By the 10th century more than twenty different cursive styles were in common use, many of them lacking in elegance and discipline, all of them in danger of degenerating into an endless multiplicity of styles. It was time for a reform, and the reform came in the person of Ibn Ma‘shūh (d. 940), an accomplished calligrapher from Baghdad who, by the later part of his life, had served as Vizier to three Abbasid Caliphs. Ibn Ma‘shūh set himself the task of radically redesigning the cursive script so as to make it a vehicle suitable for the writing of the Koran. He laid down a comprehensive system of calligraphic rules based on the rhombic dot, the ‘standard’ alif and the ‘standard’ circle.

The rhombic dot is formed by pressing the pen diagonally on paper so that the length of the dot’s equal sides are the same as the width of the pen. The ‘standard’ alif is a straight vertical stroke measuring a specific number of rhombic dots (five or seven according to the style) placed vertex to vertex. The ‘standard’ circle has a diameter equal to the length of the ‘standard’ alif. The ‘standard’ alif and the ‘standard’ circle also supply the basic geometric forms for fashioning the individual characters (rus., p. 18).

After Ibn Ma‘shūh several other famous calligraphers added their contribution to the perfection of Arabic calligraphy, but without altering the basic principles of his system.

Ibn Ma‘shūh is in fact supposed to have already applied his rules successfully to the naskh, the six major cursive scripts of classical tradition: Thuluth, Nashī (see fig. 59), Muhaqqaq, Rayhani, Riqa and Tawqi.

WESTERN CALLIGRAPHY

regularity, organization and (at times individualistically interpreted) disciplines are the hallmarks of Western calligraphy. These qualities were already apparent in the capital or monumental script of Imperial Rome. The basic forms of this script are the square, the circle and the half-square. The square in addition provides the ‘perfect number’, namely ten; the width of the main line of each letter is supposed to measure one-tenth of its height. All letters (of an inscription) are of equal height, as if written between two invisible horizontal lines. The finishing line (serif) at the top and/or foot, a by-product of the way letters are cut into stone with a chisel, accentuates the impression of overall harmony:

**SBRO**

This script had no ligatures or abbreviations and was, like the early Greek script, ideally suited for inscriptions on stone and metal; written with a (square) pen, it was also used in
some of the earliest codices. Alongside a more narrow and condensed variety, the rustic script (fig. 103), appeared in inscriptions as well as in manuscripts. Already at the beginning of the Christian era the Romans had developed a large variety of styles to accommodate the various aspects of everyday life; besides those suitable for inscriptions, there were the still quite formal book hands as well as more cursive styles appropriate for notes of a personal, administrative or commercial nature. The main book scripts of the late Roman period, uncial (fig. 104) and half-uncial, favoured a reduction in the size of individual letters and a tendency towards greater cursiveness. They also introduced the four-line system (in place of the old two-line system) to accommodate the formation of individual ascenders and descenders:

```
ABCDFGabcdefg
```
introduced to Ireland. From there, as a result of missionary foundations by Irish monks, the New Irish script was brought to Germany ( Fulda), France (Tours), Italy ( Bobbio) and Switzerland (St Gallen). In Britain (see Plate VI), where Christianity had been introduced by Irish and Roman missionaries, the resulting combination of styles led, in the 8th century, to the evolution of the Anglo-Saxon hand, a script which prevailed until well after the Norman conquest. Because of their geographical isolation Britain and Ireland were able to maintain a certain overall uniformity as far as the more formal book hands were concerned, but on the continent of Europe a large number of local styles developed, such as for example the South Italian Beneventan (fig. 105), the Frankish Merovingian (fig. 106), the Spanish Visigothic, and many other scripts. This process of disintegration was eventually brought to a halt by Charlemagne (742–814 AD) whose newly-won Empire
brought a measure of unity to Western Europe. Under his guardianship and that of his successors there emerged a new style of writing, the Carolingian minuscule (fig. 107), which was to servecourtly and monastic establishments alike.

