tion. Only the longer hairs of healthy animals were used; they were bound into clusters of equal length, carefully de-greased to enable them to hold ink and water, and then blended with plant fibre (usually hemp) for softness. Washed and trimmed, a suitable number of clusters, treated with an adhesive, was collected to form the final brush head. This brush head had to be carefully dried (first on a bed of charcoal ashes, then by hanging it up), inserted in a handle made of bamboo, wood, ivory, horn, or porcelain, and finally glued into it with molten resin (18c. p.120). The most commonly used brushes fall into two basic categories: dakai bi, for writing large characters, and xian kai bi, for writing small characters as well as letters or documents.

In Japan (where writing implements have not changed since calligraphy was first introduced from China) the thick brush (futufude) produces the main body of the text, and the slender brush (housufude) is used for inscriptions, signatures at the end of a work, or for small and/or more cursive characters.

For writing (and painting) in China painter and calligrapher use the same tools and the same materials; the brush is held, vertically and unsupported, between thumb and index finger, the middle and ring finger resting on the holder as guides. The fingers are only lightly closed; Chinese calligraphers stress that it should be possible to hold an egg in the hollow of one’s hand. Using the brush is very different from using the pen. Whereas Western and Islamic calligraphers achieve their results largely by the way they carefully trim the nib of the pen, and by the angle at which the pen is held during writing, Chinese calligraphy is a rhythmic art. While the pen moves, the brush dances. (The Tang calligrapher Zhang Xun who was active between 710-750AD claims to have derived his Mad Grass style from watching a sword dance performed by the lady Gong Sun.) Effects are achieved by lowering and raising the brush, drawing it towards, and flicking it away from oneself. Not only the fingers, but the hand, the arm, the whole body. Indeed the whole personality of the scribe are involved in the process of writing. The shoulder should start each movement by leading the arm, the arm should lead the hand; at the beginning of a line the right shoulder should balance; the brush at the left side, at the middle of a line both brush and body are in balance, towards the end of a line the left should gradually serve as a brake and at the same time balance the brush on the right side (18c. p.134). To achieve mastery of the brush [9] is no mean feat. The deceptive speed with which the writing is executed is the result of discipline, much training and practice, long periods of concentration, and a deep understanding of the characters, the lines of each character, the order in which they have to be written, the relationship of the individual lines within each character, and of the characters to each other; and, finally, of the correct position of each line and each character in space. Space is of the utmost importance in Chinese calligraphy and painting. Laozi (Born 571BC), the founder of Daoism, explains its function by saying ‘vessels may be made of clay but it is the space inside them which renders them useful.’

9. Pu Quan (1912–
1991), the cousin of the
last Chinese Emperor
and great-grandson of
the Qing Emperor Dao-
guang, a well-known
20th century painter
and calligrapher, dem-
onstrates the use of the
brush.

BY COURTESY OF KATY
YALATI

The first treatise on calligraphy, written by Lady Wei Shao (272–349AD), states that a character must have neither too much ‘bone’ (structure) nor ‘flesh’ (consistency) nor ‘sinew’ (composition), but that all three must be in the right relationship to each other. Some of the principal brush strokes are: centre brush (the foundation of both painting and calligraphy, it produces a neat, clear-cut line with a hard edge on both sides and is written with the tip of the upright brush), side brush (tilting the brush to produce a wider stroke), rolling brush, pulling the brush, point brush, split brush, turning and folding the brush (18c. pp.141–170) and so on. Other important considerations are the pressure of the brush on paper, and the speed of writing. Speed affects the flow of the ink and creates a feeling of movement within each line; moreover, a line once drawn is a final entity, which cannot be corrected or improved.
INK

Until the middle of the 19th century two basic types of ink were used: carbon inks and iron-gall inks. Carbon inks are normally made of a lamp black (obtained by burning carbon-containing organic matter with insufficient air supply) which is mixed with water and glue, or vegetable gum (for example gum-arabic, the dried-up sap of the acacia tree brought to Europe from Egypt and Asia Minor). The purest form of lamp black can produce a fine, intensely black image. Carbon inks were used in Egypt on pottery and papyrus as early as 3000BC and many of the surviving examples have retained their dense black colour to this day. Being chemically very stable, carbon inks contain no substance injurious to any writing material, but since the carbon particles are simply deposited on the surface, they can also easily be wiped off and erased.

