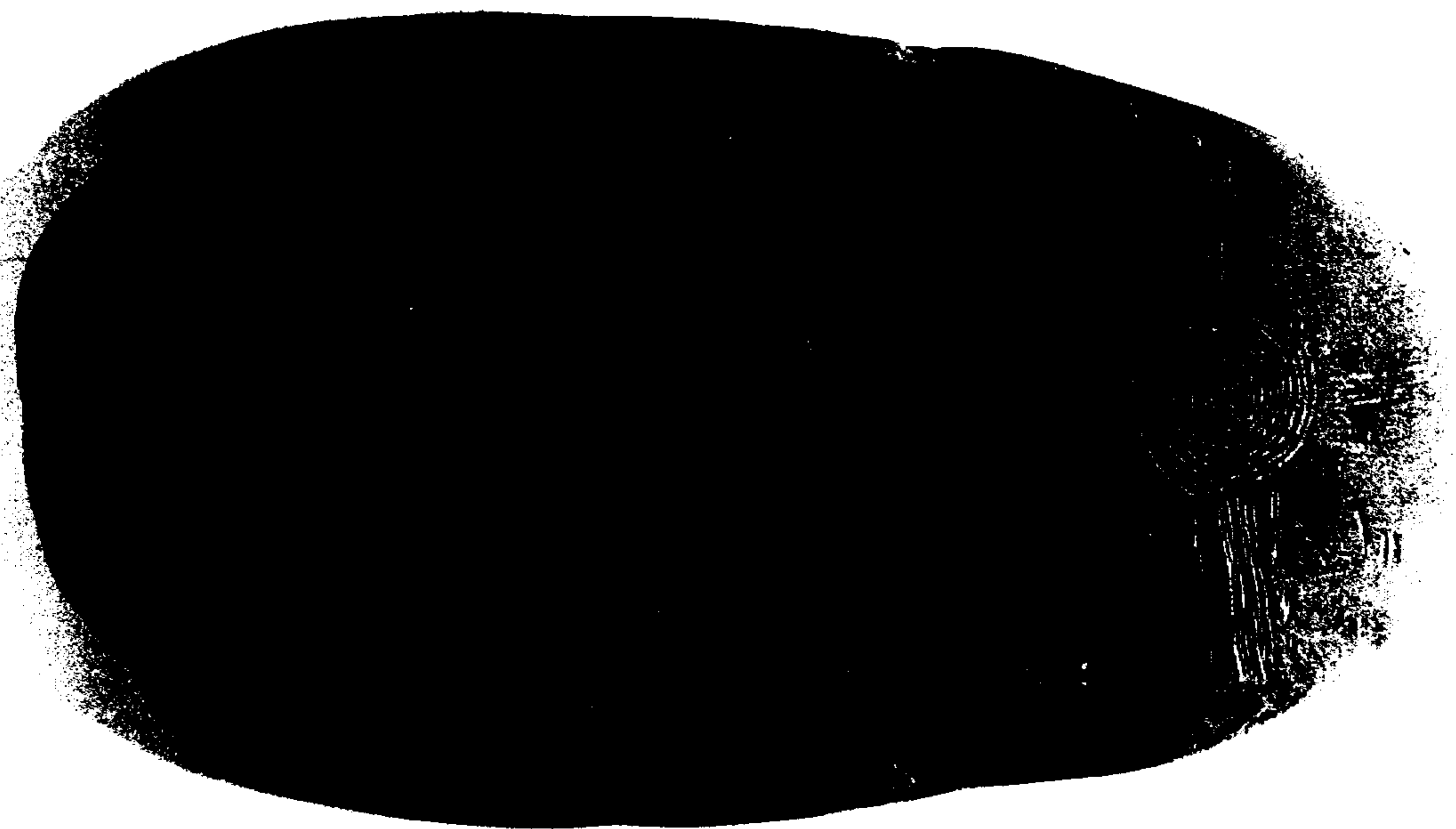
or medieval Europe, the various trade and inn signs, and the heraldic devices which proclaim identification with a particular (usually prestigious) family or lineage. Such signs and symbols (as indeed regimental badges, banners, national flags etc.) indicate proprietary rights, the belonging of a person, an animal, an object or a piece of land to a group, a clan, a family, a deity, a country or simply another human being.

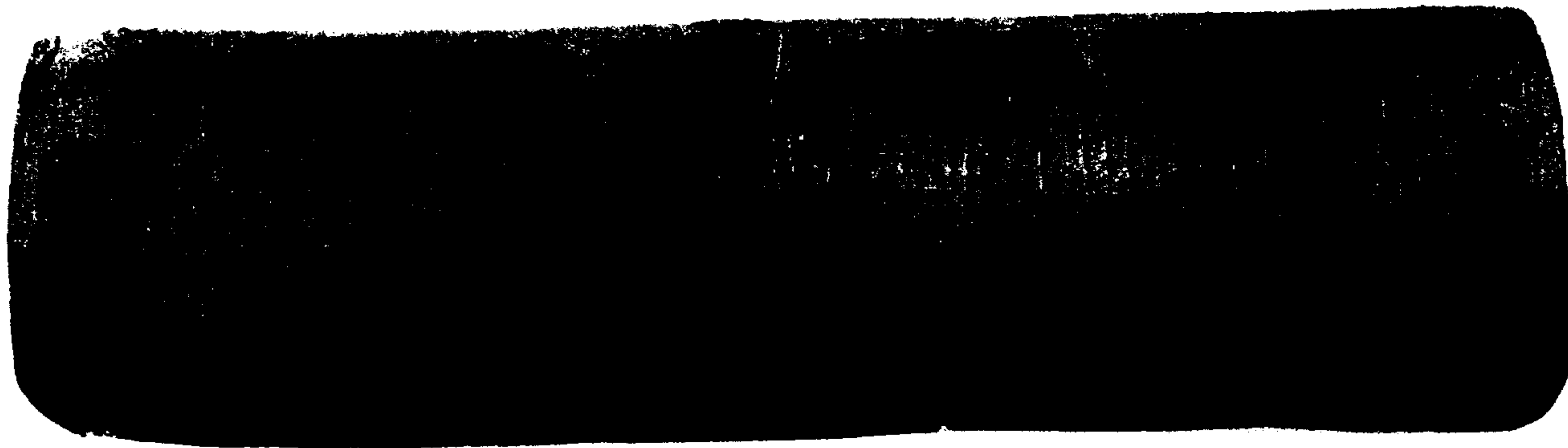
Helpful to the communication and retention of data are mnemonic devices or memory aids. 'Memory aids' cover an exceedingly large area of information storage; indeed up to a point all writing is a form of memory aid. Memory aids hold a transitional position between oral tradition and writing, often being made legible only by skilled interpreters conversant with their own cultural heritage and traditional methods of explanation. Such interpreters can wield considerable power and influence, since it is left to them to decide how much of the information thus stored should be disclosed to which section of society. Often the interpretation of memory aids depends on additional, orally transmitted — perhaps even secret — knowledge.

Memory aids can be simple objects, decorations on objects, symbols, signs, patterns, single or narrative pictures. Some memory aids are highly sophisticated and already cross the boundaries between pure idea transmission, picture-writing, pictography and phonetic script. Memory aids can be important records and archives of tribal life, storing sacred and profane history, referring to legends and actual events alike.

The Maori of New Zealand for example used saw-shaped wooden boards called *he rakau whakapapa* (*rakau* – wood, *whakapapa* – genealogy) to keep their genealogical records (fig. 8) and youths were taught to recite the name of each ancestor with reference to each notch. The *churingas* (fig. 9) of the Australian aborigines (stone plaques or wooden tablets engraved with abstract line designs) relate to man's distant ancestors, mythical beings who

9 A stone churinga from Central Australia. (British Museum; Museum of Mankind; 1935. 4112.1)





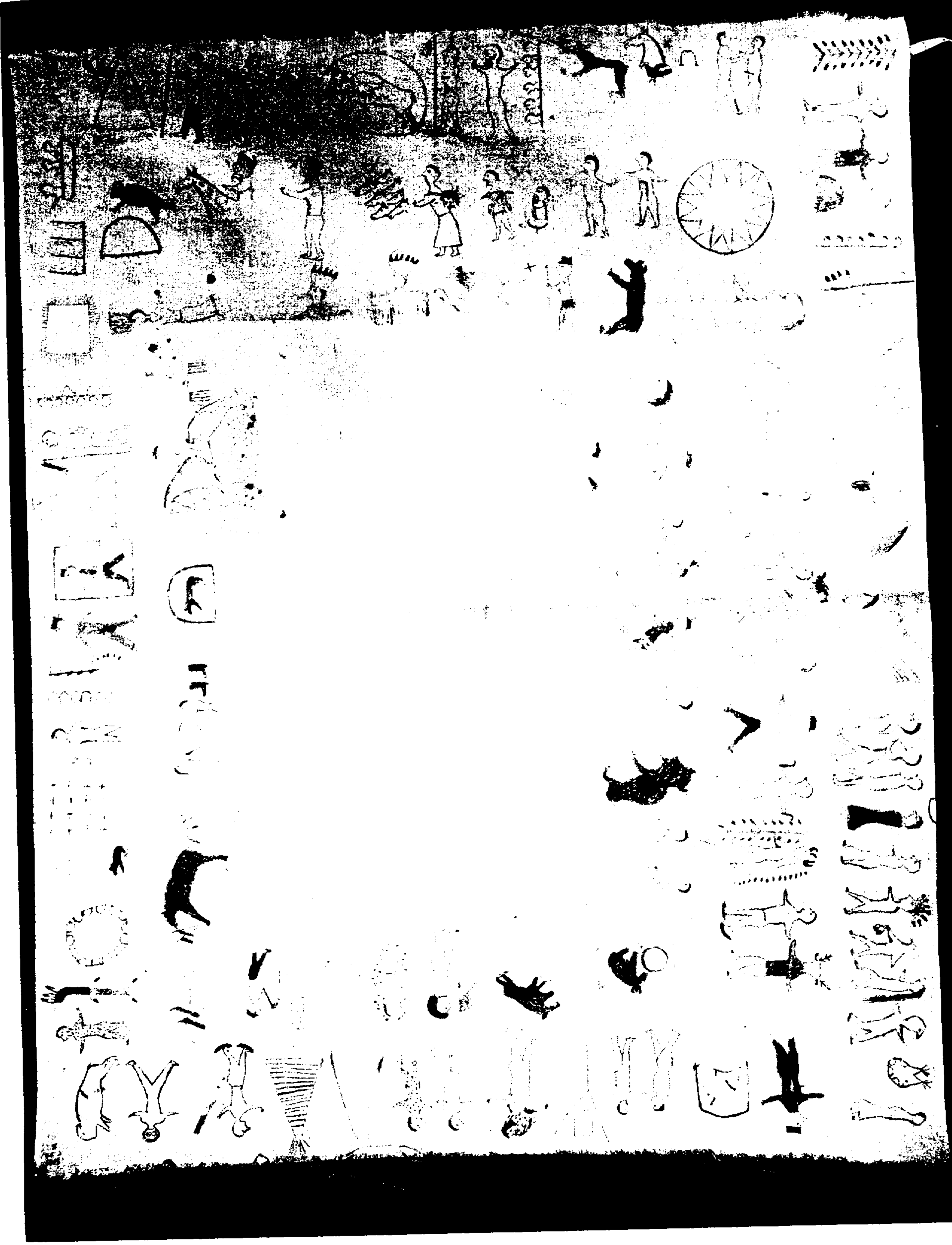
10 *Mide scroll with pictures recording traditional lore. Collected from a Minnesota Ojibwa Chief, c.1850. Such scrolls relate to the Midewiwin, the Medicine Dance, which still exists in Ojibwa and other Great Lake communities. (British Museum; Museum of Mankind; 1949. AM. 22. 170)*

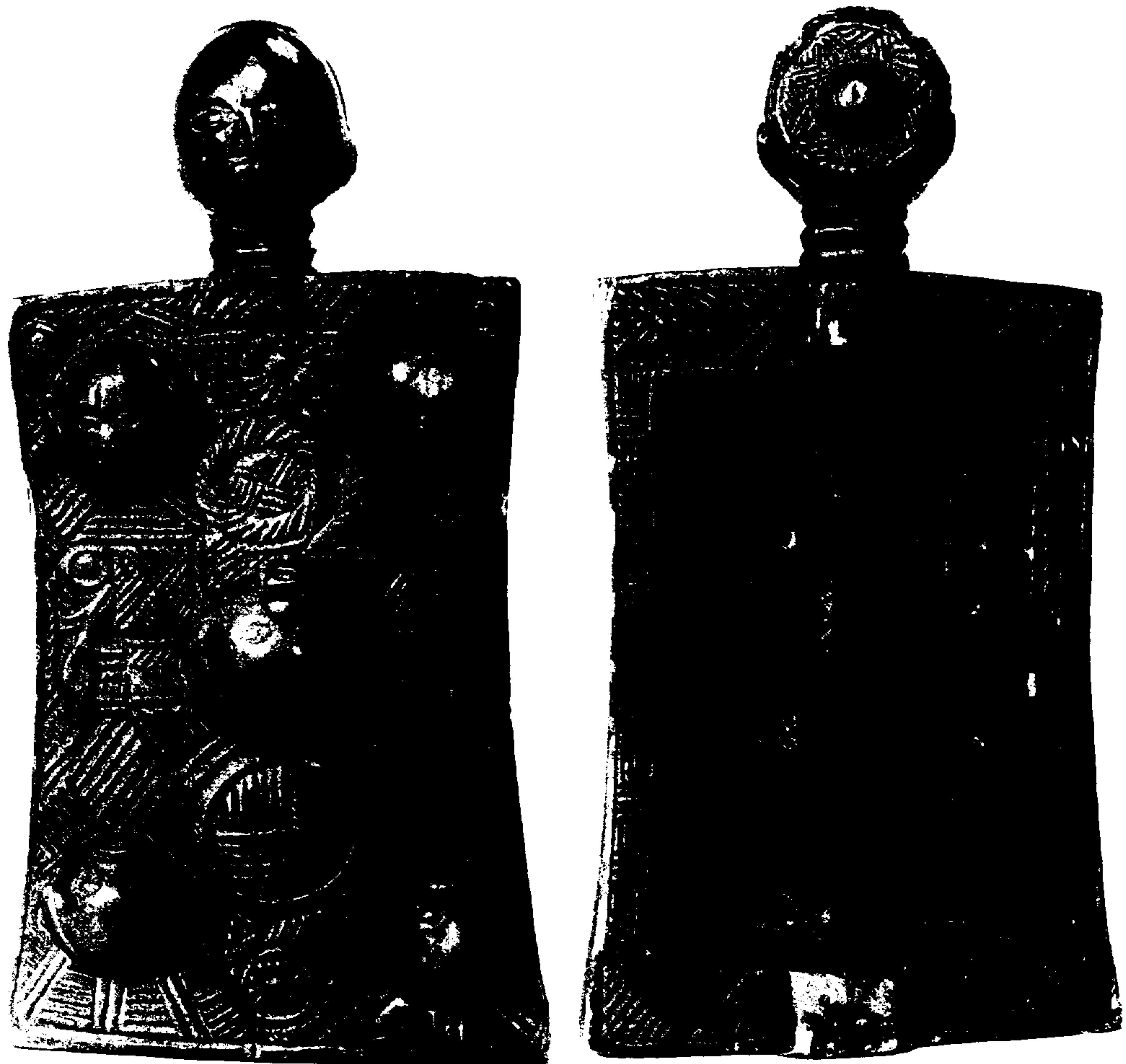
11 *Dakota winter count from northern America. (British Museum; Museum of Mankind; 1942. AM. 7-2)*



had the characteristics of both man and animal and who, during 'dream time', moved about the as yet physically undifferentiated country. By their actions the 'dream time' heroes shaped the environment and set precedents which still govern human conduct. Each *churinga* tells a story connected with a particular totemic creature and the land on which the clan lived. *Churingas* were hidden in sacred places which women and uninitiated youths were forbidden, on pain of death, to visit.