The Carolingian minuscule was a script of great clarity and overall harmony, which used the four-line system, few ligatures and abbreviations, and often artistically embellished capital or uncial letters for initials (figs. 104, 115) and headings. This clarity of graphic design was partially lost later with the creation of the other major script, the Gothic

107 Bede: Expositio in Luctam. Like the pages from the Mozarab-Granval Bible (fig. 194) a good example of what was known as the hierarchy of scripts; in this case Rustic capitals (for the major headings), uncial for the first line of the Liber tertius, and Carolingian minuscule for the rest of the text; Town c. 820, with late 10th-century additions. (Bodleian Library, Oxford, Ms Bodl. 214, f.12v)
This is only an abbreviated and condensed account of some of the major developments of Western calligraphy, but it shows the elements which were responsible for the creation and dissemination of such styles as the Church first and foremost, but also secular institutions such as courts, chancellories, scribal workshops (see p.157) and to some extent ‘national’ trends. The Church, by taking over the mantle of Rome, had inherited a sound worldly appreciation of practicalities and a deep respect for law and orderliness. The monks working in the scriptoria of the great monasteries, for example, saw their labour more as a practical way of safeguarding Christianity than a means of direct communication with the absolute; they were devout men but not necessarily mystics.

**Chinese Calligraphy**

Writing materials and writing implements have always played a major role in the development of calligraphic styles. There is still an element of permanence and imposing dignity, so characteristic of Roman stone inscriptions, from which they ultimately derive, in the shape of present-day capital letters. The way the pen was cut and held became responsible for the shaping of calligraphic trends. This intimate interaction between style, writing material and the tools used for writing is nowhere more apparent than in the case of Chinese calligraphy.

Chinese calligraphy begins with the invention of the brush. The earliest style — the 'script of antiquity' — was either engraved in stone, incised with a metal stylus or knife in bamboo, wood and bone, or later applied with a bamboo stick dipped in lacquer on to wooden slips or bamboo tablets; some scholars claim that quite early on some form of ink was also in use (Hitt, p.168). Under the Zhou emperor, Xuan Wang (827–781 bc), some elements of standardization were introduced, and the resulting style became known as the 'great seal' script. In the centuries that followed, a number of simplified variations developed in the provinces, which by the 3rd century bc led to the formation of the 'little seal' script. These early styles have a certain archaic beauty (see fig. 48). The original pictographic elements of many characters are still clearly visible, and the individual characters are bold, well-proportioned within themselves and in relation to each other, but they are not yet calligraphy.

Traditional sources credit Meng Tian (d. 209 bc) with the invention of the brush (Hitt, p.159), but it is possible that at least a form of it was known and used much earlier, characters inscribed on Shang and Zhou bronze vessels, for example, often appear to have been formed after writing-brush patterns. The full effectiveness of the brush depended on the use of soft writing materials, which became available mainly during the Han period (206 bc–220 ad) — materials such as silk, 'slip-paper' (see p.42) and, after 105 ad, paper (see p.44). Paper, brush, ink and the ink-slab — the 'four precious things' of a scholar's study — changed the appearance of Chinese writing. A new style called h i chu, the 'official' or 'clerical' script, arose, only to be superseded in the 4th century by the 'model' or 'normal' script, ku t shu (fig. 110). The latter underwent hardly any further change, and is still the authoritative medium for the writing and printing of Chinese.

Quite early on, a number of elegant and sophisticated cursive forms developed alongside the more formal styles, such as the 'running script' or the 'grass script' (fig. 111); the latter is rather difficult to read, and looks, at least to those not conversant with Chinese writing, visually entirely different.

The Chinese brush, about 30 centimetres in length according to ancient measurement, consists of holder, hairs and sheath. The hairs are a mixture of rabbit, deer and goat hairs, bound with a silk or hemp string at one end, covered with lacquer to stiffen them, and
The pictorial heritage of the characters is never entirely lost. The individual strokes are related to natural objects (Gib, p.382). Excessive symmetry is avoided, each character seeming to be suspended in an imaginary square.

Chinese calligraphy is closely connected with Chinese painting: painter and scribe use similar material (paper), similar implements (brush and ink) and, to a large extent, have the same technique. In traditional China, to be ‘master of the three arts’ — calligraphy, painting and poetry — was the hallmark of a truly educated, truly cultured, if not to say superior, person.