After 300AD the increasing popularity of parchment (in place of papyrus) in Western Europe and in the Middle East made iron (that is, oak gall) inks a better medium; but carbon-based inks continued to be used alongside iron-gall inks in medieval manuscripts up to the 12th century. Iron-gall ink is prepared by soaking crushed galls (which contain gallo-tannic acid) in water and adding copperas (ferrous sulphate) and gum to the infusion. Copperas was manufactured naturally in Spain by evaporating water from ferrous earth; by the late 16th century it was probably produced by pouring sulphuric acid over old nails and mixing the liquid with alcohol. This mixture was then added to the iron-gall potion and, according to a 16th-century calligrapher/scribe, stirred ‘offe’ with a fig stick (criti p.33). The final product was a colourless mixture which darkened after oxidation and eventually developed a black deposit. Iron-gall inks can fade with age and often eat into the parchment causing considerable damage; they are however not easily erased from the page. Medieval scribes also used a variety of coloured inks, mainly red (for headings, titles, initials, rubries, or for marking ‘red-letter days’ in calendars); red ink was mostly made with the aid of vermilion and was in consequence rather costly.

Recipes for making ink abound from antiquity. In his dissertation on the medical use of herbs, Dioscorides, the physician of Antony and Cleopatra, gives an exact account of the proportion of lamp-black and oil necessary to produce fine carbon ink. The Roman architect Vitruvius (30BC–14AD) advises that soot from pitch-pine should be collected from the walls of a specially constructed chamber, mixed with gum, and then dried in the sun. In the middle ages not only calligraphers, but also housewives had their own recipes for preparing ink which were often passed down as a family heirloom. Such a recipe might go as follows:

‘take four ounces of gum arabick, beat small, two ounces of gall beat gross. One ounce of copperas, and a quart of the comings of strong ale. Put all these together and stir them three or four times a day about – fourteen days then strein it through a cloth’ (case p.6/14).

When the writing masters (sep.169) began to publish their copy-books in the 16th and 17th centuries they often included what they claimed to be their own recipe for making ink. But not all of them were truly original; Edward Cocker (sep.173), for example, writing in the second half of the 17th century, recommends a recipe which closely follows that given by Giovanni Battista Palatino (sep.p.122) in 1540. While making one’s own ink every time one sat down to write, in the manner of Chinese calligraphers, was no doubt desirable, it was also very time-consuming and with the growth of education and commerce it became impractical; by the 16th century a new profession arose, that of the travelling inkseller (jvi p.79) who competed with stationers and other similar shops.

Ink suitable for the quill severely damaged the steel pen, one of the main problems confronting 19th-century pen makers. The first supposedly non-corrosive ink was made in the 1830s but it was not before the discovery of aniline dyes in 1856 that inks were devised which gradually eliminated these difficulties.

Islamic calligraphers have left prolific and detailed instructions about the way ink should be prepared, some of them more exotic than others. In the Maghrib (sep.p.35), for example, basic black ink was made from wood taken from a sheep’s stomach, which was shredded, put into an earthenware pot and placed over fire to scorch the wood. This was then ground to dust with a stone, water was added, and the mixture was once more heated; cooling produced a hard black which had to be diluted in water (kha:ms p.46); pellets made from this type of hard ink were useful if a calligrapher had to go on a long journey. Ink was also made of soot, honey and gum; soot from the oil lamps in the Suleymaniye mosque in Istanbul is still considered especially auspicious and full of baraka (the power of blessing). Islamic scribes used carbon as well as iron-gall inks, and sometimes an ink contained a mixture of both. Great importance was attached to producing an ink of black lustre which did not fade. The basic ingredients were usually soot, added to a heated mixture of water, salt, gum-arabic, grilled gall nuts, iron sulphate and honey; an addition of myrrh was recommended to repel insects. Islamic calligraphers also employed coloured inks to highlight passages, words, decorative marks, or decorative ornaments, though this was done sparingly and with great care as to the overall effect of the page (sep:plate viii). Apart from gold and silver, colours made of vegetable dyes such as blue, green, red, orange, yellow or violet would be used.