North American totem poles record family (clan) history, legends and important events. Similarly much of the knowledge necessary to perform the *Midewiwin*, or Medicine Dance, of the central Algonquin peoples, as well as the memory of the dances and songs performed at the meetings of the Mide society, is inscribed on song-boards or birch-bark scrolls (fig. 10). The winter counts (fig. 11) of the Dakota Indians give a chronological account of the most recent history of the group and act as annals for the whole community. They can span a period of up to seventy years, each year being characterized by an outstanding and memorable event. For example, a drawing of the head and body of a man covered with red spots records the fact that many people died of smallpox; while three columns of ten parallel lines each drawn in black means that thirty Dakota were killed in the course of a particular year.





12 Lukasa, a mnemonic device used by the Luba people of Zaire in passing on mythological and moral lessons to initiates to the Luba secret society. The front of the board shows anthropomorphic carvings in high relief, the back depicts a turtle, an often used mbudye symbolism; from the northern Shaba region (formerly Katanga Province), Africa. (British Museum; *Museum of Mankind*; 1954. Af. 23. Q.)

Memory aids can also play a role in the secret and political life of the community. An example is the *Lukasa* (fig. 12), the 'long hand' (or claw), an esoteric memory device that was created, manipulated and protected by the *mbudye*, a once powerful secret society of the Luba people of Zaire (Africa) (TQR, p.49).

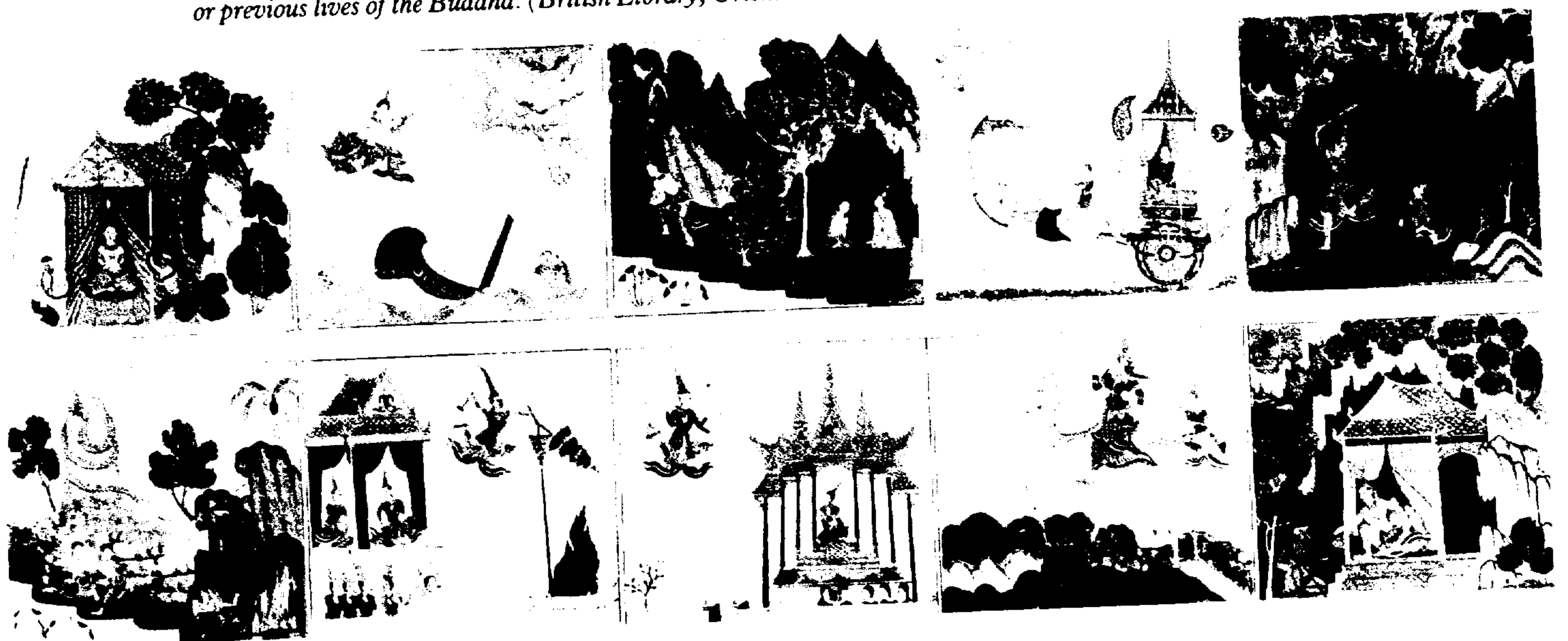
As we have seen, objects (Yoruba love letters) and decorations (Ashanti proverbs) can already establish links, albeit tentative, with linguistic and phonetic forms of information storage; but the decisive transition from idea transmission to a more systematic and ultimately phonetic form of writing was probably made in the realm of memory aids. The usual picture-writing of the North American Indians, for example, is generally referred to as *kekewin*. There exists however a second form of picture-writing called *kekinowin*. The latter is known only to the priests who use it to memorize the correct order, and also the exact wording, of magic spells and incantations. Here the pictures represent not an idea or concept or event, but a definite sentence or verse, and in each case there exists only one possible spoken form to correspond with one particular picture. The pictures are read, in fact, exactly like a text. At an even more sophisticated level, memory aids can be integral elements of an already (partly) phonetic script. The writing of the Aztecs of Mexico (Plate I) was to some extent a form of memory aid which could be made legible only through the intermediary of trained interpreters (see p.76).

Memory aids are by no means a thing of the past. We tie a knot in a handkerchief to remind us of a task which must not be forgotten; devout persons use rosaries, where the size and position of the beads help to recall the correct order of certain prayers; children (and not only children) draw lines on calendars (or walls) to mark the days left until the start of the holidays or other pleasurable events.

Pictures have always been an important means of information storage. The paintings of animals, human beings and objects found on the walls of subterranean caves in places such as Altamira (Spain) or Lascaux (France) may or may not have been connected with magic, but they were certainly meant to store (and communicate) information — information essential to the social and economic life of the people who created them. Rock pictures, either painted (petroglyphs) or engraved (petrolyphs) can be found in most parts of the world, from Europe to Africa, America, Asia, Australia and the Polynesian Islands. Their dates vary greatly. Some, such as those of Spain and France, may date back ten, twenty or thirty millennia; the so-called cup sculpture of Scotland perhaps only some 4,000 years (RWBM, p.13). In North America rock pictures were incised (pecked) into stone until the advent of white settlers, and the drawings of the Bushmen of southern Africa are more or less contemporary. Some drawings are remarkably realistic representations of animals and/or human beings; others are highly stylized. Sometimes the figures and objects seem interrelated, giving the impression of a definite event (hunt? ceremony? gathering?); sometimes they stand in no recognizable relation to each other, sometimes they are superimposed one on another, obviously having been executed during different periods.

Pictures are highly versatile. They can express ideas, thoughts, sentences, words and ultimately sounds. The difference between a picture and picture-writing lies mainly in the fact that the former make a single statement (the picture of a buffalo simply represents the physical appearance of that animal), whereas the latter is narrative in intent (a group of buffaloes surrounded by armed human figures tells the story of a hunt). In both cases the elements of art and information storage are still almost totally merged, as they are in the case of some Southeast Asian picture-scrolls (fig. 13) where the 'reader' assimilates the

13 A folio for Captain James Low's (c. 1795–1852) *Siam book* depicting the Last Ten Birth Tales or previous lives of the Buddha. (British Library; Oriental Collections; Add. 27370, ff. 11/12)



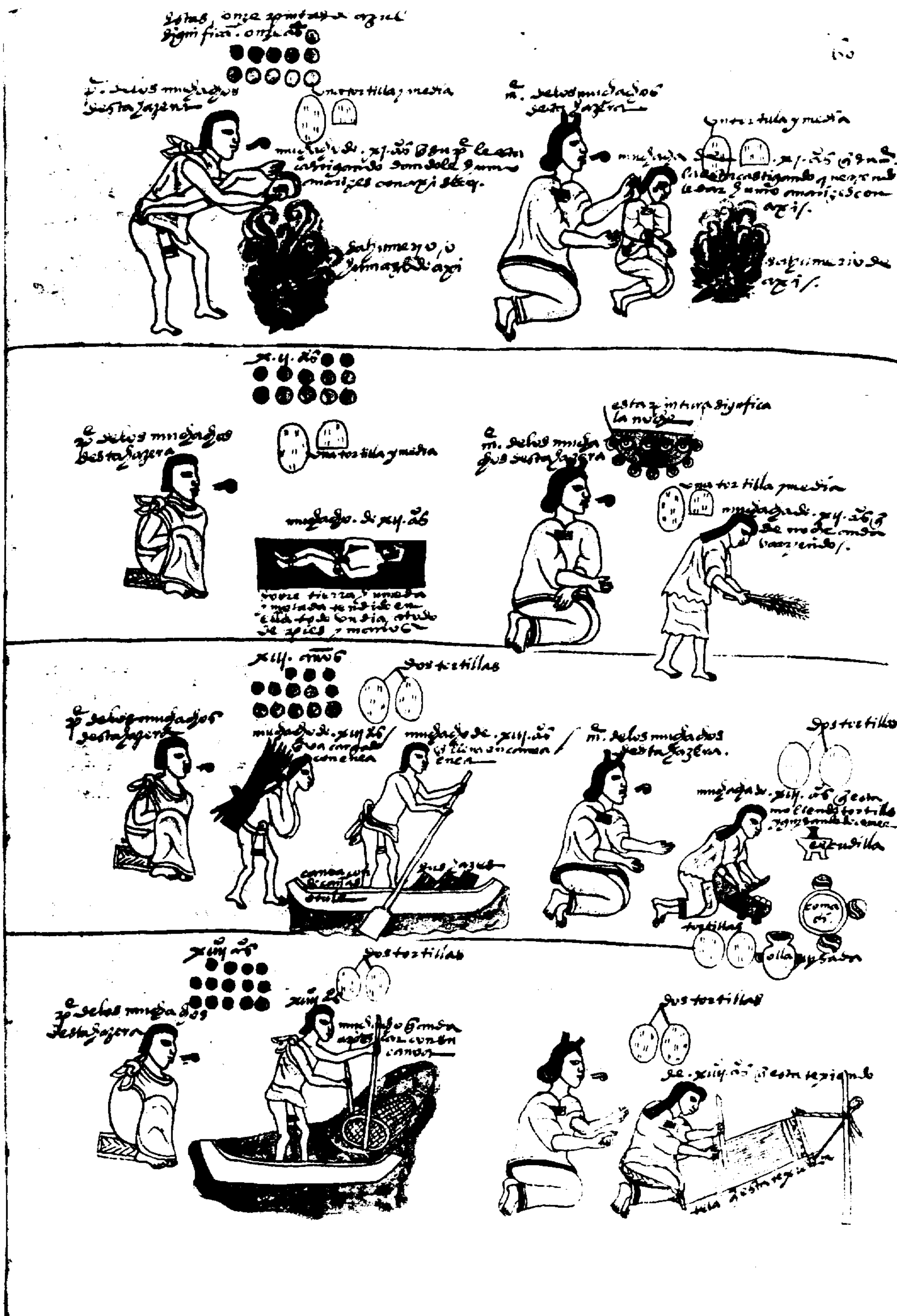
information through the medium of art. The difference between picture-writing and pictography (Egyptian hieroglyphs and similar forms of writing), on the other hand, lies mainly in the fact that pictography has already reached a quite high level of abstraction, codification and conventionalization as far as the shape of individual (picture) signs is concerned. In pictography each sign has, at least to begin with, a definite meaning, corresponding in most cases to one word of a particular language. The signs used in picture-writing acquire meaning mainly through their combination with each other. They are meant to represent the whole thought-process as opposed to breaking the thought-process into the phonetic components of a particular language — words, syllables, consonants, vowels. In pictography the number of signs is more or less static; they can no longer be chosen or increased at random. In fact the tendency is for a move towards economization and a decrease in the number of signs (here Chinese is again the exception). In addition the order of the (picture) signs follows in most cases certain (syntactic) rules. In other words, linguistic (and eventually phonetic) elements are becoming an important component of information storage.

Picture-writing and idea transmission are still very much part of our everyday life. A person can drive from Edinburgh to Marseilles without understanding a single word of either French or English, and obtain all necessary information by way of pictures and symbols. Such a traveller will be kept well informed about which turning to take where, which road has the right of way, where it is advisable to drive more carefully because of roadworks, accidents, railway crossings, floods, bridges (or no bridges); where there are areas suitable for rest and recreation; where food, drink, petrol, perhaps even a bed for the night, are available. In addition to such notices and warnings, the traveller learns about the history and the most desirable features of the environment surrounding the vicinity of the main road; where there are abbeys, walled cities, a fortified castle, prehistoric remains worth visiting, a forest with rare animals (and what type of animals), the most important crops of the area, provision for sailing, boating, riding, pony trekking, fishing, golf, shooting, whether there is a beach nearby, a swimming pool or simply a very good vineyard which may make an overnight stop worthwhile (Plate II).

Pictures and symbols are important aids to international trade and commerce. A garment may have been made in Japan, Hong Kong, Korea, Taiwan, Germany, Brazil or India by people speaking no common language and unable to read each others' scripts, but somewhere inside it there will be a label with signs telling us whether it should be dry-cleaned, hand-washed, drip-dried, ironed (with a hot or cool iron), and whether it can be bleached. The weather forecasts on television can comfortably be understood by anybody, without any knowledge of the language used by the newscaster; a more or less internationally accepted series of pictures (a stylized black cloud for rain, a stylized white cloud with yellow or white lines radiating from it for sunshine, a cloud with suitably shaped symbols for snow) tell us what to expect for the next day or the coming weekend.

We are surrounded by picture-writing. Some of the signs and pictures have become internationally accepted by common usage. Others, such as those used for safety, engineering, in science, medicine, pharmacy or for computer technology have more or less been agreed upon.