Illustration, illumination and picture-writing

A written text can be made aesthetically more pleasing in a number of ways. Calligraphy is one possibility; but there are several others. Some of them are well within the scope of an accomplished scribe, others need the assistance of craftsmen and artists.
The simplest form of ornamentation, arising naturally from the process of writing, is the embellishment of letters, especially initial letters (see figs. 36, 104 and Plate VI). Or the text can be written in the shape of objects, geometric and abstract patterns, animals or human beings. Picture writing as such has always found a place in magic and in the preparation of amulets, but as a distinct literary art form it can be traced back to the Greek poet Simias, who in the 4th century BC wrote poetry in the shape of an egg, a double axe, and the wings of a bird. Simias was not the only Greek poet who used this art form; the tradition continued and was eventually, in the 6th century, introduced into Christian Europe by the Bishop of Poitiers, Venantius Fortunatus, who wrote his poem De Sancta Cruce in the form of a cross. Calligrams (text pictures, where the shape of the object or layout of the text is determined by the subject matter of the writing itself) remained popular throughout the Middle Ages, the Baroque period, indeed right up to the present time (fig. 112) — as such practitioners as George Herbert, the Dadaists, Hans Arp, Dylan Thomas, Robert Herrick and many other poets testify. The Concrete Poetry movement, much talked about in the 1960s, revived and popularized the tradition. The term 'calligram' was first introduced by the French poet Guillaume Apollinaire to describe his own works, published in 1918. Calligrams are, in the words of the French concretist Jean-François Bory, 'writing writing itself'.

Calligrams are not confined to the West. Arabic calligraphers were especially skillful in twisting and stretching the lines of elongated Arabic letters into elegant animal shapes (fig. 113) or imposing architectural patterns; and Chinese and Japanese scribes created human figures, even portraits, in this fashion.
Another branch of picture-writing is micrography. Here the script can be reduced to minute size: the whole text of the Koran, amounting to 77,954 words, has been written on the shell of one single egg (VHS, p. 30). In addition, the individual lines of writing are used to 'draw' a picture. Micrography is known in most parts of the world — in the Far East, Southeast Asia, India (fig. 114) and in Western Europe; some of the most splendid examples are found in Hebrew writing, especially in the representation of the masoretic notes (fig. 115).

Picture-writing is without doubt already a form of illustration, but illustration still entirely under the control of the scribe. In a colophon of the (7th-century) Lindisfarne Gospels four persons are named as contributors: Bishop Eadfrith of Lindisfarne, who is said to have written the text; Bishop Ethelwald, who is given credit for the binding; Billfrith the Anchorite, who provided ornaments of gold and silver and the jewels for the outer casing; and finally Aldred, who inserted the Anglo-Saxon gloss (see Plate VI). It is generally assumed that Eadfrith not only wrote the text — a task he is supposed to have completed in no more than two years — but that he was also responsible for the lavish and intricate illustration which forms such an integral part of the whole manuscript. Though this is by no means the only case where writing and illustration were the work of one and the same individual, more often the task was done by different specialists.

Manuscript and text illustration was not an invention of the Christian Middle Ages. The Egyptian Books of the Dead, papyri placed in tombs with other offerings, were lavishly illustrated. Illustrations accompanied stone carved inscriptions in Egypt (see fig. 38), Mesopotamia and many other parts of the world. It could be argued that at a certain stage...

114 The goddess Annapurna giving rice to the mendicant Sita, composed of repeated innovations to Buddha written in the Bengali script; mid-19th century. (Victoria and Albert Museum, D. 422-1889)

115 Pentateuch with Masorah; the masoretic notes have been written in the shape of a dragon; early 14th century. (British Library; Oriental Collections; Add. 21660)
illustration is writing; the Mide song-boards, notices, wintercounts (see p. 66) — in fact, all truly pictographic scripts. Sometimes the balance between writing and illustration changes dramatically: whereas we are used to a lengthy written passage supplemented by an (explanatory) illustration, in the case of some Southeast Asian or Indian picture-albums, or certain types of Chinese and Japanese scrolls, prominence is given to the painting, and the text — short and sparse and often moved to one corner or to the outer edge of the composition — takes on the tenor of an (illuminative) explanation.