In the Far East ink has always been carbon-based (carbon being obtained by burning certain kinds of wood or liquid, including tungs-tree oil or lacquer). Its use for painting and, later, calligraphy goes back to archaic times,
and the name of the inventor, Cangjie, and the dates attached to him (607–2597BC) are probably just a tradition. The first documented ink maker was the calligrapher Wei Tan (172–253AD) who, as we are told, refused the ink the Emperor had bestowed on him, using instead the one he had made himself and writing much better calligraphy in consequence. His ink was supposed to be so black that, as a prince of the southern Jin dynasty (497–501AD) wrote, ‘every drop was like lacquer’. A 5th-century work on agriculture gives the recipe, under ‘methods of mixing ink’, as follows:

‘Fine and pure soot is to be pounded and strained in a jar through a sieve of thin silk. This process is to free the soot from any adhering vegetable substance so that it becomes like fine sand or dust. It is very light in weight, and great care should be taken to prevent it from being scattered around by not exposing it to the air after straining. To make one catty of ink, five ounces of the best glue must be dissolved in the juice of the bark of the qin tree which is called fengji wood in the southern part of the Yangtze Valley . . . add five egg whites, one ounce of cinnamon, and the same amount of musk, after they have been separately treated and well-strained. All these ingredients are mixed in an iron mortar; a paste, preferably dry rather than damp, is obtained after pounding thirty thousand times, or pounding more for a better quality’ (1927 p.186).

It comes as no surprise to learn that some emperors thought ink a suitable form of tribute.

Chinese ink is greatly superior to other forms of ink and especially valued for its smooth and delicately balanced colour tone. Tone is more important in the context of Chinese visual art than colour; black is capable of producing a large range of tones, all of them skilfully exploited by the calligrapher (and of course the painter). In addition, Chinese ink has a particular transparent quality; it is water proofed and does not fade with age. The ink of the inscriptions found in tombs dating from the 5th century BC has remained unchanged. According to general consent the best ink is made from the pine growing in the Yellow Mountain area, in An-Hwei province. Burned and purified soot is mixed with animal glue and then moulded into cylindrical or (more popular) rectangular block bars. Chinese ink sticks vary in size, they are frequently decorated, often used as special gifts, and they can become valuable collectors’ items (166 p.129).

Before the calligrapher can begin his work he has to prepare the ink by rubbing the ink stick against a special inkstone, while at the same time mixing it with water, carefully added from a small dripper. Grinding the ink is an important stage in the process of calligraphy. The quality of the stone (slate and silk stones are popular), the amount of water, the pressure applied while grinding, the rhythm of the movement – all these will be reflected in the quality, consistency and the all-important tone of the ink. It also gives the calligrapher time to compose himself, concentrate his mind and reflect on the planned composition before writing the first line.

Parchment and paper

Many factors influence the choice of writing material. Availability no doubt plays a decisive role (palm-leaves in India and Southeast Asia, bamboo in China) coupled with technological know-how (papyrus in Egypt). Another factor, often overlooked, is cultural predetermination. Parchment was not (in fact could not be) used much further east than Iran. Buddhists would not write their texts on the skins of slaughtered animals and to Hindus leather was a material ritually so unclean that only the lowest castes would touch it. In the West, where no such taboos existed, animal products have always been used naturally, not only for food, clothing and shelter, but also as writing material. The earliest surviving leather (skin which has undergone curing and manipulation with oil) documents come from ancient Egypt (c.2500BC), but leather, the forerunner of parchment, was also widely employed in western Asia, in what are now Iraq and Persia, and, later, also in Turkestan. When Christianity and Islam replaced Judaism and the other ‘non-book’ religious in this area, skin-based writing materials (leather and parchment) continued in use. East of Iran the situation was different. Plant products had for long been the preferred writing materials; bamboo, wood, later silk, and eventually, more or less as a natural progression, paper. Parchment and paper in turn respond best to different types of writing instruments and to different inks: in the case of parchment the pen and the iron-gall ink, and in the case of paper the brush and carbon-based inks.