As new technology diminishes the importance of writing (see p.210) the picture becomes again a favoured form of communication. International travel, international commerce and the necessity for cooperation in matters of industry, safety, defence and trade have created the need for easily-understood — that is, more or less self-evident — forms of communication and information storage which can transcend the boundaries of language. An interesting development in this direction is the increased popularity of 'coffee-table



14 Codex Mendoza (Pt. 3), written for Don Antonio de Mendoza, the first Spanish Viceroy of 'New Spain' (1535-1550). The drawings made by the Mexican, Tlacuilo, depict the daily life of the Aztecs; the Spanish 'commentary' is based on explanations supplied by local informants. Folio 60 demonstrates the strict way children were disciplined and taught. (Bodleian Library, Oxford; Ms Arch. Seld. A.1., f.60)

books' which are more or less picture books using photographs and a minimum of text. Equally on the increase is the popularity of strip-cartoons either in serialized form or in the form of books, where drawings are annotated by simple sentences (of dialogue or explanation) written more or less into the margin — a method similar to that used, for example, in some manuscripts produced after the conquest of Mexico by Spanish or native scribes and artists (fig. 14).

Picture-writing takes us right into the future: Pioneer 10, the unmanned spacecraft launched in 1972, which has already left the solar system on its journey into space, carries as a message from mankind a gold-anodized aluminium plaque engraved with the drawing of a nude man and woman, with the man's hand raised in a gesture of greeting (to show what we look like and to indicate that we are friendly towards any unknown life-form the spacecraft may encounter), and a series of symbols which testify to the level of scientific and technological development we had reached at the start of the journey.

Language and writing

In the previous section we have already met examples of an elementary interaction between language and writing. One is the *kekinowin* picture-writing of the North American 'medicine men', where pictures no longer stand just for ideas or concepts but for definite linguistic expression: a visual sign equals a sentence in a definite language. Another, that from Nigeria, brings us even closer to a phonetic form of information storage. Six cowrie shells mean 'I am attracted' because the Yoruba word *efa* means both 'six' and 'attracted'. We have here, in embryo, one of the most important principles in the development of phonetic writing, namely the principle of rebus transfer. By one dictionary definition rebus means 'the enigmatic representation of name, word etc. by pictures etc. suggesting its syllables' (*efa* – six is being represented by the six cowrie shells). Rebus transfer occurs if, once the phonetic interpretation of a particular sign has been established, this sign is then used to represent another word which means something quite different but which sounds at least similar (*efa* – six, represented by six cowrie shells, becomes *efa* – attracted, still represented by six cowrie shells). This process can be taken further; the phonetic unit (word, syllable or consonant group) can be used to form a component of another word, even that of a different language.

As has already been pointed out, the connection between language and writing is by no means as self-evident and fundamental as we, on the basis of our own background and experience, might be tempted to think. The primary object of all information storage is the preservation of knowledge. Knowledge can consist of thoughts, ideas, facts, concepts; it can be totally visual as in the case of art, acoustic as in the case of music, numerical as in the case of mathematics, physics, chemistry; in fact knowledge constitutes the sum total of all (up to date) human experience. It is only in so far as knowledge is expressed through the medium of language that information storage becomes identical with written language. Even on these premises written language and spoken language are by no means always identical, neither in the representation of sounds through script signs (there are at least five different ways of pronouncing the vowel sign *a* in English) nor in the use of words, or the way sentences are phrased. One language can also be written in several different scripts. The ancient Egyptian language, for example, used simultaneously three different forms of writing: hieroglyphic, hieratic and demotic (see p.63). From the 2nd century BC onwards it was also written in the Greek, and from the 4th century AD onwards in the Coptic, alphabet.

The most remarkable disregard for the writing/language connection shows itself in the way a script, designed for one particular language, is at times adopted for the use of another, totally different, language. A striking example is the cuneiform script (see p.65), originally designed for the agglutinative Sumerian language in which syllables and vowels played an important part. This script was taken over by the Semitic Babylonians to serve a language in which the meaning of words depended on the grouping of consonants, and where vowels played only a subsidiary part. Similarly the Chinese script, designed for a language with practically no grammar and a large number of homonymous monosyllabic

words, was made to fit, with the aid of complex auxiliary additions, the agglutinative Japanese language, full of formal words and endowed with a very complex grammatical structure (see p.84). It could be argued that neither the Japanese nor the Babylonians possessed a script of their own, and that their choice was therefore limited and predetermined. But in our own more immediate past both the Russian Cyrillic and the Roman alphabet, being the scripts of economically and politically dominant groups, have been superimposed on a large number of Asian languages which already possessed perfectly serviceable forms of writing.

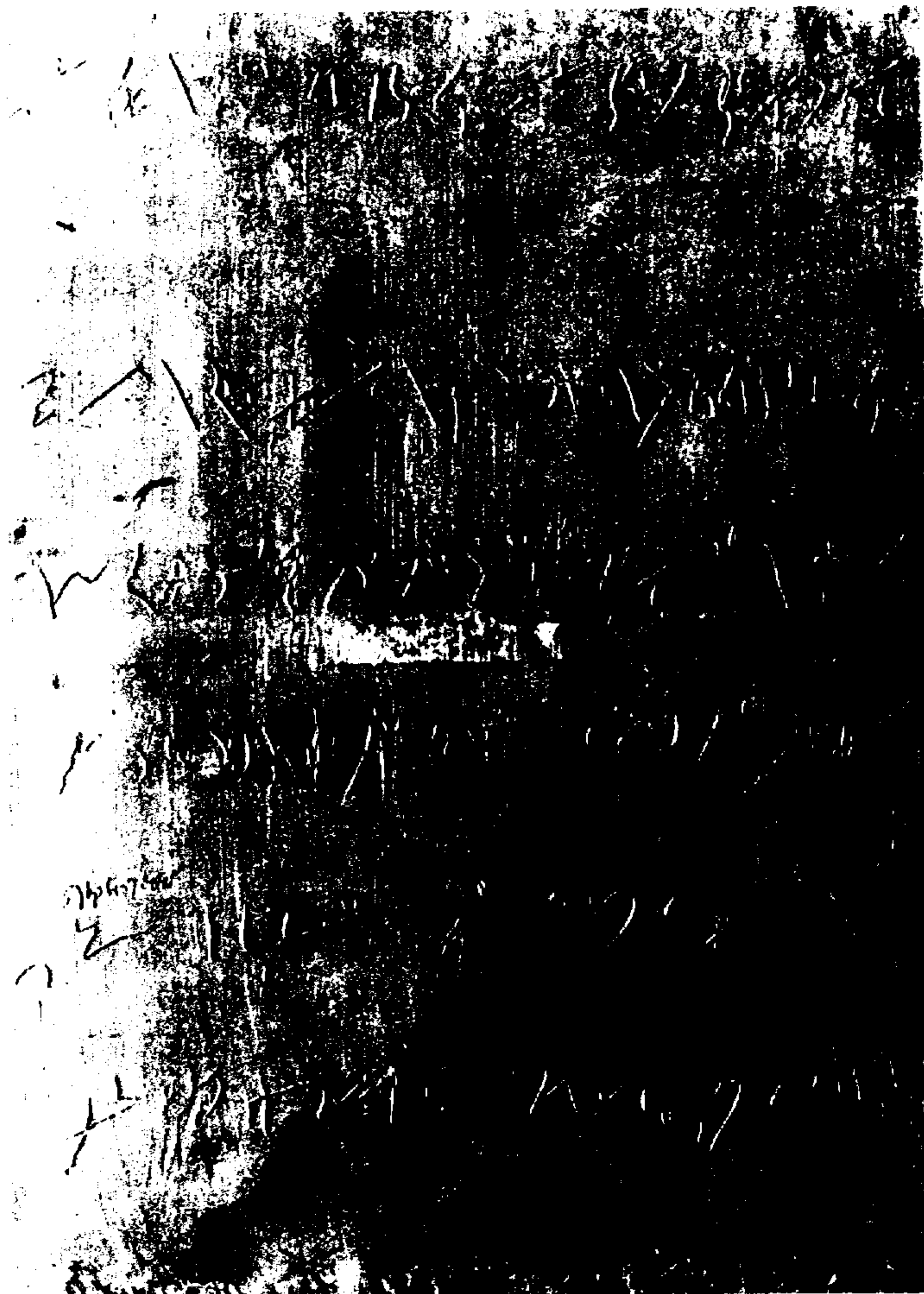
This of course does not mean that the connection between script and language is negligible or wholly arbitrary. As we shall see later, script, language and nationality (sometimes script and nationality alone) often become identified with each other, forming a strong and potentially powerful unit. During the long centuries of the Diaspora, the Hebrew script became a symbol of Jewish identity and was used for various languages in the countries of adoption. Thus Ladino (a Spanish dialect) and Yiddish (a German dialect) were both written in Hebrew characters, just as in Spain, during the period of Arab domination, the Jews spoke Arabic, but wrote it in the Hebrew script.

After the end of the Second World War a mission consisting of twenty-seven American educationists recommended to General MacArthur a drastic overhauling of the Japanese education system. They called especially for the abolition of the 'Chinese-derived ideograms', since otherwise Japan could never hope to achieve technological parity with the West (DD, p.174). Today Japan has not only achieved this parity, but seems uncomfortably close to overtaking the West, and this despite the fact that the Japanese still use their 'Chinese-derived ideograms', and that it takes Japanese schoolchildren two years longer than their Western counterparts to learn how to read and write. As we move towards the 21st century, the 19th-century concept of the alphabet as a Platonic idea towards which all writing (and information storage) must by necessity progress becomes less and less tenable.

The process of writing

The logistics of information storage necessitate objects on which this information can be stored: writing becomes writing when it is written down on some type of writing material. In the course of time (some 20,000 years if we take the concept of writing in its widest sense, nearly 6,000 years if we restrict ourselves to codified systems) any imaginable type of material has at one time or the other been used for this purpose: stone, wood, metal, animal skins, leaves, bones, shells, clay, wax, pottery, silk, cotton, paper etc. If we examine this list, and it is by no means complete, we can see that the materials named can be divided into two main groups — perishable materials and imperishable materials. And here we immediately come across one of the main difficulties in any study of the history and development of writing. Many ancient systems of writing, like those used in Egypt or India, seem to have appeared more or less fully-fashioned, simply because we encounter them first on imperishable material, mostly on stone. But as we know from later examples, writing on imperishable material is nearly always preceded (and accompanied) by writing on perishable materials: Roman-type wax tablets (fig. 15) for taking notes were still used in

15 *Roman waxed writing-tablets; 3rd century AD. The note-book consists of nine leaves, including those serving as covers, and is fastened together with leather laces. The notes are written in Greek longhand and shorthand, some of the latter evidently for practice. (British Library; Department of Manuscripts; Add. 33270)*





16 A copper plate forming part of the so-called Velvikudi grant found at Madakulam, southern India; dated 769/70 AD. The grant is written partly in Sanskrit in the Grantha script (top lines), and partly in Tamil using Vatteluttu characters. (British Library; Oriental Collections; Ind. Ch. 4)

17th-century Europe; in India the title deeds of land grants engraved in metal (fig. 16) were first drawn up in draft form on palm leaves or perhaps bark. We know almost nothing about the structural and external development of the Egyptian hieroglyphics before we meet them, perfectly shaped, engraved on stone. Was Egyptian writing an independent development or a side branch of the (Sumerian) pictographic script of Mesopotamia? How exactly did the 3rd-century BC Indian Brahmi script evolve from its supposed Semitic prototype? What were the intermediary stages of this development? For that matter, how did the Semitic consonant script, using only twenty-two signs, abstract itself from the various highly complex systems of writing which prevailed in the Middle East between 3000 and 1000 BC?

Writing material is not neutral; it can shape and influence the development of scripts in matters of general appearance, the way individual signs are formed, and also as far as the direction of writing is concerned. It also frequently exercises a quite decisive influence on the shape of the 'book' (palm leaves used predominantly in South and Southeast Asia dictate an oblong shape, for example). Moreover, once a particular convention has been established it will often remain, even progress further in the same direction, long after it has been replaced by an entirely different type of material (the oblong shape of paper manuscripts or copper plates in India etc.). The material also predetermines to a large extent the instruments necessary for writing, and *vice versa*. The stone-cutter needs different tools and his tools create shapes different from those made by pen or brush on the soft surface of paper or papyrus. The connection between information storage and technology is not a 20th-century invention. It existed when Sumerian scribes took advantage of the fact that wet clay was particularly well suited to receive and retain individual wedge-shaped impressions and in consequence changed the pictorial character of their script signs (the previous theory that thin curved lines did not remain visible for long on wet clay has now been more or less discarded).

Types of writing material

Some writing materials suggest themselves since they can be used without, or with only a minimum amount of, preparation. Stone is perhaps the most obvious one. It is perfectly serviceable in its most natural state (the surface of rock or cave walls can be used for painting and engraving); or it can be fashioned into polished slabs. Stone has the added advantage of being very nearly indestructible (except by human hands), thus guaranteeing the permanence of the information recorded. This indestructibility has indeed made it throughout history the most favoured material for pronouncements issuing from the two central institutions of social, economic and political life: the Palace and the Temple — or, as we would call them today, the Church and the State. In Egypt and Mesopotamia, stone inscriptions in monumental form, on rough or prepared rock surfaces, on slabs, megaliths or buildings, date back to the 4th millennium BC. The ancient world, Asia from the Near East to China, Imperial Rome, and indeed all major civilizations right up to the immediate present have followed this example; we have only to think of the ceremonial unveiling of inscribed stone plaques to commemorate the opening of a bridge or building which are regularly reported by the media.

Equally accessible are leaves — which were no doubt used together with, and long before, stone. To paint or incise a figure or symbol on a dried leaf takes less technical skill than to engrave a carefully prepared piece of stone. Unfortunately leaves, especially untreated leaves, are also most easily perishable, and much that could help us to trace and understand the development of writing is therefore lost to us.

Other materials readily available and easy to use are wood, bones, bamboo, tortoiseshell and the bark of trees. Some of the earliest examples of Chinese writing appear on the so-called oracle bones from the Shang period (c. 1766–1122 BC, see fig. 17) which belong to the *jia gu wen*, the 'documents on tortoiseshell and animal bones'. Animal bones, especially those of larger species such as sheep, goats, camels or even horses, were used in many parts of Asia and Africa. Incised bones have survived from prehistoric Europe and from Central America where the Mayas (and others) made special use of them (fig. 18). The Arabs, well into the Middle Ages, considered bones a cheap and convenient form of material for the writing of documents, magical texts, even verses of the Koran. Indeed, according to some traditions the last will of the Prophet was taken down in this fashion.

Ivory from the tusks of elephants is a rare and therefore more expensive variation. It also requires a higher level of technical skill to write upon (especially if split into thin sheets as in Southeast Asia), and a society already conscious of status symbolized by the display of wealth. Ivory was used in Egypt and in the Middle East of Biblical times, but as far as the production of whole manuscripts is concerned it was mainly restricted to Southeast Asia.