Illustrations are not always directly related to the text. Sometimes the illustration is a portrait, an icon or the representation of a deity, and as such a focal point of meditation for the not yet fully initiated or those unable to read; sometimes it can take on magical properties and become an amulet, a protector of the text, the donor, the scribe or the person using the text.

Illumination is a rather specialized form of illumination (in popular usage the two terms are often interchanged) which was used with dazzling effect on the pages of Korans, medieval Christian manuscripts and, equally, Jewish manuscripts (quite often prepared in the same workshops). The illuminator (from illuminare — to light up, throw light upon) works not only with colours but also with precious metal, applying thin leaves of beaten gold to initials or to the background of a miniature.

Politics, religion and writing

For the non-believer and the non-partisan the difference between proselytizing, prophetic religions and political ideologies seems minimal. Both aim at unification for the purpose of control, both demand sacrifices in return for promises to be realized in some non-verifiable future: heaven, another life, the next generation. Both depend on propaganda, on effective information storage and information dissemination to increase their ranks by new converts while at the same time preventing heresy. Often religious and political ideologies combine to support each other’s imperialistic tendencies towards maximum expansion. For all this, writing is the ideal tool. Written information can easily be controlled and verified; if heretic tendencies are discovered they can quickly be eliminated. (It is more difficult to change the minds of men than it is to burn a book.) Oral traditions leave too much to the discretion of the individual, and thoughts are less easily controlled than written texts. Writing has a further advantage: it multiplies information and by doing so makes the (right kind of) information more readily available to a much larger audience. Printing is even more effective, and has indeed been eagerly seized upon by all those anxious to promote their particular version of the truth. The process of (religious and political) conversion removes the individual from the security of his previous environment, negates most of what has so far served as background for his identity. If the conversion is to be successful and permanent, this sudden vacuum must be filled, quite speedily, by new visions, new concepts, new cultural possessions. Apart from the abstract reality of the new faith, the convert needs something more concrete to compensate him for what he has lost: a new social order, new moral aims, a new language, a new script.

For well over a millennium Islam and the Arabic script have maintained a wide sphere of influence at times stretching from Spain to Southeast Asia. For an even longer period Christianity and the Roman alphabet have dominated first Europe, then the Americas, Africa, Asia and the Pacific. Though this domination has been predominantly religious in nature it could on occasion provide the nucleus for the establishment of substantial empires. In Soviet Russia, Communism and the Cyrillic alphabet did at one time form a similar alliance, successfully eliminating most other forms of writing (see p. 136).

A common script is a strong tool for unification. Neither China nor Mesopotamia would have survived and prospered without it. Mesopotamia has always been, throughout its history, an area of conflict where the centre of power fluctuated between ethnically and linguistically unrelated groups. But the economic survival of Mesopotamia, linked with irrigation, depended on a continuously effective system of administration which transcended temporary allegiances. Kings were expendable — they could easily be replaced by other kings; but communal agriculture and trade could not function without a minimum level of stability. Continuity and stability were largely provided by the scribe-administrators who, for over 3,000 years, irrespective of political changes, used the cuneiform script first created by the early Sumerians (see p. 65).

In China the situation was more complex. Since the Chinese script does not depend on
writing and the Hebrew script spread to all corners of the world, for very special and quite different reasons. Hebrew writing did not go out to spread any new message, or attract new converts; it followed its own widely scattered people to reassure them of the validity of their own tradition in an alien and, more often than not, hostile environment.

Apart from possible connections with religious and political ideals, the written word has power of its own. Verba volant, scripta manent (‘the spoken word passes, what is written remains’) can be reassuring or it can be a threat, depending on where one stands. Because of its implied permanence and the fact that understanding depends on a period of initiation (the time it takes to master a particular script) the written word can take on the power of an amulet. The Egyptian hieroglyph for amulet was looked upon as a symbol of eternal life and good fortune long after its original meaning had been forgotten. There are the phylacteries with sacred writing which devout Jews wear during prayer, and the inscriptions on the doorposts of Jewish houses which are supposed to protect the inhabitants from misfortune. Even Muslims carry amulets which enclose passages from the Koran. Christians ascribe equal power to the Bible, laying it on the body of the dead, fanning sick persons with leaves taken from it, or using it as the ultimate protection against all evil emanating from the devil, the great adversary of the Lord.