PARCHMENT

An entertaining story is attached to the invention of parchment. The city of Pergamum in Asia Minor (present-day Turkey) gained considerable importance under Eumenes II (175–158BC) when, after the defeat of Antiochus the Great in 190BC the Romans greatly extended his realm. The king, a passionate book collector, used his new wealth to create a library which soon began to rival that of Alexandria. According to Pliny the Elder, King Ptolemy of Egypt, greatly resenting Eumenes’ growing reputation as a book collector, held up a cargo of papyrus which in turn prompted the latter to perfect the only freely available writing material at his disposal, namely leather, and, in consequence, invented parchment (Latin pergamentum), aptly named after the city of Pergamum.

In truth the ‘invention’ was probably the end-result of a lengthy process. By the 2nd century BC papyrus was in short supply and becoming more and more expensive. The expanding Roman Empire depended heavily on an ever-increasing amount of papyrus documents to sustain its administrative infrastructure. Greek demand too was rising. The situation was further aggra-
varied by the fact that with the disintegration of the Egyptian Empire and the deterioration of the Mediterranean trade routes, the way of life and the form of economy which had supported the large papyrus plantations in the Nile delta (the place where the plant grew plentifully) were in rapid decline. The search for a suitable and affordable substitute had become imperative.

The process by which parchment is manufactured is fairly complex. The whole skin (usually that of a sheep or goat) has to be thoroughly cleaned, treated with lime, defatted and defleshed, scraped on both sides, washed for a couple of days to remove the lime, stretched on a frame, scraped again, rubbed with pumice, treated with hot water and then dried. Some of these actions have to be repeated several times – an altogether long and labour-intensive procedure. Stretching and scraping are important: the thinner the parchment, the finer the quality (C2BE pp.11–17). In the finished product, recto and verso are clearly recognizable: the inner (flesh) part is tougher, more yellow and in general better able to retain ink; the outer (hair) part is smoother and easier to write on, but has a tendency to cause certain types of ink to flake. Vellum is produced from calf or cow skin in exactly the same manner; in general terminology all skins are referred to as parchment. Or, as William Horner wrote in the early 16th century ‘that stouffle that we write upon: and is made of breestis skynyes: is somtyme called parchment and somtyme velen.’

Parchment is exceedingly durable and fragments have survived from the 2nd century BC. It was however 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 (see p.252) began to replace the old scroll format [16] since it was no longer necessary to write on one side only; in addition, good parchment is soft and velvety and can (unlike papyrus) easily be folded. In Europe parchment remained the most popular writing material until the Middle Ages when it was gradually supplanted (for economic and practical reasons) by paper.

PAPER

According to the Chinese historian Fan Ye (307–405AD) paper was invented by Cai Lun (c.61–121AD), a eunuch at the Court of Han Emperor Wu Di, in the year 105AD. In fact Cai Lun was probably more of a supervisor than an inventor (he was charged with collecting information and reporting on the various experiments in papermaking 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. Some Chinese historians of the 6th and 12th centuries thought paper existed before the time of the Eastern Han (25–230AD), and recently paper fragments (made of hemp fibre) found in a grave at Yung-sing in the province of Shensi in northern China, which have been dated not later than 140–47BC, are indeed putting the time of the ‘invention’ back at least another 300 years.

Silk was first cultivated in China at the time of the Yellow Emperor (2640BC), the legendary Yellow Emperor whose Court Recorder is supposed to have invented writing [11]. For a long time silk was a prized export article, its production a carefully guarded Chinese monopoly and death by torture the punishment for informers. There are various stories about the way the Chinese eventually lost the monopoly. One tells about a Chinese princess who, in 140BC, was sent in marriage to Khotan; since she could not bear the thought of spending the rest of her life without her customary silk clothes she hid some mulberry seed and a few silk worms in her headdress. In 300AD the Koreans brought four Chinese girls who understood the process of silk production to Japan; and in 550AD the Byzantine Emperor Justinian persuaded two Persian monks who had lived in China to smuggle silk worms to Constantinople in the hollow of their bamboo canes.
As a writing material, silk performs well with brush and ink and a number of 4th- and 5th-century BC Chinese writers mention it in a manner which implies frequent use. Some silk fragments inscribed with Chinese characters have recently been found, dating from the 4th century BC. By the time of the Eastern Han (25-220 AD) silk was widely used for letters, literary composition and official documents. Silk was however an expensive form of writing material and around the beginning of the Christian era a method developed by which old silk rags could be pulped; the resulting mixture, thinly spread on a frame, produced a material which could justifiably be called silk paper.