A cheap and easy-to-use material, and one that was throughout history readily available in most, though not all, parts of the world, is wood (fig. 19). Egyptian inscriptions have been preserved on wooden statues and sarcophagi, the earliest surviving examples of a wooden writing-board coming from the Middle Kingdom (2134–1789 BC). Preparations for making it usable were minimal. Once boards or tablets had been shaped — a process that needs little technical skill — wood could be left in its natural state and the writing could be done with ink (or paint) either with a brush or pen. Alternatively the boards could be varnished, lacquered or polished to create a glossy, smooth surface. In some cases the script was incised with a sharp instrument, a stylus or a knife. Wood is still used in the form of blackboards by schoolteachers, and, until very recently, pupils too would write their exercises on small wooden boards, in both cases with white chalk on a blackened surface. Since the script can easily be erased with a cloth or a wet sponge, blackboards are highly



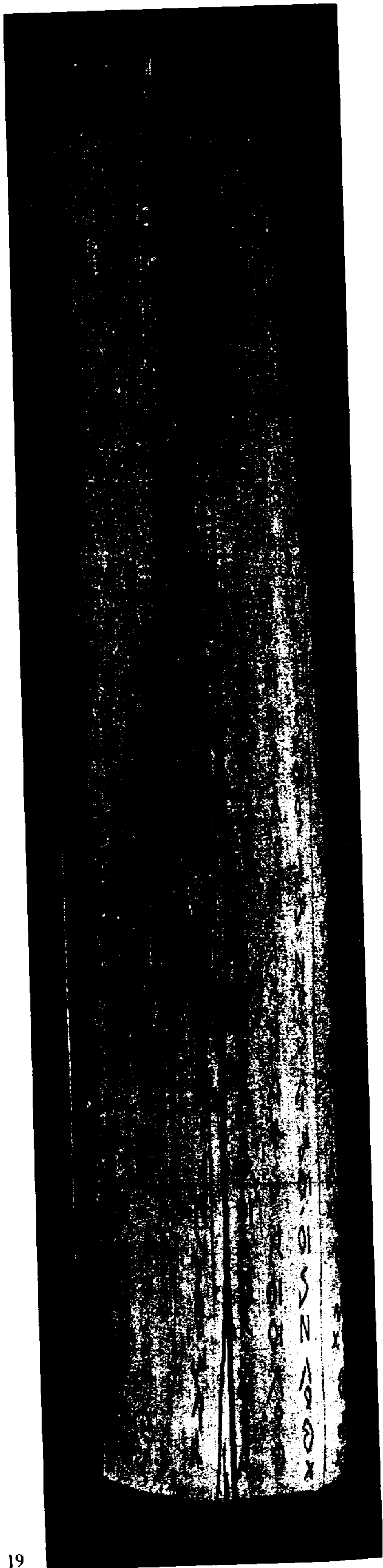
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economical, especially for the purpose of taking notes or writing out exercises. They can also be re-used almost indefinitely.

The Greeks and Romans used waxed writing tablets (see fig. 15) for taking notes, a habit they probably acquired from the Near East where such tablets, dating from the 8th century BC, have been found in the Assyrian city of Nimrud. Greek and Roman writing tablets consisted of thin rectangular boards with a slightly hollowed-out surface filled with black wax. They were used together with a metal stylus, pointed at one end (for writing) and flattened at the other (for erasing the script and smoothing the wax surface). A number of tablets laced together formed a book, or, as it was referred to, a *codex*.

Equally easy to handle but more dependent on availability were bamboo (fig. 20) and bark. Whereas bamboo and wood can be used in their natural state, bark needs a certain amount of processing to render it suitable for writing. The most sophisticated and accomplished use of bark comes from Central America. Maya and Aztec manuscripts (see p. 76) are made either of deerskin or of long sheets of *amatl* 'paper' manufactured from the fibre, roots and inner bark of the wild fig tree. Their surface is covered with a fine coat of white varnish which contrasts pleasingly with the text painted in a wide range of colours on both sides. The term 'paper' is of course strictly speaking a misnomer, but the finished product does indeed look very similar to paper and it is equally durable. Some Aztec manuscripts were made of coarser material derived from the fibre of the *agave americana*.

In the northern parts of India two varieties of bark enjoyed considerable popularity; the Himalayan birch tree (*betula utilis*) and the aloe (*aquilaria agallocha*). The earliest extant birch bark folios, cut, polished and oiled, are fragments of Buddhist works written at the beginning of the Christian era, but there is reason to believe that birch bark (sometimes in scroll format) was already in use at the time of Alexander's invasion (326 BC). In Kashmir birch bark manuscripts, the folios cut in *codex* form and bound between leather covers,

17 Chinese oracle bone from the Shang period; 1766–1122 BC. (British Library; Oriental Collections; Or. 7694/1554)

18 Carved bone from Monte Albán engraved with signs relating to ritual and calendric calculations; Mexico 700–1000 AD. (British Museum; Museum of Mankind; 1949. AM. 16–57)

19 Wooden slip inscribed with Chinese characters, from the Han period; 206 BC–220 AD. (British Library; Oriental Collections; Or. 8211. 449)

20 A 19th-century Batak manuscript from Sumatra. Four pieces of bamboo have been welded together to form a hollow cylinder. The writing has been incised with a sharp knife and then blackened to make it more legible. (British Library; Oriental Collections; Or. 5309)



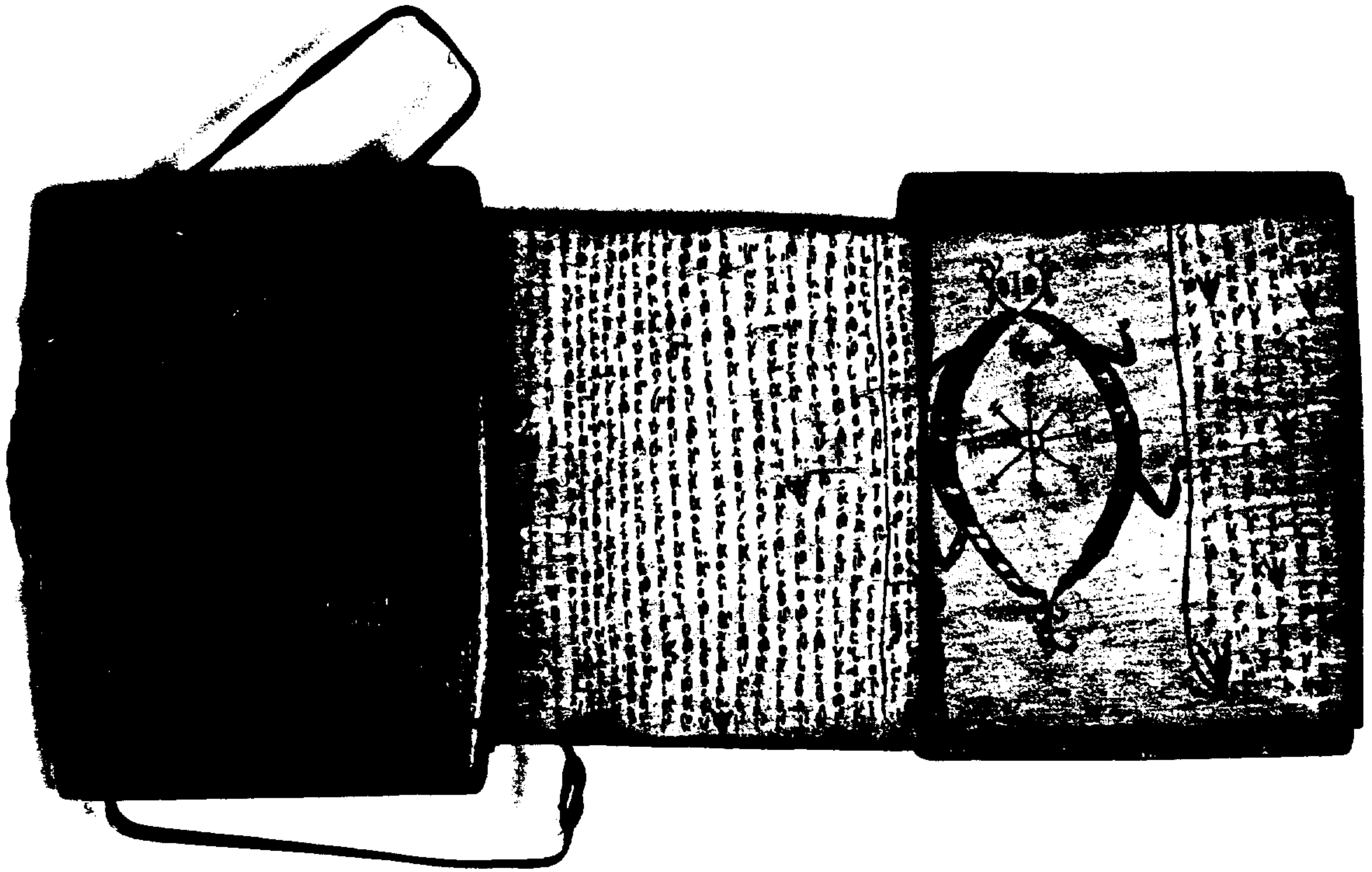
21 Birch bark manuscript of a ritual text written in Sanskrit; from Kashmir, 16th/17th century. (British Library; Oriental Collections; Or. 13300)

22 A book of invocations and divination as used by the Batak medicine men of Sumatra. The inner bark of trees has been fashioned into long strips, folded accordion-wise and put between protective wooden covers. (British Library; Oriental Collections; Add. 19379)

23 Chinese bronze vessel from the Western Zhou period (1050–771 BC). Inscriptions in sunken characters could be cast into bronze vessels by inserting a section in the mould on which the characters were shown in relief. (British Museum; Department of Oriental Antiquities; 1936-11-8-2 (11))

were still used in the 16th and 17th centuries (fig. 21). Birch bark can be rather fragile, and in the north-east of the sub-continent manuscripts made from the bark of the aloe were at times reinforced by woen boards to increase their durability. An interesting variety of bark manuscripts are the *pustahas*, the private notebooks of the Batak medicine-men which can still be found in Sumatra. Long sheets of thick, coarse bark are folded accordion-wise into squares and protected on both sides by strong wooden covers (fig. 22).

Many materials were primarily designed for a different purpose and for different use. These are silk, cotton, linen, metal, ostraca (pieces of broken pottery) and various utensils and objects such as swords, glass lamps, bronze vessels (fig. 23), furniture, fans etc. In terms of information storage, the status of metal, in particular that of bronze, is very similar to that of stone: both guaranteed permanence. The Roman laws are supposed to have been kept on the Capitol, inscribed in bronze. In India and Southeast Asia, where until very recently the main writing material was the highly perishable palm-leaf, important legal documents, especially entitlements to land, were usually engraved on specially fashioned copper plates (see fig. 16). Occasionally Jain, Buddhist and Hindu scriptures were accorded similar treatment.



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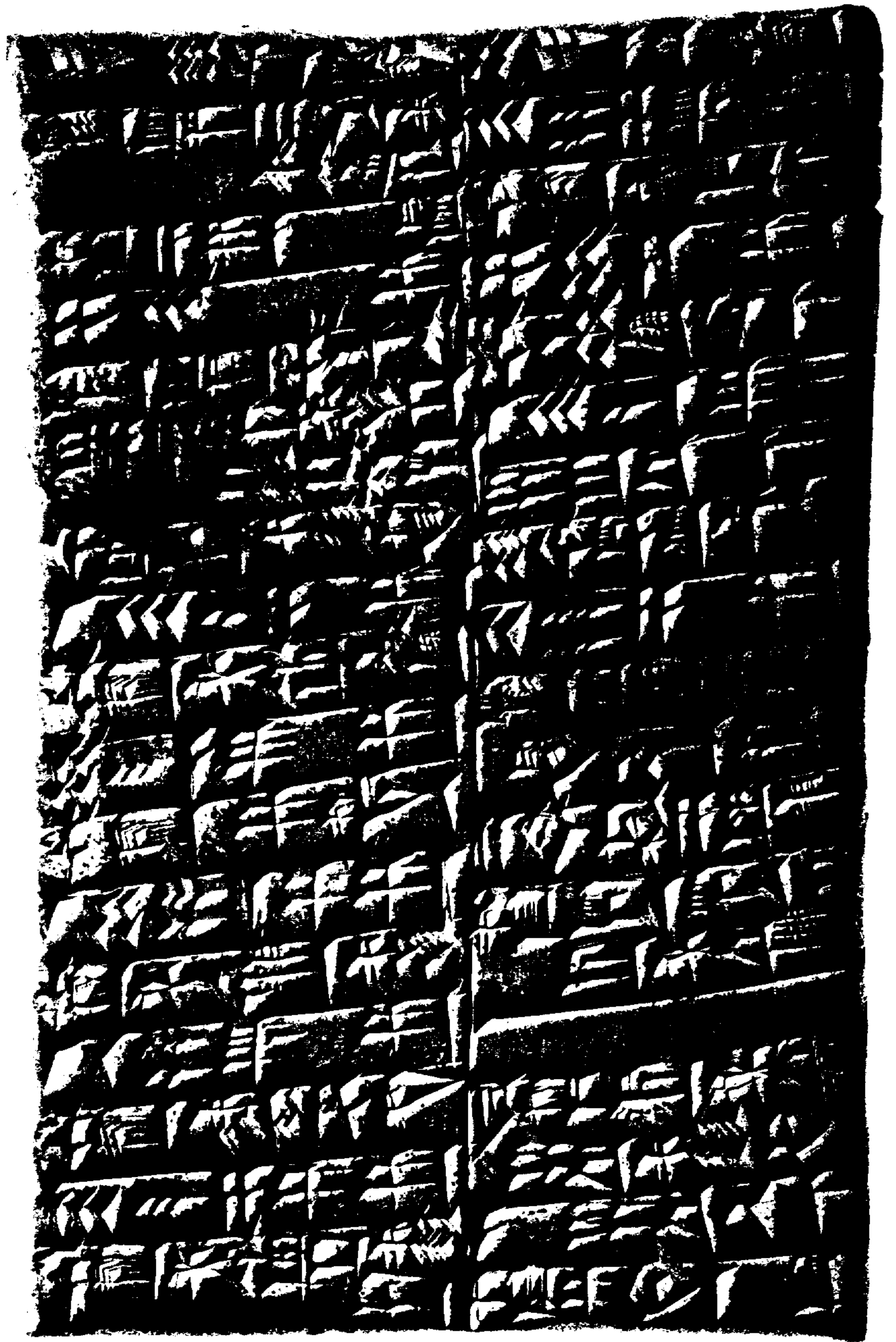
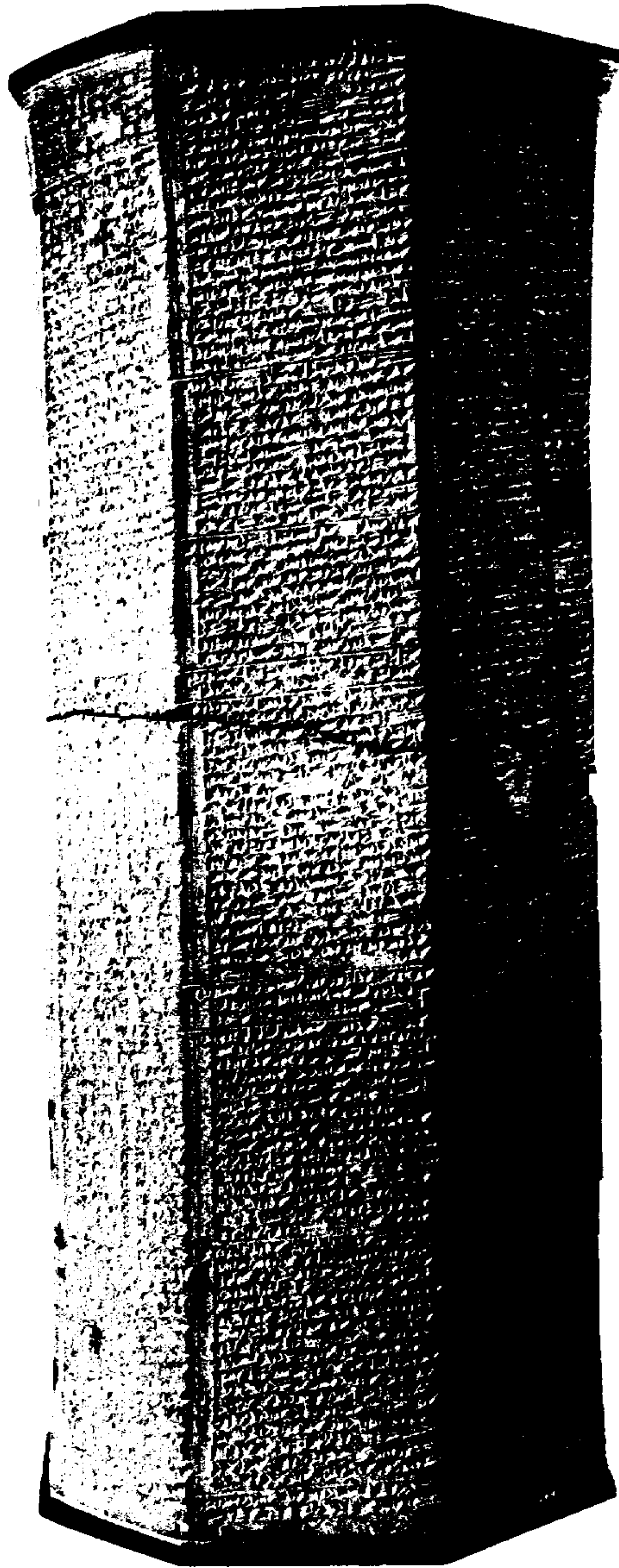
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Lead, a rather soft metal which could easily be beaten into thin sheets, inscribed, and then rolled up for storage, was fairly popular in the ancient world. Pliny and Pausanias both refer to lead sheets used for writing. Lead was also used by the Hittites; and the Mandaeans, a gnostic sect speaking an Aramaic dialect, used lead for inscribed amulets. Precious metals, gold and silver, were mostly employed to stress the value of a particular text, to show respect when sending a letter or message to a person of exceptionally high rank, or, last but not least, to draw attention to one's own wealth and social standing.