Such power creates fear. Hostility to writing has never been restricted to tribal/traditional societies. Throughout history there have been sudden periodic outbursts of book-burning, of the destruction of whole branches of literature, or of a temporary turning away from literary learning. In 213 BC Shi Huang Di, the first emperor of Qin, for example, asked that ‘all books in the historical archives, except the records of Qin, be burnt; that all persons in the Empire, except those who hold a function under the control of the official scholars, daring to store the classical literature and the discussions of various philosophers, should go to the administrative or military governor, so that these books may be indiscriminately burnt’. In 15th-century Mexico, Spanish priests, in part under the guidance of Bishop Landa, a great expert and to some extent admiring of indigenous culture (see p.145), indulged in a similar and unfortunately much more effective destruction of Maya literature. In Spain the Inquisition, when sending Jews to the pyre, burnt them together with their Talmud; in other Christian countries the same fate awaited heretics from time to time. Christian and Muslim rulers have periodically destroyed the libraries of their predecessors. In our own century we have witnessed the book-burning programmes initiated by Communists and Nazis, and after the Second World War a similar destruction of all Nazi tainted literature was carried out. In China the Cultural Revolution showed its distrust of literary education, which it associated with the continuation of unwarranted privilege, by closing universities and printing presses, and sending all intellectuals to work in the fields. What all totalitarian movements (political or religious) fear most is not so much writing itself as the fact that writing encourages critical thinking, thus opening the door to heresy and dissenion. To the Zen saying, ‘if we are silent we are one, if we speak we are two’ one could add, ‘if we are able to write we may become many’.

he spoken language, it was in itself (and after 4,000 years still is) the best tool for administration in a vast country inhabited by different linguistic groups. In the early part of the first Christian millennium Buddhist texts were written in Chinese, spread Chinese writing and Chinese influence further east, to Korea and Japan. In other words, Buddhism was the medium for the transmission of the Chinese script and the Chinese language, not the other way round. But then Buddhism in its prior state is neither a religion (there is no god, no soul, no final judgement, in fact nothing to bind — religion in Latin is the bond to its creator) nor a political ideology (each individual is truly an island; there is no causal connection between this generation and the next). Not that Buddhism was hostile to writing. In fact the first literary evidence of a more widespread use of writing in India comes from 5th-century BC Buddhist sources. Buddhism was anxious to promote a castless society in which all had access to the same central core of information — towards the achievement of which committing the essential texts to writing (in Pali, the language of the people) was an important step. Though to some extent a revolutionary movement, Buddhism was certainly not a prophetic religion in the Mosaic tradition. Like Christianity, Islam and Communism, it grew by adding new recruits, but unlike them Buddhism did not want to change the world; its aim was to encourage the individual to withdraw from its contradictions into the realization of a more absolute harmony. Any language, any script, any form of information storage was adequate for its purpose.

The attitude of tribal/traditional societies to writing is radically different. Tribal societies are by nature exclusive; they have no message to spread and see outside influences mainly as a threat to their own integrity. Survival is a group effort, and depends largely on the preservation of the status quo. As we have seen, writing is both a means of unification and a tool for disruption; it can enlarge (by converting outsiders to one’s creed) and diminish (by introducing alien ideas). Written information cannot be monopolized and protected as easily as information that is memorized.

Hindu society, which assigns special privileges and special duties to each caste, had little use for writing. The memorizing and the recitation of the sacred Vedic hymns which ensured the well-being of the community and the continuation of the universe was in the custody of Brahmans, at the apex of the hierarchy depended on the retention of this monopoly. They knew when, how and in the presence of whom the hymns could be recited — and who was fit to share this information. Dilution of knowledge often means dilution of power. According to the Manusmriti, the classical treatise on Hindu law (which did much to ossify Hindu society by reinforcing the sanctity of the caste system, especially the supremacy of the Brahmans) a Shudra who heard even by accident the recitation of the hymns should have his ears filled with molten lead, the tongue torn from his mouth to prevent him from repeating what he had heard, and his body split in twain.