Paper had, from the beginning, a considerable advantage over silk: it was much cheaper and could be manufactured by recycling waste products. According to contemporary records, paper was originally made from tree bark, fish nets and old rags. Botanists who have examined early paper fragments (from the 2nd century AD) have pronounced it a mixture of raw fibres (mulberry, laurel, waste hemp, Chinese grass) and old rags. A reconstruction of the earliest technique of papermaking would look as follows: young mulberry stems, tied into bundles, are placed for a considerable period of time into a running stream to loosen the bark; the bark is then stripped off, cut into pieces and soaked in water for up to 100 days. To separate the inner (white) bark from the outer (dark) outer one, the cut pieces are pounded in a mortar and the outer bark, being of no further use, is then discarded. (In Japan these tasks were often performed by women who would trample the mulberry stems in the freezing water before sitting down and laboriously picking off the dark outer bark piece by piece.) The remaining pulp of white

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11 A portrait of Gong Ji, the Court Recorder of the legendary Yellow Emperor (3rd millennium BC) who is traditionally credited with the invention of the Chinese script. According to the Shuo wen jie zi, the first etymological dictionary of Chinese characters, c. 220 BC, he “looked down and saw the marks left by the tracks of birds and animals. He realized that by distinguishing such patterns he was able to differentiate one thing from another. Thus he first created the script and carved letters.” A 17th-century album of export paintings from southern China.

BRITISH LIBRARY, ORIENTAL AND INDIA OFFICE COLLECTIONS, OR.2582, f.13

12 Papermaking in China: (a) Tree bark and plants are cut into pieces and soaked in water. (b) After pounding, and the separation of plant fibres, the remaining pulp is mixed with other ingredients and boiled.
bark is mixed with either lime or soda ash, heated over a fire to boiling point for at least eight days and nights, and washed until the fibres are softened. This mixture is then strained and pounded into a soft doughy substance, and bleached. The bleach is removed by further soaking and the mixture is placed in a large vat with added starch to prevent the finished sheets from sticking together. To make individual paper sheets a bamboo frame is dipped into the vat and a thin layer of the solution lifted from it; this is the most skillful part of the whole operation. The lines of the bamboo frame leave a water mark on each sheet which remains visible in the final book. The individual wet sheets have to be well dried, either in the sun (perhaps on a brick wall) or on heated wood (12 a, b, c, d, e).

Papermaking became (like silk making) a closely guarded Chinese monopoly and for about 600 years the technique was known only in China, from where it did not spread much further 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 papermaking. According to one account these men voluntarily set up papermaking shops in Samarkand; another version claims that they betrayed their secret only under torture. Whatever the truth of the story we know for certain that in the late 9th century AD the Viziers of Harun al-Rashid (786–809AD) established paper mills near Baghdad. From there the industry spread to various towns of the Middle East: Damascus, Sana’a and later Cairo became important manufacturing centres (AG p.47). The basic ingredients of Islamic paper were linen (instead of mulberry bark) and hemp. Eventually the growing demand for paper put pressure on the supply of raw materials; 'Abd al-Latif, a doctor from Baghdad who stayed in Egypt between 1190–1207 AD, tells a somewhat gruesome story about Egyptian peasants robbing graves to obtain mummy wrappings made of linen which they sold to paper factories.