The use of textiles such as silk, cotton and linen is well documented. Silk, first cultured in China (supposedly at the time of the legendary Yellow Emperor c. 2640 BC) and for long a prized export article, is mentioned in a number of early 5th–4th century BC documents in a manner which implies frequent use. By the time of the Eastern Han (25–220 AD) silk was widely used for letters, literary compositions and official documents. It was however an expensive form of writing material, and already by the beginning of the Christian era a method had been developed which allowed old silk rags to be pulped, and the resulting mixture thinly spread on a frame to produce a paper-like material. Cotton, a product of India (cotton yarn was found on the site of Mohenjodaro) is frequently referred to in classical Indian literature. A firm yet flexible material (well suited for letters and drafts of documents), it was turned into writing material by being treated with wheat or rice paste, dried, and rubbed smooth with a cowrie shell or a stone (Plate IV). In Southeast Asia, pieces of cotton were sometimes cut into the oblong palm-leaf shape and stiffened with black lacquer, a slow and labour-intensive process during which the letters of the text were inlaid with mother-of-pearl. The third textile, linen, was much in evidence in Dynastic Egypt; mummy wrappings dating from the 6th Dynasty (c. 2345–2181 BC) have been found inscribed with passages from the Book of the Dead. Linen was also employed by the Copts and Arabs, and Livy (59 BC–17 AD) speaks of the *libri lintei* (linen books) used in contemporary Rome.

Finally there are the materials specially devised for the use of writing: clay, parchment, papyrus and paper. Clay tablets, the writing material of ancient Mesopotamia, though unassuming in appearance, were the first reliable form of writing material produced by artificial means. In addition, the script impressed on them represents the earliest systematic form of writing. Their invention — or better, the realization that bricks, sun-dried or baked in a kiln, could not only be used for building temples, palaces, houses or irrigation channels, but also for information storage — was no doubt inspired by necessity, for Mesopotamia is poor in wood and stone resources. Clay tablets have a long and distinguished history; they were in use for thousands of years, from about the middle of the 4th millennium BC until, eventually, papyrus and leather gained in prominence. The size of individual tablets varied: the most popular formats were the many-sided cylinder (fig. 24) and the oblong brick with convex sides (fig. 25). Because of their importance to the social and economic life of ancient Mesopotamia, clay tablets were stored in special libraries attached to temples and palaces, where they were foliated, indexed (according to the first sentence), cross-indexed (rather like a modern library record) and arranged on shelves in appropriate order.

Animal skins have been used since prehistoric times, first for shelter and clothing, later for information storage. Without undergoing curing (smoking) and processing (manipulation with oil) skin decays quickly, but once so treated it can be converted into one of the most durable and flexible of all writing materials. By a process of tanning (using tanning agents such as oak bark or acacia pods), which renders it non-putrescent and impervious to water, skin can be turned into leather. The earliest surviving leather documents come from ancient Egypt (c. 2500 BC), but leather was equally popular in western Asia, Persia, Iraq



24 An octagonal cylinder with inscriptions in Assyrian, recording the campaigns, hunting expeditions and building activities of Tiglathpileser I, king of Assyria (1114–1076 BC). In 1857, the Royal Asiatic Society used this text (then still unknown) to test the validity of the decipherment of the cuneiform script. (British Museum; Department of Western Asiatic Antiquities; 91003)

25 Account of barley issued as loans to workmen attached to various temples and as pay to other hired men. Dated the 47th year of Shulgi, king of Ur (2048 BC). The text is written in Sumerian, in the fully developed Neo-Sumerian cuneiform script. From Girsu (Tello), S. Iraq. (British Museum; Department of Western Asiatic Antiquities; 14318)

and later, Turkestan. Only one side of leather is truly suitable for writing, and in consequence the scroll format evolved.

Despite its many advantages, leather was however clearly inferior to papyrus, and attempts towards an improvement led to the discovery of parchment. Traditionally the credit for this invention is given to Eumenes II of Pergamum in Asia Minor (197–158 BC) — and the term parchment is derived from the name of the city of Pergamum. Parchment is the result of an already fairly complex manufacturing process: the whole skin has to be treated with lime, dehaired and defleshed, stretched, scraped on both sides, and treated with hot water, scraped again and rubbed with pumice, and then dried. Stretching is important; the thinner the parchment, the finer its quality. Recto and verso are clearly recognizable: the outer (hair) part is tougher, more yellow and in general better able to retain ink; the grain of the inner (flesh) part is smoother and easier to write on, but has a tendency to cause certain types of ink to flake. Fragments of parchment have survived from the 2nd century BC, but it was not before the 2nd century AD that it began to rival papyrus in the Roman world, and two more centuries passed before it was used for the best books. More or less simultaneously, the *codex* form began to replace the old scroll format, since it was no longer necessary to write on one side only. In Europe parchment remained the most popular writing material until well into the Middle Ages, when it was gradually supplanted by paper. The Arabs began to use paper in the 9th century but they still used parchment for copies of the Koran. Parchment was never used in India, Southeast Asia and the Far East. Hindus and Buddhists alike would have viewed with horror the idea of writing their sacred texts on the skin of slaughtered animals; and by the 2nd century AD the Chinese in any case had already invented paper.

Much has been written since the days of antiquity about the use and the production of papyrus (fig. 26). As an invention, papyrus seems to be as old as the hieroglyphic script, for an un-inscribed roll was found in the grave of a 1st Dynasty (c. 3100–2890 BC) noble at Saqqara. The earliest inscribed examples are fragments of temple account books from the 5th Dynasty (c. 2494–2345 BC). For over four thousand years, papyrus held a dominant position in Egypt and in the countries of the Mediterranean world. Though other materials were simultaneously in use, none was as serviceable, as pleasing and, even more important, none could be produced as readily in equal quantities. The production of papyrus was (like that of silk and paper in China) often a highly profitable state monopoly, first of Egypt and later of Rome and Byzantium. To manufacture papyrus, carefully-cut pieces from the inner stem of the plant, laid one on top of another on a special table, were pressed or beaten together and then dried in the sun. Some simple form of adhesive was no doubt necessary, perhaps some glue made of (Egyptian) flour, hot water and vinegar, or perhaps the properties of the muddy Nile water sufficed. At the beginning of the Christian era papyrus became increasingly scarce, and in consequence more expensive (the traditional Egyptian society and traditional Egyptian economy which had fostered its use and production were disintegrating) and the *codex* form, where both sides could be inscribed, began to take precedence over the scroll format.

According to Chinese records paper was invented by Cai Lun, a eunuch at the court of the Han Emperor Wu Di, in the year 105 AD. In actual fact Cai Lun seems to have been more of a supervisor than an inventor (he was charged with collecting information and reporting on various experiments in paper-making that were taking place in China) and the invention of paper was in all likelihood the outcome of an evolutionary process based to no small extent on the knowledge of making silk 'paper'. Cai Lun's paper had the advantage of being considerably cheaper than silk, having been made, according to contemporary records, from tree bark, fish-nets and old rags; botanists who have examined the earliest

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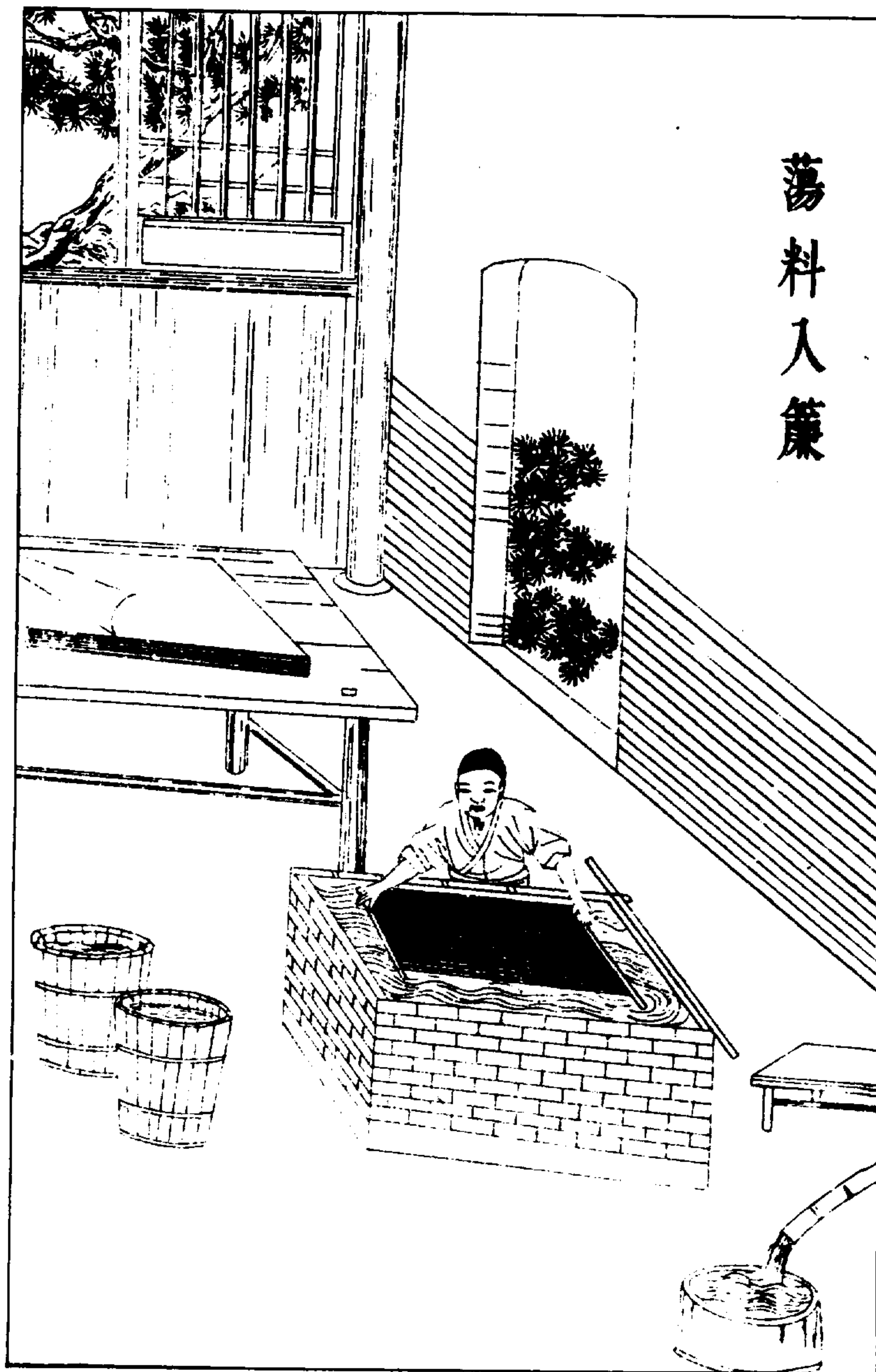
26 Folio from a Coptic Bible written in the Sa'idic dialect on papyrus showing the beginning of the Deuteronomy; from Upper Egypt, early 4th century AD. (British Library; Oriental Collections; Or. 7594, f. 53)

available (2nd century AD) paper fragments pronounce it a mixture of raw fibres (mulberry, laurel and Chinese grass) and rags.

One can reconstruct the earliest techniques of paper-making as follows: tree bark was cut into pieces and soaked in water for a considerable period of time (100 days). The pieces were then pounded in a mortar to separate the inner from the outer bark, which was then removed. The remaining pulp was mixed with either lime or soda ash, heated over a fire to boiling point for at least eight days and nights, and washed repeatedly until the fibres were completely softened. This mixture was then strained and pounded into a soft doughy substance, and bleached. The bleach was removed by further soaking and the mixture was placed in a large vat and some starch added to prevent the finished sheets from sticking together. To make sheets a frame was dipped into the vat, the sheet drained (fig. 27) and eventually lifted from the vat, and then well dried on heated wood or brick walls (DC, p. 19).