Thus the vast mass of Indians bordering on parasitism. It is thus hardly surprising that Hindu society was either hostile or at best indifferent to writing, and long after writing had, of necessity, been accepted, great care was taken to prevent this knowledge from falling into the hands of those who had most reason to rebel against the established order, namely women.

There is another interesting point. Since writing was never an integral part of (Hindu) Sanskrit culture, the powerful combination of language, script and religion which we have witnessed in the case of Arabic language/Arabic script/Islam, and Latin/Roman script/Christianity, never occurred. To this day Sanskrit, the classical language of Hinduisim, can be written in any Indian script except Tamil (see p.11). Certain similarities exist between traditional Hindu and traditional Jewish societies.

Both are strictly exclusive (one is born a Jew or a Hindu, one cannot become one); both discourage contact with outsiders. Yet during the 2,000 years of the Diaspora, Hebrew
Writing for special groups

Up to a point all writing is writing for special groups — those which have mastered a particular script. In some societies and under certain circumstances such groups will by necessity be small (we remember the meticulously trained professional scribes of Egypt and Mesopotamia); in other societies the knowledge of writing can be so widely dispersed as to foster illusions about the universal nature of writing as such, and of one script in particular. Sometimes the wide use and the sheer popularity of a script can overshadow this inherent element of exclusiveness: few people brought up in our Western civilization will consciously think of the alphabet as a limited form of information storage. Such natural exclusiveness, inbuilt in the very process of writing, is however different from that created on purpose and meant to serve special needs, such as shorthand and speed-writing for commerce and legal practices; Braile for the use of blind people; hob and gypsy signs for minority groups outside the normal range of society; cabalistic practices related to religious speculation and to magic; morse, codes and ciphers which play a part in war and in diplomatic intercourse, and all forms of secret and enigmatic writing. In the latter case a particular script is specially created to enhance and protect the exclusiveness of a particular group, or at least to provide such a group — which would normally be excluded from the use of writing for reasons of either physical or social handicap — with its own mode of information storage.

Memory aids have strong elements of exclusiveness, since very often they can only be understood or read with the aid of additional orally-supplied information. Australian message sticks (see fig. 1) for example are cut in the presence of the actual messenger, who has the various notches and incisions carefully explained to him. The pustuhas of the Batac medicine men of Sumatra (see fig. 22) are private notebooks which contain the sum total of personal knowledge acquired during a long period of apprenticeship. They are primarily for the use of just one person — the one who wrote them in the first place. Similarly the Moso script (see p. 87, and fig. 51) of the Nakh people of south-western China can only be read with the help of a trained priest; and the same holds true for the script used in the Aztec codices (see Plate 1) of Central America. None of these are truly secret scripts, however; they were not specifically created for the purpose of guarding a special type of information, and in most cases both the script and the interpreter are closely integrated with the rest of society.

SECRET SCRIPTS

Various elements can lead to the creation of secret, or at least enigmatic, scripts. Both the Ogham script (see fig. 85) and the Runes (see fig. 84) are connected with secret writing. The Nsibidi script of the Uyangas of Nigeria was in principle only used by members of the Nsibidi secret society, though some signs were also understood by outsiders. Nsibidi, which was unknown until 1905, is a purely ideographic script, using already highly conventionalized picture signs and also purely symbolic representations:

A man and a woman sleeping together on a bed; it is very hot and they put their arms outside. The short strokes at the bottom of the picture sign represent the legs of the bed.

A boy kept a girl as his friend until they both grew up. Then he married her and they lived together and made their bed with pillows for the feet and also for the head.

A man and his friend went to town to find two girls; one found a girl and took her to his home; the other could not find a girl so the two men parted company. (DD, p. 150)

Nothing is known about the origin of this form of writing, but there exists a charming local legend which describes how the Uyangas learned it from the baboons who caused and sat round their camp fire. Some scholars have speculated about possible connections with Egyptian hieroglyphs since the Nsibidi sign for house is (like the hieroglyphic sign for house — see p. 63) of rectangular shape, whereas all the local hats are round; but this seems a rather tenuous connection.