Paper greatly stimulated the development of ornamental cursive handwriting in Islamic calligraphy. The demands of calligraphers encouraged papermakers to refine their product and invent a number of additional embellishments. In Persia coloured paper was already popular during the Timurid period (1336–1506 AD). Later anthologies often consisted of pages in different colours mixed with marbled as well as gold-sprinkled sheets (see Plate VIII). Such conventions spread to Mughal India and were further perfected in Turkey. The highly burnished surface, a characteristic of Islamic manuscripts, was achieved by sizing the paper with vegetable starch (or a mixture of rice powder, starch, quince kernel and egg white) and gum to fill in the pores. The surface was then burnished with a piece of stone (preferably an agate), a glass egg (in Turkey) or a broad ended pestle (Mughal India) to remove all unevenness (15).
According to tradition, paper was introduced to Japan (once again via Korea) in 610 AD by the monk Doncho and it is perhaps no accident that Japanese calligraphy becomes noticeable about a century later. During the Heian period (794–1185 AD), when the art of writing reached its zenith (see p. 124), paper production achieved a high level of sophistication. The prominence of the Court and the break from Buddhist dominance created a demand for paper: ordinary paper for official documents as well as luxuriously decorated sheets (stamped, tinted, stencilled, gilded, decorated with washi-like drawings and so forth) for writing diaries, poems and letters. Particularly fine paper was produced at the time of Emperor Heijo (reigned 806–809 AD); a paper mill in Kyoto supplied 20,000 paper sheets to the Imperial Court alone. The Heian period also had a great penchant for elegantly-coloured paper. Gentlemen carried it in the folds of their clothes, while ladies had to understand its importance and know what type of paper should be chosen for what occasion above all; it was (together with calligraphy) an important accessory in the intricate games of courtship played by fashionable society (see p. 134). During the Meiji period (1868–1912 AD), Western papermaking technology and Western typography (see p. 166) were introduced to Japan, but craftsmen papermakers (albeit in much smaller numbers) have retained their position until the present day.

Paper reached Europe a thousand years after its invention by a tortuous and not always easily verifiable route [14]. In the 12th century (perhaps even a century earlier) the Arabs introduced the art of papermaking to Spain and Sicily (and a century later to India). Rags were still the most important ingredient for its manufacture; in the laws of Alfonso X of Spain (1236 AD) paper is referred to (rather fittingly) as *paparina de paño* (cloth parchment). In 1492 the Muslims finally lost Spain and the art of papermaking passed into the hands of less skilled Christian craftsmen. But paper had already begun to establish itself firmly in the Western world. In 1336 a paper-producing factory was established in France, at Troyes; in 1330 papermaking reached Germany (Nuremberg), in 1438 Austria (Wiener Neustadt), and in 1690 America (Germantown and Philadelphia). By 1400 paper was commonly used for cheap textbooks, tracts, and small books of sermons, though it was not yet always given equal status to parchment; as late as 1450 Cambridge University ruled that only parchment books were acceptable as security for a loan (Dod p. 16). What finally established paper as the preferred writing material in the West was without doubt the rapid advent of printing (see p. 169) after the middle of the 15th century.

The manufacturing process of paper remained basically the same until the 19th century. Then, for economic reasons (the spread of general education together with the increasing needs of commerce and administration which caused a huge increase in demand), methods for manufacturing paper from wood pulp were developed. Fibre and fibre fragments were separated from the wood structure either by mechanical means, or wood was exposed to a chemical solution which dissolved and removed lignin and other wood components, leaving cellulose fibre behind. At first paper sheets were still made by hand but in 1790 a conveyor belt for making an unbroken sheet of paper was invented in France; this method was improved in England within a
decade and by the mid-19th century the whole process of making paper became mechanized [15]. The introduction of wood as a substitute for rags had guaranteed the supply of paper but irrevocably diminished its quality, durability and appearance.

Even today Chinese paper is without equal. As far as its quality is concerned it can generally be divided into two broad categories: raw (untreated) and mature. Raw paper is soft and absorbent, almost like blotting paper. For calligraphy (and painting) the best paper is xuan paper produced in the city of Xuan in the province of Anhwei. The secret of its production has for long been the property of two local families who have handed it down from generation to generation. Outsiders, especially in Japan, have repeatedly tried to imitate the process but without much success.

There are many different kinds of xuan paper, Daxuan, a thin single-layered paper, is rather porous and absorbent and encourages the ink to run fast and bleed quickly; writing is hard to control but good calligraphers appreciate its sensitivity. Fixuan, a double-layered paper, is equally absorbent but water and ink do not run so fast and the ink is easier to control. Another paper, shu shuai, is half raw and half treated. Mature paper usually has some alum added to seal the texture and make it less absorbent. Yukiao xuan is well soaked in alum and reacts more slowly to water and ink. Hubi xuan, dyed orange with a tiger skin pattern, is mainly used for writing couples for social occasions and similar events (DKJ p.126).