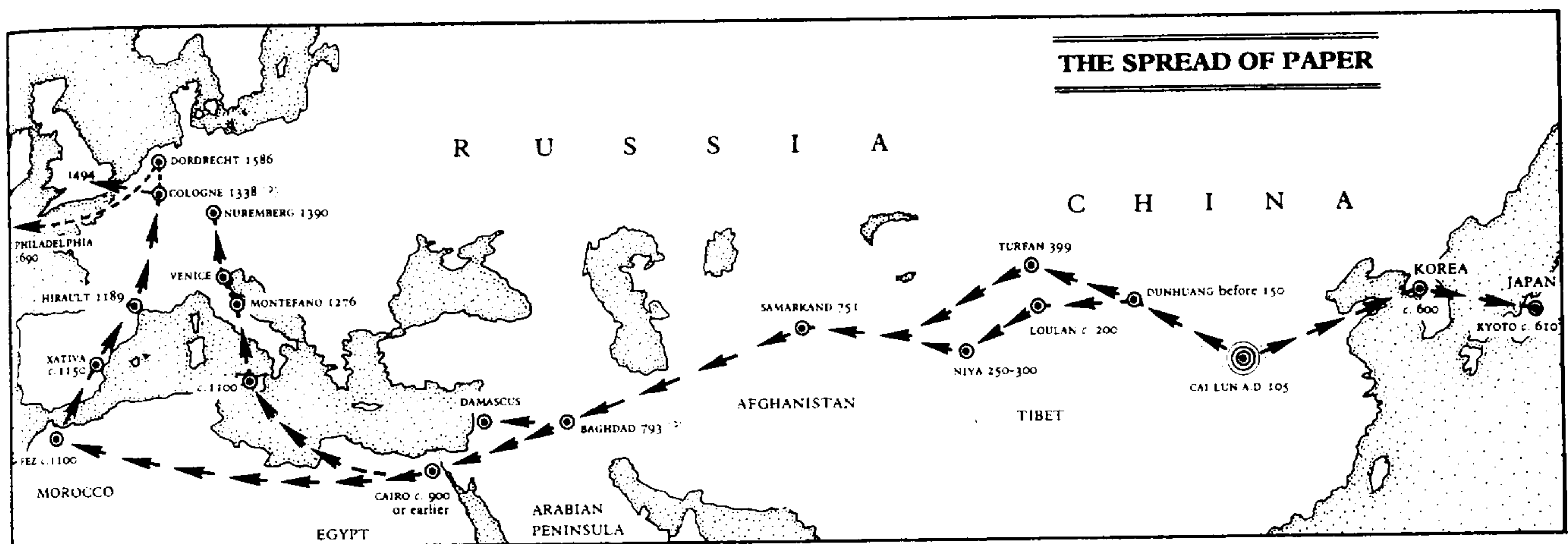
Paper reached Europe a thousand years after its invention by a tortuous and not always easily verifiable route. Originally the manufacturing process had been a closely guarded

state monopoly and during the first 600 years the technique of paper-making was known only in China, from where it did not spread much farther west than Chinese Turkestan. In 751 AD the Muslim governor of Samarkand took captive a large number of Chinese prisoners, some of them adept in the art of paper-making. According to one version those men voluntarily set up paper-making shops in Samarkand; another version claims that they betrayed their secret only under torture. For the next hundred years or so Samarkand paper (which used linen rags instead of mulberry bark) was as highly priced an export article as Chinese paper, but the social and religious structure of Islam is averse to localized exclusiveness and soon paper was being made in the Middle East; Baghdad, Damascus, Tiberius, Hamah, Tripoli and later Cairo became important manufacturing centres. In the 12th century the Arabs introduced paper to Spain and Sicily, and a century later to India. Rags remained the most important ingredient; in the laws of Alfonso X of Spain (1236 AD)



27 Paper making. The frame is dipped into the vat to drain individual sheets. Peking 1929; a reproduction of a 17th-century edition. (British Library; Oriental Collections; 15258. cc. 13 (vol. 1))

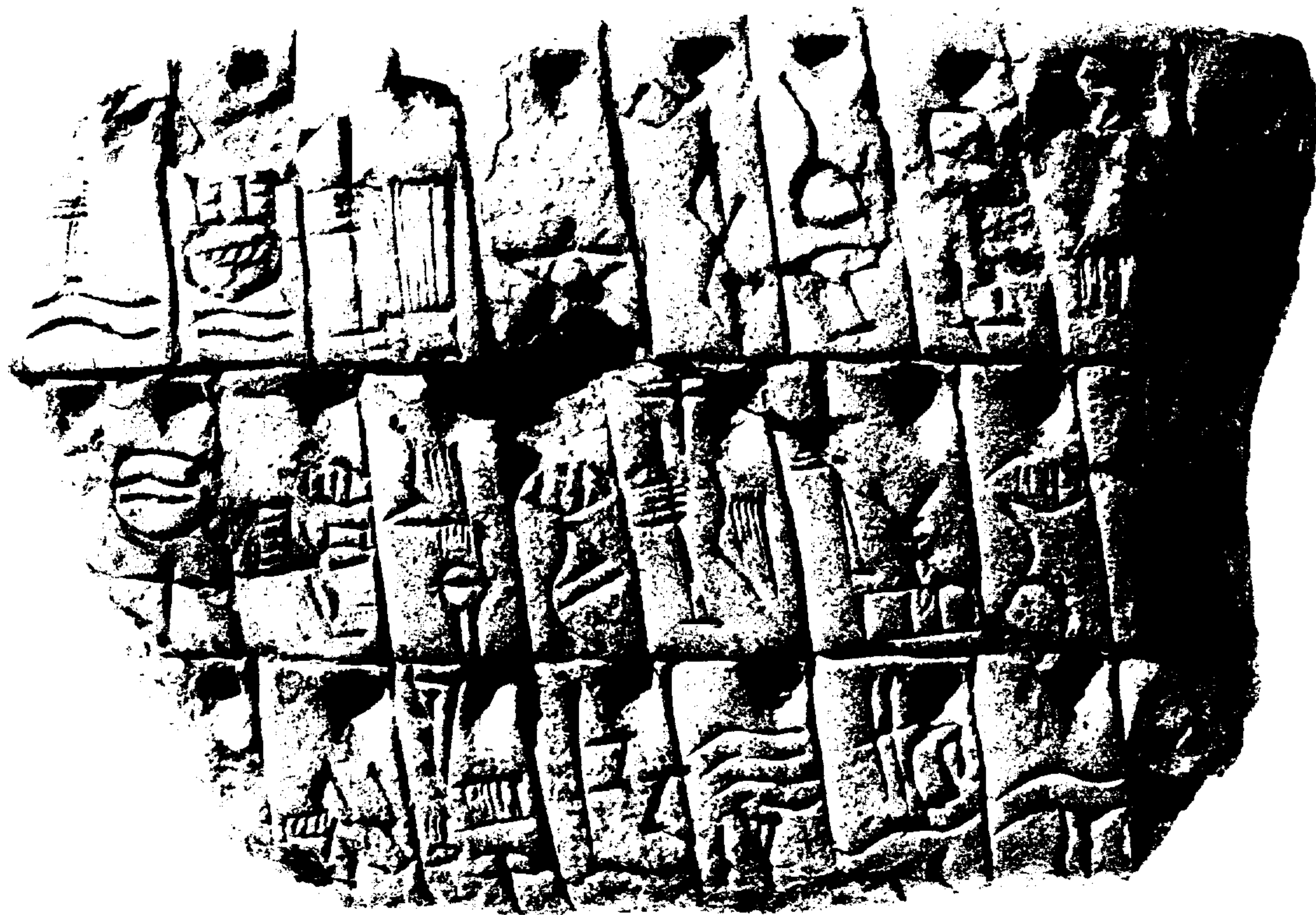
paper is referred to, rather fittingly, as *pagamino de paño* (cloth parchment). In 1492 the Muslims lost Spain and the art of paper-making passed into the hands of less skilled Christian craftsmen. Almost immediately the quality of paper declined. During the following centuries paper established itself firmly in the Western world. In 1338 a paper-producing factory was established in France (Troyes); in 1390 paper-making reached Germany (Nuremberg), in 1498 Austria (Wiener-Neustadt) and in 1690 America (Germantown near Philadelphia). Until the 19th century the manufacturing process remained basically the same; then, for economic reasons (the spread of general education caused an increase in demand), wood was introduced as a substitute for rags. This guaranteed supplies of paper but irrevocably diminished its quality, durability and appearance.



frame is dipped
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The influence of paper on western civilization has been enormous. The quick spread of printing, the popularization of education, our whole industrial society depending on administration not only at government but also at office level, is in retrospect unthinkable without easy access to almost unlimited quantities of cheap paper. By the beginning of the 20th century nobody would have been in any doubt that paper was here to stay, that it was the most important, efficient and totally irreplaceable medium of modern information storage. Economically and intellectually our society had become a paper society. But this faith has already been badly shaken. Computers, the quick advance of information technology, television, the varied uses of video displays, microfilm, microfiche, electronic information storage, have during the last decade heralded the advance of a totally different approach, a complete revolution in the field of information storage as far as methods as well as media are concerned. The supremacy of paper has been irrevocably challenged. Even if the electronic library, the paperless office and the bookless society have not yet arrived, the position of 'writing' material has changed fundamentally.

From the point of information storage, and from the point of material used for information storage, we can distinguish three distinct stages: oral traditions, where information is stored in memory to remain available in unaltered form; writing, where information is stored independently of the human mind to be retrieved and manipulated; and information technology, where the 'material' on which the information is stored manipulates the information for the user and by so doing creates additional, new information (see p.208).

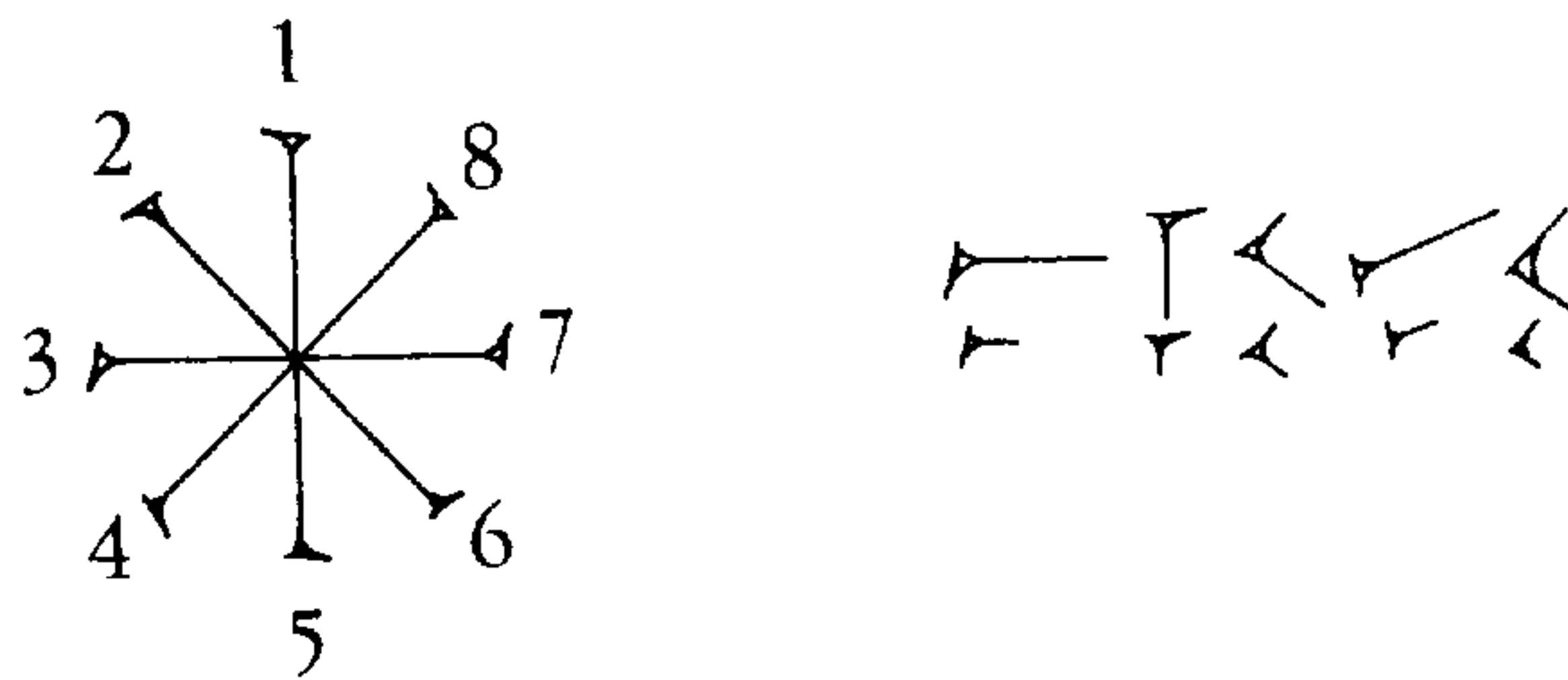


28 Inscribed clay tablet of the Late Proto-literate (Uruk IV) period, c. 3000 BC. Probably a list of names. At this early stage in the development of cuneiform writing, many of the signs are still drawings of everyday objects. Some have acquired a separate phonetic use, and this use indicates that the language of the scribes was Sumerian. The deep circular impressions represent numerals. Probably from Jemdet Nasr, near Kish, S. Iraq. (British Museum; Department of Western Asiatic Antiquities; 116625 (1924-5-21-1))

The development of forms of writing

Some materials have decisively influenced the development of certain forms of writing. To begin with, the Sumerian script seems to have been largely pictographic. The material and the implements most commonly used in ancient Mesopotamia were clay and the reed stylus. Wet clay, it has been argued, is not particularly well suited to retaining soft lines, circles and curves (neither, incidentally, are stone, wood and bones). Originally, two different types of stylus seem to have been used: one with a sharp point, for incising the line pictures, the other ending in a flat round point for writing the numerals (fig. 28). By holding the 'numeral' stylus in a certain way, a mark closely akin to a wedge-shaped impression can be made, and it may well have been from this point that the later triangular (or half oval) pointed stylus developed. It is not absolutely clear whether the cuneiform style (from *cuneus*—'wedge'), where each sign consists of a number of unconnected strokes or impressions, developed solely because of the opportunity created by the writing material used, or whether it was simply a stylistic development, fostered, in part, by a desire for greater speed. In all likelihood more than one element contributed to the change.

Theoretically, wedges could be impressed in eight different directions. For practical reasons, however, 5, 6, 7 and 8 were seldom used, and were soon altogether abandoned. 1, 2, 3 and 4 eventually remained the only wedges in use, 4 being relatively rare. By slightly altering the position of the stylus, the wedges could be made shorter or longer, while two more wedges could be obtained by changing the position of the stylus still further. Thus the Mesopotamian scribes had at their disposal the following double row of wedges with which to fashion the whole range of the cuneiform script:



The cuneiform script (see p.65) is written from left to right, but there are reasons to believe that it was originally written from top to bottom, in columns running from right to left. For practical reasons a rectangular tablet has to be held differently (with the fingers instead of in the hollow of the hand) from the way the earlier (square) tablets were held. At first the rectangular tablets were turned 90° to the left for the purpose of writing only, but eventually the new position was used for both reading and writing (AS, p.242) and in consequence the top-to-bottom columns became left-to-right top-to-bottom lines:

The evolution of the cuneiform script

| PICTOGRAMS | | | 'CLASSICAL' SUMERIAN | | OLD- AKKADIAN | OLD- ASSYRIAN | OLD- BABYLONIAN | NEO- ASSYRIAN | NEO- BABYLONIAN | Picture | Meaning |
|-----------------|---------------------------------|--------------------------|----------------------|-----------|------------------|------------------|--------------------|------------------|--------------------|----------------------------|-----------------------------------|
| URUK UPRIGHT | c 3100 BC TURNED 90° TO LEFT | JEMDET NASR c 2800 BC | c 2400 BC | | c 2200 BC | c 1900 BC | c 1700 BC | c 700 BC | c 600 BC | | |
| | | | LINEAR | CUNEIFORM | | | | | | | |
| | | | | | | | | | | NECK + HEAD | HEAD FRONT |
| | | | | | | | | | | NECK+HEAD + BEARD OR TEETH | MOUTH NOSE TOOTH VOICE SPEAK WORD |
| | | | | | | | | | | SHROUDED BODY (?) | MAN |
| | | | | | | | | | | SITTING BIRD | BIRD |
| | | | | | | | | | | BULL'S HEAD | OX |
| | | | | | | | | | | STAR | SKY HEAVEN-GOD GOD |
| | | | | | | | | | | STREAM OF WATER | WATER SEED FATHER SON |
| | | | | | | | | | | LAND-PLOT + TREES | ORCHARD GREENERY TO GROW TO WRITE |

According to available evidence the new direction of writing began to establish itself firmly from about 3200 BC onwards as far as clay tablets are concerned. Monumental inscriptions however continued to be written in vertical columns.