Belief in the special significance of the letters of the Hebrew script is central to cabalistic thought. Certain esoteric knowledge can be expressed and communicated by seemingly unintelligible combinations of letters and the use of their numerical value. Thus the Torah can be read simply as a text written in Hebrew script, but there also exists another mystical reading which perceives the Torah as composed of the secret names of God.

Abulafia, who was born in Spain in 1240, when looking for an absolute object to meditate upon — one capable of stimulating the deeper life of the soul by freeing it from ordinary perceptions — believed he had found it in the letters of the Hebrew script. Starting from the abstract and non-corporeal nature of scripture he developed a theory of mystical contemplation of letters and their configuration as the constituents of the name of God. His Nohveh ha-Tier (science of the combination of letters) shows how the adept engages in combining and separating the letters in his meditation, how he deeply enjoys each combination in every direction, how he composes motifs on separate groups, and so forth. Each letter represents a whole world and the mystic must abandon himself to its contemplation (fig. 116). Abulafia equates his meditation with mystical logic, which moves the adept towards a realization of the secret name of God and into a world of truth bliss. But it is a way not without danger, a journey that must be undertaken with proper control and discipline, for as each letter is also coordinated with a special member of the body ‘one has to be most careful not to move a constituent or vowel from its position for if one errors in reading the letter commanding a certain member, that member may be torn away and may change its place or alter its nature immediately or be transformed into a crippled shape so that in consequence that person may become a cripple.’ (GGS, p. 138)

In the realm of practical Kabbalah belongs the tradition of the ha-emot, the angelic pets, thought to have been created by archangels such as Metatron, Michael, Gabriel and Raphael. Some of these scripts are probably derived from early Hebrew or Samaritan scripts, but there are others which bear a strong resemblance to cuneiform writing. In cabbalistic literature they are also known as khitre anayimin — eye-writing, because
individual letters are composed of lines and small circles (the wedge of the cuneiform script). Sometimes such letters are used in a text, otherwise written in normal Hebrew characters (fig. 117), for writing the Tetragrammaton or the divine names Shaddai and Elohim. Because of their magical properties they are also used in amulets. Some scholars have suggested that they are imitations of cuneiform signs created by persons who knew cuneiform writing without understanding it.

< 116 Moshe Conder and Pardes Rimonim; Crano, 1592. The letter aleph, representing the harmonic unity of the ten Sefirot contained in it. (British Library, Oriental Collections; 1968, f.4)

117 Book of Adam and Raziel; Amsterdam, 1701. Text in Hebrew script intermixed with kalonion (angelic pen). (British Library, Oriental Collections; 1967, c.5)
The term cryptography (from the Greek kryptos—hidden, and graphein—to write) refers mostly to the use of scripts for the purpose of secret communications in connection with governmental, military, diplomatic and to some extent also commercial and industrial information. In practice this means that a written text can be converted into a cryptogram, with the help of a cipher or code, or both. Though basically there exists little difference between the two (up to a point a code is simply a more complex cipher), the two are usually regarded as separate. Broadly speaking, in a cipher textual units of constant and equal length—usually one letter, sometimes two, rarely three—are replaced either by a process of transposition (rearrangements of the letters in the actual text) or by substitution (replacement of the letters in the actual text by other letters or symbols without a change in sequence) in such a manner as to create a new text which will be meaningless to all but those who possess the key to the person who enciphered the text in the first place. Various refinements are possible, and either one or more cipher-alphabets can be used. In the case of a code, the textual units which undergo cryptographic treatment are of varying and unequal length—letters, entire sentences, phrases, syllables or numbers. It is a more complex system, more difficult to work, more time-consuming to use and up to a point more effective.

