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 Maslains, a gastric 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-porous 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.
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 uninscribed roll was found in the grave of a 1st Dynasty (c. 3100–2890 BC) noble at Saggara. 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 to the eye, 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 malleable 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 on 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

26. Folio from a Coptic Bible written in the Sahidic dialect on papyrus showing the beginning of the Deuteronomy; from Upper Egypt, early 4th century AD. (British Library, Oriental Collections; Or. 5594, f. 55)
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 whom were put to death in the art of paper-making. According to one version these 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, Tiberias, 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)

paper is referred to, rather fittingly, as papelino de patio (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 1388 a paper-producing factory was established in France (Troyes); in 1390 paper-making reached Germany (Nuremberg); in 1498 Austria (Wiener-Neustadt); and in 1698 America (Germanstown 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.

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).
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 commas—"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

<table>
<thead>
<tr>
<th>URU</th>
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<tbody>
<tr>
<td>PICTOGRAMS</td>
</tr>
<tr>
<td>1. Sumerian</td>
</tr>
<tr>
<td>3. Assyrian</td>
</tr>
<tr>
<td>5. Neo-Babylonian</td>
</tr>
<tr>
<td>7. Neo-Babylonian</td>
</tr>
<tr>
<td>11. Neo-Babylonian</td>
</tr>
</tbody>
</table>

The evolved signs for signs:

- Head
- Feet
- Body
- Sitting
- Bird
- Bulls
- Heat
- Star
- Water
- Fire
- Rain
- Moon
- Sun
- Earth

In all likelihood more than one element contributed to the change.
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’ (史) 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 Jainists 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 leaves which produced leaves suitable for writing were the talipot palm ( Corypha umbraculifera ), the palmyra palm ( Borsus flabellifer ) and, especially in Southeast Asia, the lontar palm ( Corypha utan ). Palm leaves are usually broader in the middle, gently tapering off towards 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 smooth a 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 eventually developed into a 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).

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 cursively handwritten; 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 inscription (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).
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 — ABCDEFG HIJKLMN

2. From left to right but with the lines following each other from bottom to top — HIJKLMN ABCDEFG

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

4. From right to left with the rows following each other in an upward direction — NMLKJIH GFECDBA

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

6. In a circle, in either direction —

   A  B  C  D  E
   G  F  E  D  C

7. In a spiral, again in either direction —

   A  B  C  D  E
   H  G  F  E  D

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

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

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

N   T   N   F   I
A   B   C   D   E

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

A   B
C   D
E   F
G   H
I   J

(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 x 72 cm.) depicting the exploits of Bāgarksat, a celebrated tiger killer. Marwar, 1933 A.D. (Victoria and Albert Museum: 15:13:1968)

(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:

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

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
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 papyri 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-her-Per, Chamberlain of the Divine Votaries of Amun, Amenirdis, depicted as scribe. (British Museum; Department of Egyptian Antiquities; 1514)

35 Details from a palace relief of Tiglath-pileser III, king of Assyria (745–727 bc.), showing two scribes recording the spoils from a city in Babylon. (British Museum; Department of Western Asiatic Antiquities; 118052)

Mesopotamia, the syllabic script of the Aegaeans, 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).
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 Preusse in Normandy. (British Library, Department of Manuscripts; Add. 11850, ff.61b/61).
Writing in the Fertile Crescent

For the purpose of this study the term 'Fertile Crescent' does not refer only to Mesopotamia — the arc of arable land stretching from Palestine through Syria to Mesopotamia — but also to Egypt and the Indus valley (now Pakistan). Sometime in the 3rd millennium BC, neolithic agriculture, which had been evolving slowly over the previous 2,000 years, took a revolutionary leap forward, resulting in changes as far-reaching and irreversible as those produced by the industrial and scientific revolutions of the 18th and 19th centuries. This new, improved type of agriculture, which depended largely on irrigation, not only supported a steadily increasing population but also an ever-growing number of non-producing specialists such as craftsmen, architects, administrators, priests, soldiers, artists and scribes. With specialization and population growth came the establishment of urban settlements alongside the banks of navigable rivers (Nile, Euphrates, Tigris and Indus), the exchange of surplus goods by trade which introduced a new concept of property, and a definite need for a centralized form of administration (religious, secular or both) to control, synchronize and if necessary protect the framework of what were becoming cooperative political units.

This new type of society, which derived its identity from the Palace and the Temple — institutions depending on each other and more often than not identical — soon outgrew the use of memory aids, property marks and pure ideograms, and made the decisive step from idea (thought) representation to language (sound) representation in order to record laws, contracts, edicts, histories, astronomical calculations and eventually also literary traditions. Nearly all writing as we have known it for the last 2,000 years, with the exception of Chinese and pre-Columbian scripts, originated in the Fertile Crescent during the latter part of the 3rd millennium BC; and, in the opinion of some scholars, in Mesopotamia itself. Thus Mesopotamia has often been referred to as the cradle of civilization and the place where literacy as such developed. This, however, does not mean that the Fertile Crescent was the only place where phonetic elements evolved. Such elements can be observed, not only in the writing conventions of people possessing a similar level of civilization, as for example the Aztecs of Central America (see p.76), but also in simple forms of idea transmission (such as memory aids) used by tribal societies (see p.2).