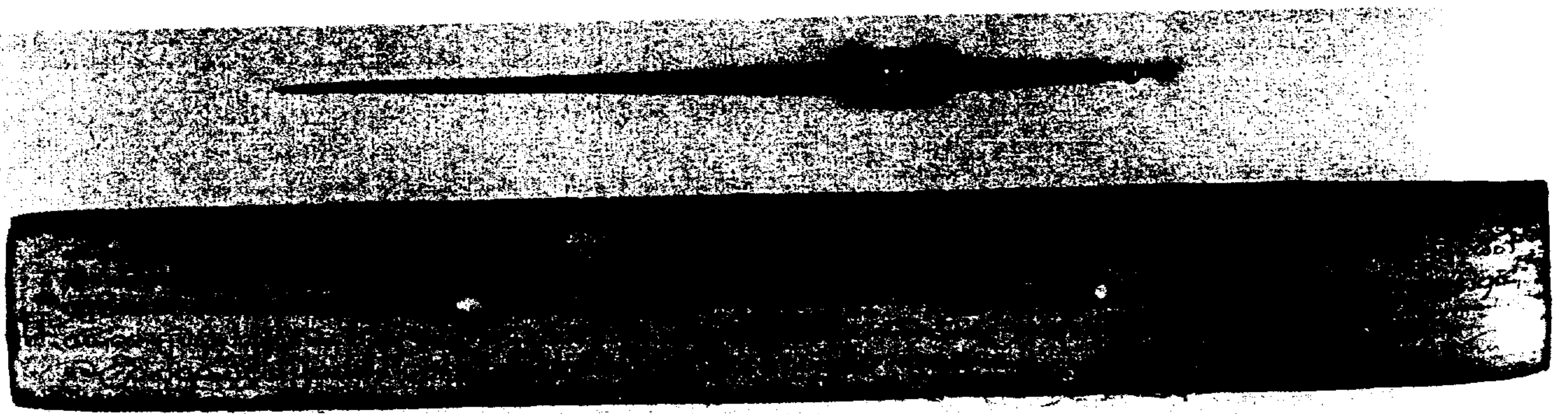
The theory has been put forward that the shape of bamboo canes, one of the most widely used writing materials of ancient China, determined the vertical direction of the Chinese script. Wooden slips (see fig. 19), often with notches on one or both ends for binding them together, may in fact have been imitations of the earlier bamboo models, a change made necessary when Chinese administration moved to areas where bamboo was less readily available. The perishable nature of bamboo makes such assumptions difficult to prove, but there are certain indications which point in this direction: the pictogram for 'state archive' (*ce*) for example, authenticated at least from the 14th century BC, seems to portray narrow bamboo slips laced together.

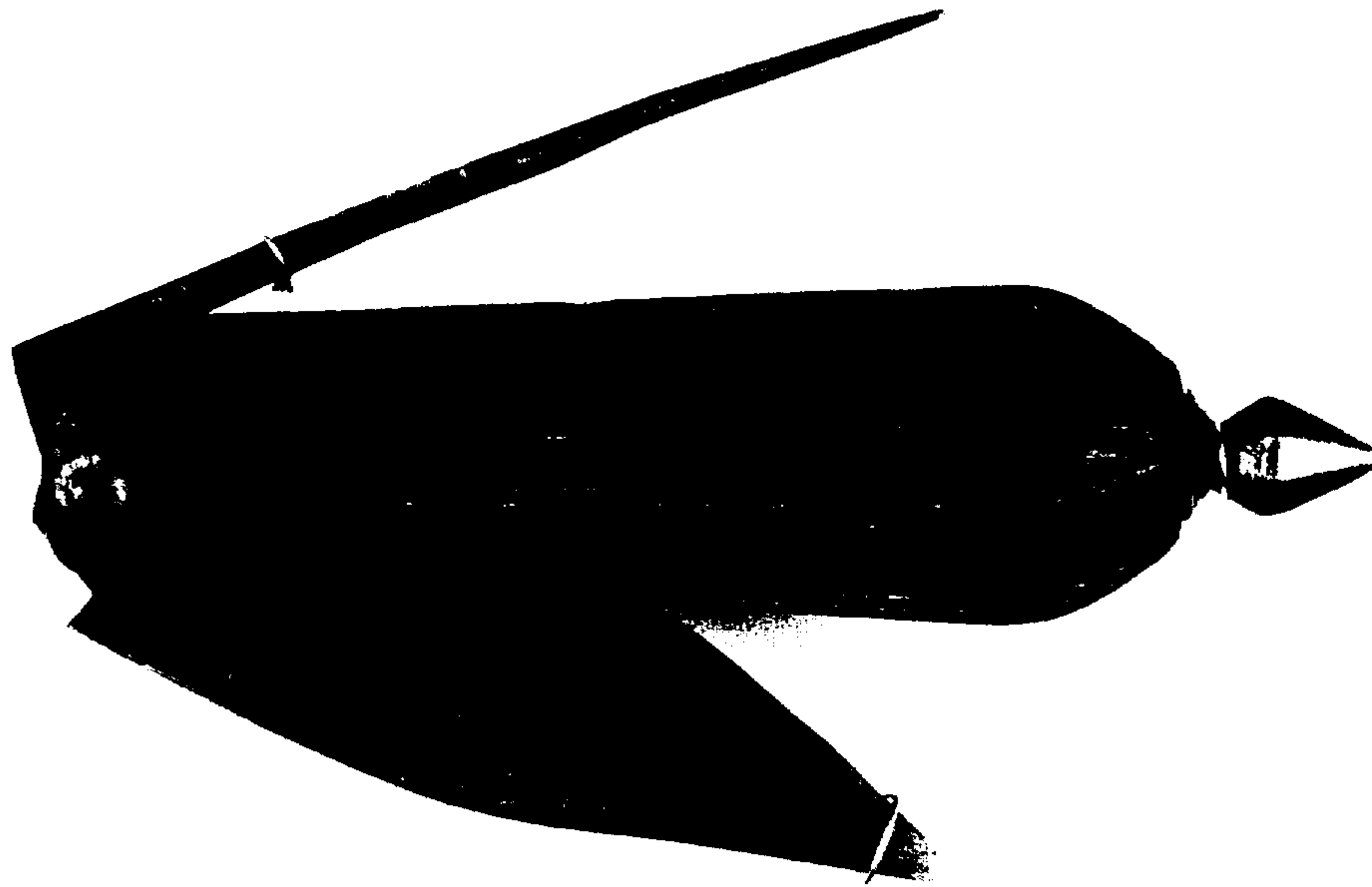
A material which had a decisive influence on the shape of characters and the development of a large number of scripts in India and Southeast Asia is the palm-leaf. As writing material it was probably used from very early times (tradition claims that Buddhists and Jains committed their Scriptures to palm-leaf, wood and bamboo slips in the 6th century BC), but, being highly perishable by nature, no definite examples seem to have survived prior to some 2nd-century (AD) fragments found in central Asia and Japan. In India few palm-leaf manuscripts pre-date the 16th century, but the characteristic oblong shape of the palm-leaf appears in a number of other writing materials, such as metal (fig. 16), paper (Plate III) or bark (fig. 69).

Palm trees which produced leaves suitable for writing were the talipot palm (*corypha umbraculifera*), the palmyra palm (*borassus flabellifer*) and, especially in Southeast Asia, the lontar palm (*corypha utan*). Palm-leaves are usually broader in the middle, gently tapering off toward the ends. To make them suitable for writing a simple process is necessary; each leaf has to be separated from the central rib, cut to size, boiled and dried, usually several times, and finally rubbed with a stone or cowrie shell to create a smooth surface.

Indian scripts (see p. 106) are generally thought to have developed from a 3rd-century BC prototype called Brahmi. This script produced, at one point, a variation characterized by a pronounced wedge at the top of each character (see p. 111). In the case of north Indian scripts this wedge developed eventually into one long horizontal stroke connecting all characters of a word or even a whole line. No problems arose in the north of India where the scribes used ink and pen (Plate III), but in the south and south-east of the sub-continent a method developed by which the characters were incised with a sharp metal stylus (fig. 29).

29 A palm-leaf inscribed in Sinhalese script; and a metal stylus. (British Library; Oriental Collections; Or. 6600 (72))



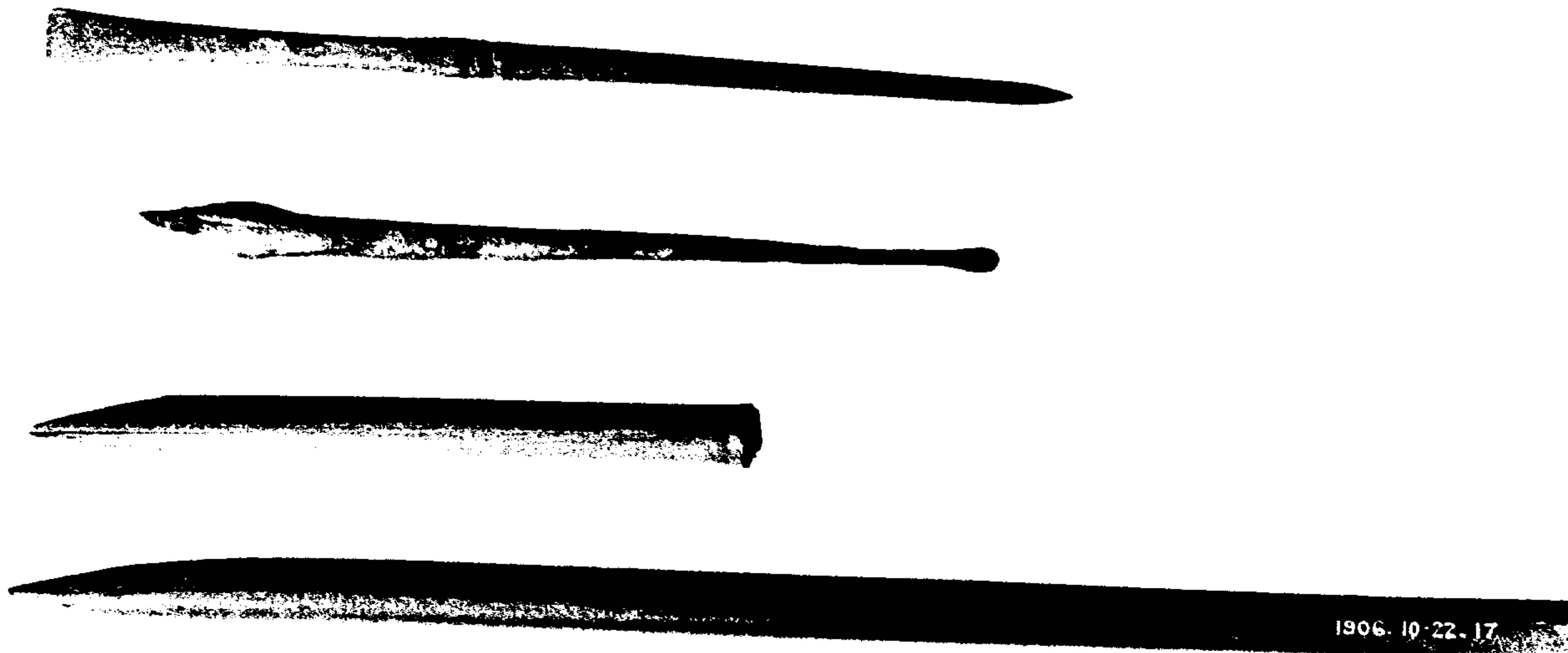


30 Knife and stylus from India. By courtesy of Mr Michael O'Keefe

Long horizontal strokes, following exactly the lines of the palm-leaf fibre, could easily have split the palm-leaf lengthwise and destroyed it. In consequence South Indian scripts began to take on a more and more rounded shape, with no interconnecting lines between individual characters. When the South Indian form of writing was brought to Southeast Asia in the course of the first millennium AD (see p.114) this element seems to have persisted, despite the fact that the materials used (gold, silver, paper, bark, bamboo, lacquered cloth etc.) no longer warranted such precautions.

Writing implements and writing materials are closely interconnected. To engrave characters, the stone cutter needs tools different from those the scribe uses on the soft surface of paper, leather or papyrus. Pen and brush have usually encouraged more cursive hands; stone, metal and other imperishable materials tend to favour monumental styles. Writing implements have also influenced and guided the development of certain calligraphic styles, as will be discussed later (see p.165).

Broadly speaking, the actual process of writing can be executed in two distinctly different ways. The script can either be scratched into the surface of the material with a sharp instrument, such as a stylus, knife, or stone cutter's tool (figs. 29, 30), or it can be applied onto the surface with a pen (quill, reed, wood or metal) (fig. 31) or a brush, using ink, paint or lacquer. The process of transfer, when a rubbing is taken from a stone or metal inscriptions (see p.195), represents an intermediate stage which, taken to its logical conclusion, leads to printing (see p.194). It is certainly no accident that in many languages the word used for 'writing' is in some way derived from verbs meaning 'to paint', 'to cut', 'to incise' or 'to scratch'. Ink has been used since antiquity and a variety of recipes for its preparation have been handed down to us. Most of them have lamp black as a basic constituent, combined (according to the effect desired) with resin, gum, honey, borax, burnt almonds or cow's urine, and — in the case of coloured inks — a colouring agent (sometimes gold or silver).



31 *Two Roman bronze pens; a reed pen with a split nib from Egypt, Roman period; a stylus for incising letters into waxed tablets, with a flat end for erasing. (British Museum; Department of Greek and Roman Antiquities: GR 1900.6-11.4; GR 1968.2-12-1; GR 1906.10-22.18; GR 1893.11-2.1)*

Writing directions and word divisions

Anybody brought up within the confines of western civilization might be tempted to regard the direction of writing which runs from left to right, and where the lines follow each other from the top to the bottom of the page, as the most logical and normal one. However, one soon discovers that there are a large number of scripts (Hebrew and Arabic, for example) where this 'natural' order seems to be reversed and where the writing runs from right to left with the lines still following each other from the top of the page to the bottom, but where the book (or manuscript) is actually read from what to us may seem back-to-front. A person with a more inquisitive mind will eventually realize that Chinese and Japanese are written in vertical columns from top to bottom, but after this may feel that the range of possibilities as far as directions of writing are concerned has been exhausted.