Cryptography has been in use since ancient times. Towards the end of the Phoenician period and increasingly so during the time of the Roman emperors, Egyptian hieroglyphs could be used in this fashion. Certain signs were deliberately substituted by similar-looking ones, creating a wholly bizarre form of spelling, unintelligible to all but the initiated. Altogether three different cryptographical systems seem to have been in use, much to the confusion of those who have worked at the decipherment of the hieroglyphs. The Greeks similarly used cryptography, mainly for communications between commanders in the field and their superiors back home. The same can be said about Rome; in fact the first treatise on cryptography was composed in the 3rd century BC by Aeneas 'Tactica'. The beginning of modern cryptography however, like that of modern diplomacy, goes back to Italy, to the Papal courts and those of the early Italian republics. From 1400 onwards ciphers became increasingly more complex and in the 16th century important improvements were made in France which soon reached England and other European countries. In the middle of the 19th century the increasing use of electromagnetic telegraphy stimulated an extension in both content and repertory, and by the end of the century large ciphers containing 100,000 and more words and phrases were compiled for governmental, and from now on also for commercial, communications. As technology advanced, codes and ciphers became increasingly more sophisticated, especially after the introduction of automatic cipher machines around 1925. But the same new technology which improved the effectiveness of codes and ciphers could also be used for breaking them, and overall the balance between the protection of secrecy and the possibilities for the penetration of cryptographic communication remained more or less the same.

WRITING FOR THE BLIND
Blind people read by touch, by running their fingers over a script specially devised for their use. The first authentic record of such a system comes from the beginning of the 16th century. It was the invention of a Spaniard, Francesco Lucas, and its basis rested on the idea of engraving letters upon wood. About a century later a French notary by the name of Pierre Moreau cast movable leaden type for the same purpose. A number of similar attempts were made, until eventually Hauy succeeded in embossing paper with such a script.

The basis of nearly all the early systems was a variation of the normal alphabet, and though this meant that at least people who had not been born blind could learn to master the script without undergoing yet another radical shift in perception, they had one serious disadvantage: they could not easily be written by blind persons. In the first half of the 19th century Louis Braille, a blind teacher in the Institut National des Jeunes Aveugles, developed a new system based on combinations of dots which could be written, and later also printed, with relative ease. In 1852 a universal Braille code for the English-speaking world was adopted by representatives of agencies for the blind of Great Britain and the United States.

The Braille alphabet consists of varying combinations of one or more raised dots in a six-dot oblong known as a Braille cell, which is three dots high and two dots wide. There are sixty-three possible combinations which provide for all the letters of the alphabet and also for punctuation, contractions etc. Combinations of dots have also been worked out to signify mathematics, music and other specialized fields. Braille is written with the aid of a metal slate or on a specially-constructed Braille typewriter.

SHORTHAND
The need to write with sufficient speed to record human speech has been responsible for a form of writing commonly referred to as shorthand. Until very recently shorthand was essential for reporting the proceedings of parliamentary and legislative bodies, the trials of cases in courts of law and above all for the smooth and speedy execution of business correspondence. Shorthand is however not an invention of modern times. An efficient form of shorthand, based on orthography, was used by both Greeks and Romans (see fig. 15); in fact an example has been found on a marble slab from the Acropolis in Athens dating from the 4th century BC. The earliest record of an organized system comes from 58 BC and is attributed to Marcus Tullius Tiro, a freedman and friend of Cicero. The Tironian notes, originally designed to record speeches in the Senate, were taught in Roman schools and outlived the fall of the Roman Empire; in 625 AD they appeared for example in the royal diploma of the Merovingian king, Clotaire II, and the early Christian church too made extensive use of them both for recording the words of important church leaders and for taking down accurate accounts of trials. In England shorthand, still based on orthography and the alphabet, staged a revival in Tudor times, when in 1588 Dr Timothy Bright published his Characters: or An Arte of Short, Swift, and Secret Writing by Character. It was not before the 18th century that the idea of shorthand based on sound instead of orthography began to gain favour, until eventually, in 1857, Isaac Pitman published his Stenographic Sound Hand which marked a new era of sound-based systems.

ROGUES' CODES
There is finally one more section of society which needs its own, and as far as possible secret, form of information storage. This comprises the groups which either by birth or from choice function, at least in part, outside normal society: criminals, terrorists, thieves and all types of social drop-outs. Since theirs is neither a particularly literate nor language-conscious sub-culture the necessary information can comfortably be expressed through pure pica-pography. Into this category fall the Germanenorden or Germanerorden, criminal codes which give warning, mark victims and advertise insufficiently protected property. Such signs are documented from at least the early part of the 16th century. The most complete collection (17,000 signs) is perhaps that published by J. Gross in 1899 (i), p. 46, Paul Scott in his A Division of the Spoils describes how during the disturbances which followed the