Egyptian scripts

Much has been written about the conservative character of the Egyptian people, who during the 3,000 years of their recorded history maintained almost the same way of life, based on barely changing social, economic, religious and political concepts. This conservatism did not lack dynamism, however, since it was largely based on observable natural phenomena.

For 3,000 years Egypt enjoyed an almost unparalleled level of secure prosperity. The Nile automatically revitalized the land with its yearly inundations. It was easily navigable,
We are fairly ignorant about the way hieroglyphic writing developed. Some scholars believe (10, p. 58, and others) that phonetic elements are already discernible in objects such as the palette of Narmer and the plaque of Aha or Akha (103, p. 58), both relating to the beginning of the First Dynasty.

To understand the complex, yet at the same time flexible and also logical, way the Egyptians manipulated their seven hundred or so hieroglyphic signs, an examination of the inner structure of the Egyptian writing will be useful. Pure pictography, or logography, where one sign equals one word, is exceedingly rare, partly because of the large number of signs this would necessitate, partly because of the way most languages are constructed. In the case of the Egyptian language the large number of purely formal words (prefixes, suffixes, etc.) is so different, for example, from Chinese — would have made such a solution even more difficult. But the Egyptian language had another characteristic which was fully exploited by the hieroglyphic script. It bore affinities to both the Semitic and the Hamitic group of languages; that is to say, its word structure, in common with other Semitic languages, depended predominantly on consonants. Basically, Egyptian writing consists of a mixture of ideography and phonography, idea and sound writing; but a more detailed breakdown of its internal structure leaves us with five different components—

1. The drawing of a particular object could stand for one particular word denoting this object.
2. A concrete visible action could be represented by its most characteristic elements.
3. A word, or better the two consonants (more rarely three) of a word, could be expressed by the picture of an object which contained the same consonants, in other words by means of a rebus (see p. 33). This allowed for a high degree of flexibility; for example, if we transfer this idea to the writing of English, the drawing of a sun disc meaning 'sun', and containing the consonants s-n could be used for writing sun, son, or in combination with other signs Sunday, naughty, singling, sung etc. Because of the consonant-dominated structure of the Egyptian language, a relatively small number of double consonant signs (c. eighty) was needed, but this advantage was partly lost again by the ambiguity such a script would create (even our English example indicates this).
4. In addition, the Egyptians had twenty-four single consonant signs which could quite adequately have been used to form the basis of a purely phonetic — that is, consonant — script, eliminating the need for all other conventions. Why the Egyptians failed, or perhaps better, refused, to take this step has been the subject of much discussion.
5. Finally, to eliminate ambiguities which arose in connection with the use of phonetic signs the Egyptians employed determinatives, sense signs which were added at the end of words to indicate the sphere to which a word belonged (to return to our English example, the sign of a man added to the sign of the sun disc representing s-n could only mean son).

1. $\overline{\text{j}}$ = leg
2. $\overline{\text{t}}$ = eye
3. $\overline{\text{h}}$ = to go
4. $\overline{\text{n}}$ = to weep
5. $\overline{\text{p}}$ = (house)
6. $\overline{\text{b}}$ = (basket)
7. $\overline{\text{h}}$ = (the month)
8. $\overline{\text{s}}$ = (identifying)
9. $\overline{\text{p}}$ = (identifying)
10. $\overline{\text{b}}$ = (water)
11. $\overline{\text{h}}$ = (sphere)
12. $\overline{\text{t}}$ = (identifying)
13. $\overline{\text{p}}$ = (water)
14. $\overline{\text{i}}$ = (abstract ideas)

When writing a word an Egyptian scribe could choose between various methods. He could, for example, simply write the appropriate ideogram followed by a vertical stroke —

$\overline{\text{j}}\overline{\text{j}}$ = p-r (house)

More frequently he would use single consonant signs followed by a determinative —

$\overline{\text{j}}\overline{\text{j}}\overline{\text{b}}\overline{\text{n}}$ = w-b-n (rice/shine)

$\overline{\text{w}}$ = w

$\overline{\text{b}}$ = b

$\overline{\text{n}}$ = n

$\overline{\text{b}}$ = determinative (sun)

Or he could use a double consonant sign, followed by two single consonant signs, repeating the two consonants already expressed in the double consonant sign, followed by a determinative —

$\overline{\text{j}}\overline{\text{j}}\overline{\text{j}}\overline{\text{n}}$ = m-r (pyramid)

$\overline{\text{j}}\overline{\text{j}}\overline{\text{j}}\overline{\text{j}}\overline{\text{m}}$ = m-r

$\overline{\text{r}}$ = m

$\overline{\text{r}}$ = r

$\overline{\text{b}}$ = determinative (pyramid)

In addition to hieroglyphic (from the Greek hieroglyphikа grammа — sacred carved letters) the Egyptians employed two more scripts – hieratic (from the Greek hieraticos = priest) and demotic (from the Greek demотhos = popular). Both were descendants of the hieroglyphic script. By the time that Greek names came into existence (c. 200 AD) hieratic was used only for religious texts (although in earlier times it had also been used for literary texts, business documents and private letters), whilst demotic was reserved exclusively for secular purposes. Hieroglyphic writing (fig. 38) was ideally suited for the carving of inscriptions on royal, religious and funerary monuments made of stone; it conveyed