Nothing could be further from the truth. To begin with, our left-to-right direction is by no means so self-evident and universal as we might think. It is in fact a rather late development; even the alphabet was, to begin with, written the other way round, namely from right to left. In addition, there exist a large number of possibilities which have been used by different civilizations at different times. Sometimes these have been governed by the type of materials used for writing, but often there is no other reason than the fact that what is regarded as normal and logical differs considerably from place to place and from civilization to civilization.

The following directions of writing have been used:

(1) From left to right with the lines following each other from top to bottom; in fact the way our own alphabet is written —

ABCDEF G
HIJKLMN

(2) From left to right but with the lines following each other from bottom to top —

HIJKLMN
ABCDEF G

(3) From right to left, with the lines following each other from top to bottom (the common direction of all Semitic scripts) —

GFEDCBA
NMLKJIH

(4) From right to left with the rows following each other in an upward direction —

NMLKJIH
GFEDCBA

(5) Boustrophedon, or 'the way an ox-drawn plough moves'; a popular and widely used writing direction of antiquity —

GFEDCBA ABCDEF G
HIJKLMN *or* NMLKJIH

(6) In a circle, in either direction —

| | | | | | | |
|---|---|---|--|---|---|---|
| G | A | B | | B | A | G |
| F | | C | | C | | F |
| E | D | | | D | E | |

(7) In a spiral, again in either direction —

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | F | G | H | | F | G | A |
| E | | A | | I | J | | H |
| | D | C | B | | I | J | B |
| | | | | | D | | C |

(8) From top to bottom in vertical columns, with the columns following each other from right to left —

| | |
|---|---|
| H | A |
| I | B |
| J | C |
| K | D |
| L | E |
| M | F |
| N | G |

(9) In vertical columns following each other from left to right —

| | |
|---|---|
| A | H |
| B | I |
| C | J |
| D | K |
| E | L |
| F | M |
| G | N |

(10) In vertical columns following each other from right to left, or left to right, but with the direction of reading in each column running upwards —

| | | | | |
|---|---|-----------|---|---|
| G | N | | N | G |
| F | M | | M | F |
| E | L | | L | E |
| D | K | <i>or</i> | K | D |
| C | J | | J | C |
| B | I | | I | B |
| A | H | | H | A |

(11) A further possibility is to have vertical columns, either read upwards or downwards, but with the columns following the boustrophedon mode —

| | | | | | | | | |
|---|---|---|---|-----------|---|---|---|---|
| P | I | H | A | | A | H | I | P |
| O | J | G | B | | B | G | J | O |
| N | K | F | C | <i>or</i> | C | F | K | N |
| M | L | E | D | | D | E | L | M |

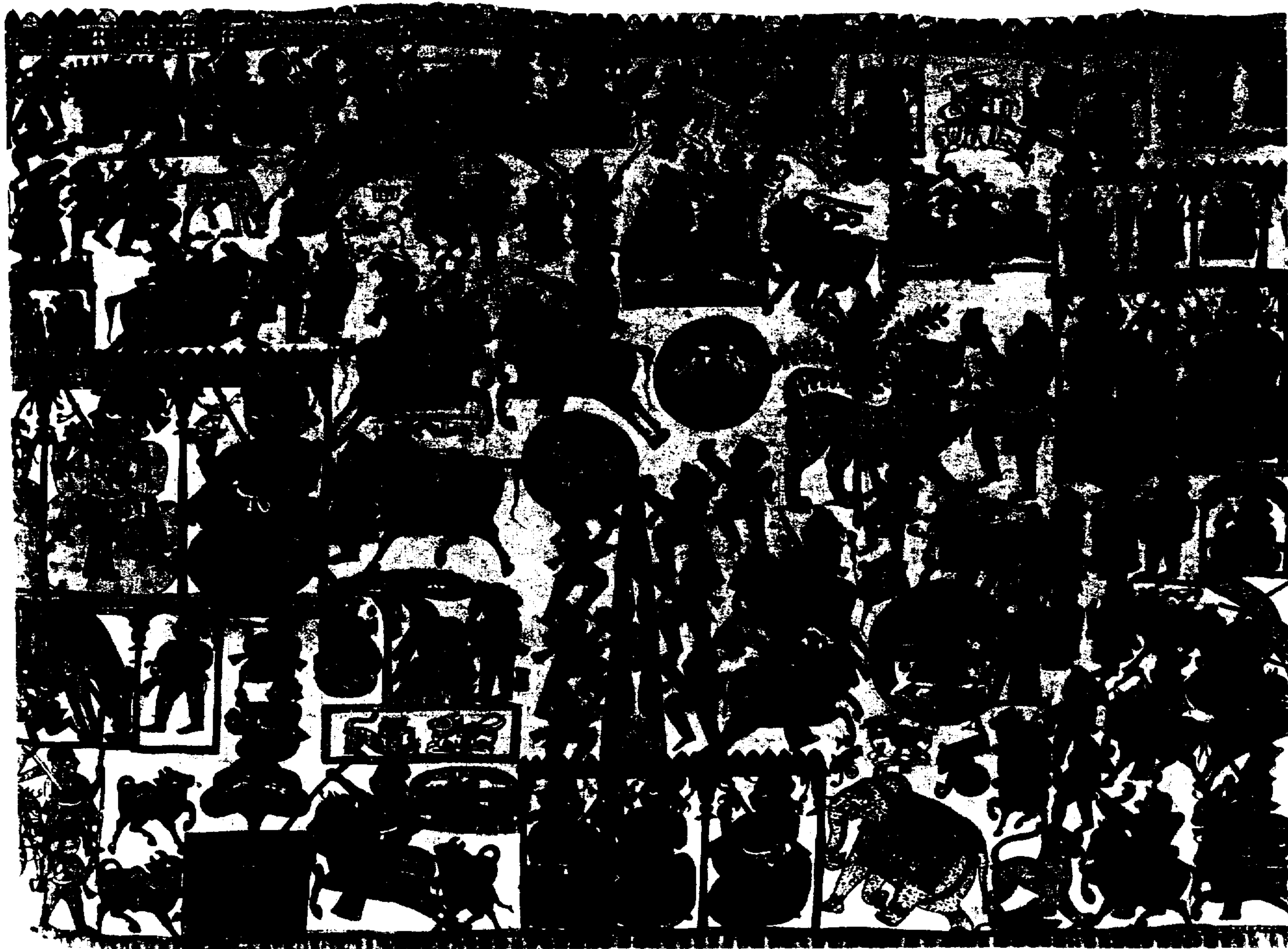
(12) 'Shark-toothed', which means that the writing material has to be turned upside down after completing a line—

| | | | | | | |
|---|---|---|---|---|---|---|
| N | W | T | X | I | H | |
| A | B | C | D | E | F | G |

(13) Sometimes, as in the use of the Maya glyphs, the script may be arranged in pairs of vertical columns (JEST, p.26) —

| | | | | |
|---|---|--|---|---|
| A | B | | I | J |
| C | D | | K | L |
| E | F | | M | N |
| G | H | | O | P |

(14) Finally there is the meandering form of writing direction. A good example is to be found in the Aztec manuscripts (see p.9) where red lines indicate the place where the next group of symbols has to be read. Somewhat similar elements manifest themselves in the painted screens which the professional story-tellers of Rajasthan



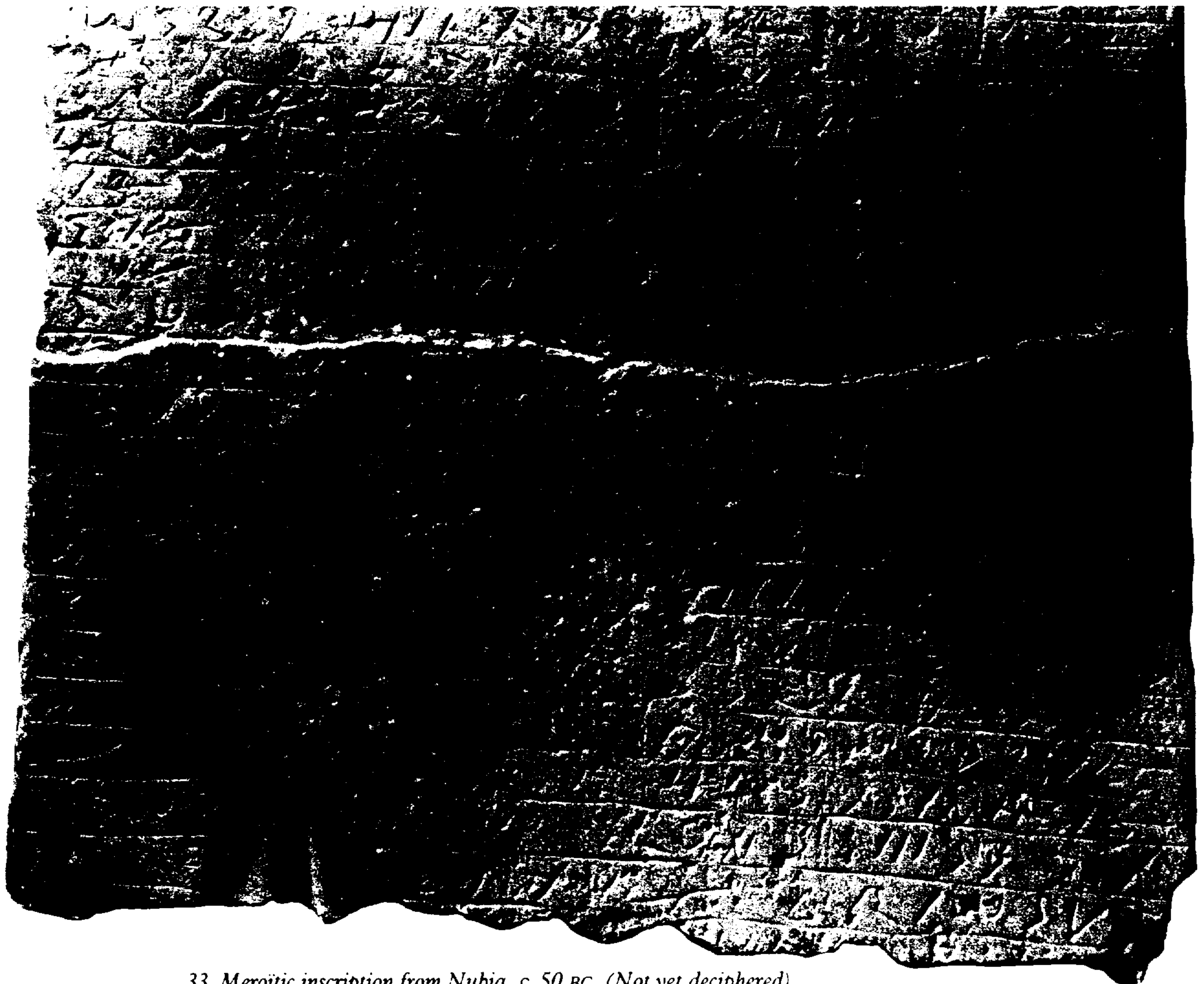
32 Section of painted cotton cloth (125 × 72 cm.) depicting the exploits of Bagrawat, a celebrated tiger killer. Marwar, 1933 AD. (Victoria and Albert Museum; I:S.13-1968)

(India) carry from village to village (fig. 32). These screens are vividly painted with representations of the key scenes in the narrative, and only the story-teller knows the correct order in which the scenes follow each other, pointing them out while reciting his tale to the audience.

Connected with the direction of writing is the direction of individual signs — pictographs as well as letters. This too can vary. Egyptian hieroglyphic signs, for example, face mostly towards the beginning of the line, as do the majority of pictographic or pictorial forms of writing. Alphabetic signs look towards the end of the line. In cases where the direction of writing changes, the direction in which the individual signs look may change too. For example in early Greek documents where a boustrophedon direction of writing was used, the individual signs looked alternately in one or the other direction in the same inscription:

ABCDEF GH
 90NMJI

The division of words and sentences, which we take so much for granted, developed only gradually. The majority of ancient scripts — Egyptian, the cuneiform script of



33 Meroitic inscription from Nubia, c. 50 BC. (Not yet deciphered).
(British Museum; Department of Egyptian Antiquities; 1836)

Mesopotamia, the syllabic script of the Aegean, at times also some Indian scripts (especially the two classical languages of the sub-continent, Sanskrit and Tamil) — did not divide words and/or sentences. In those societies writing was done by specialists who were completely immersed in writing conventions and who could therefore dispense with such aids to legibility. This lack of word division is also a feature of early European manuscripts, no doubt for similar reasons; the monastic scribes knew not only the intricacies of their script, but, since most manuscripts dealt with religious matters, they also knew the text. Word divisions, when they do occur — and they can occur quite early, as for example in the case of the Meroitic (fig. 33) or the Cypriote script (see p.70) — can take a variety of forms: one dot, two dots, three dots arranged in triangular form; one, two or three vertical strokes or an oblong stroke; or more ornamental variations of what was originally perhaps just a simple dot. The practice of joining letters together to form ligatures becomes noticeable quite early on and is mostly associated with handwriting and the use of perishable materials. In an elementary form ligatures are already a feature of the demotic script of ancient Egypt (see p.64).

Positions for writing

There is, finally, the actual position assumed for writing. This can vary considerably. We frequently come across representations of Egyptian scribes sitting cross-legged on the floor, the kilt stretched tightly across the knees to support the papyrus used for writing (fig. 34). Others are shown kneeling with one knee raised and the writing material placed upon it. Equally popular in the ancient world was the standing position (Plate V and fig. 35).

34 *Pes-Shu-Per, Chamberlain of the Divine Votress of Amun, Amenirdis, depicted as scribe.*
(British Museum; Department of Egyptian Antiquities; 1514)

35 *Details from a palace relief of Tiglathpileser III, king of Assyria (745–727 BC), showing two scribes registering the spoils from a city in Babylon.* (British Museum; Department of Western Asiatic Antiquities; 118882)



1514

There are variations to these postures. On the whole, Eastern scribes preferred to sit on the floor, or on a cushion (see fig. 94), with the writing material either in their lap or on a small table in front of them (see Plate III). In Japan and China calligraphers would kneel on the floor, the paper spread before them, holding the brush unsupported in the right hand. European scribes favoured table and chair. Medieval manuscripts depict them sitting on a chair or bench, the *codex* (or scroll) in their lap or on a small, usually steeply sloping, table in front of them (fig. 36). If a standing position was assumed, the manuscript was placed on a tall, often steeply sloping table.

36 Basic to the illustration of manuscripts of the gospels are representations of the four evangelists, often portrayed as scribes. St Mark is here shown dipping his quill pen into his inkhorn with one hand while in the other he holds a long-handled pen-knife; 11th-century manuscript from the Benedictine abbey of Les Pr aux in Normandy. (British Library; Department of Manuscripts; Add. 11850, ff.61b/61)



NICIUM
 EVANGELII
 IESU XPI
 FILII DEI SICUT
 SCRIPTUM EST IN
 ISAIA BROPHIA