Other less traditional kinds of papers are Ruan bian, a paper made of straw or grass and Shu paper, made primarily from bamboo, both are half treated with alum. Gooli is a Korean paper with a heavy hemp mixture; it is strong, almost like parchment, and similar to Japanese hemp paper. If treated with alum it becomes hard and no longer absorbs water. It is mostly used for kites and for covering windows (instead of glass) but occasionally some calligraphers chose it for their work (DKJ p.129). The Western term 'rice paper', which is often used to refer generally to all Oriental paper, has in fact nothing to do with rice. Correctly used it denotes either xuan paper, or a paper made from the pith of a small tree (Araliia papirifera) which grows mainly in the swampy forests of Taiwan.

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THE THREE GREAT TRADITIONS

Western calligraphy

All Western styles of calligraphy have their roots in the Roman system of scripts used in the area of the Roman Empire between the reign of the Emperor Augustus (31 BC – 14 AD) to the papacy of Gregory the Great (580–604 AD) (MPB p.14/5). The basis of Western calligraphy is the Roman (or Latin) alphabet which appeared for the first time in Italy in inscriptions dating from the 7th or 6th centuries BC. The Roman alphabet now consists of 26 individual letter signs (for vowels and consonants), and is written from left to right – though some of the earliest examples show a right to left, or even boustrophedon (that is, from right to left and left to right alternatively) direction. Historically this form of writing can be traced back, via the Etruscan and the Greek alphabet, to the Phoenician consonant script which flourished between the 13th and the 3rd centuries BC (AG pp.91/126).

An important element in Western calligraphy is the connection between form and function: scripts, broadly speaking, are either book hands or documentary hands. The first, used foremost for the copying of literature, aimed at clarity, regularity and (to some extent) impersonality. Usually the work of professional scribes, deliberate stylization can give these hands an element of imposing beauty. Documentary styles cover a much wider range of purpose; they include chancery hands as well as the workaday writings of officials and private persons. For this type of script the ability to write quickly is of great importance, and to achieve this, the pen should be lifted as rarely as possible from the writing material. This is turn can lead to ligatures (cursive appearance), loops and an increasing number of abbreviations. At first it may seem strange that these, seemingly illegible, hands should deliberately have been chosen to communicate information vital for the economic, administrative and military well-being of a large and powerful Empire, but the contemporary standing of literacy was high (in fact that prevailing in Rome during the 1st century AD was not matched in Europe until the 19th century), and those who were literate had been carefully taught how to write and read.

Apart from form and function the development of Western and (indeed all) calligraphy is also closely connected with the materials and the instruments used for writing. In Rome, calligraphy developed with the use of parchment in the early part of the Christian era; materials such as wax and the metal stylus, or pieces of pottery, wood, or even papyrus with its more
uneven surface, had not been equally congenial. An important element was the resistance of the material to the instruments used for writing: the hard, split reed pen (calamus), and, from the 6th century AD onward the quill (penna), produced just the right combination.

Foremost in the hierarchy of the ‘Old Roman System of Scripts’ are Square Capitals; this was an imposing script of great harmony, used primarily in monumental, epigraphic inscriptions (on stone, wood and metal), and occasionally also for some of the best manuscripts, and for titles. The geometrical bases of this style are the square, the circle within the square, and the half-square [16]. The square also provides the ‘perfect number,’ namely ten; the width of the main line of each letter is supposed to measure one-tenth of its height. The finishing lines (serifs) at the top and/or foot, a by-product of the way letters were cut into stone with a chisel, accentuate the impression of overall harmony. The most used book script of this period, however, from which all Latin and vernacular handwritings of Western Europe descend, are Rustic Capitals [17], a slightly more narrow and condensed hand, better suited for the reed pen and, later, the quill. The pen, cut with a broad end and

16 With the growing importance of typography, printed creators on the technique of letter designing appeared: Damianno Boccio (480), Hartmann Schedel (1485), Fr. Luca Pacioli (1497), Francesco Tinelli (1517), Albrecht Dürer (1525), Giovanni Battista Vellali (1528), Geoffroy Tory (1529), Urban Wysa (1553). In many ways the systematic study of Western calligraphy and its recorded history begins with such works, in which very often mathematical principles were brought to bear on the structure of Roman letterforms. Western calligraphy has always been based on lettering, and with the advent of typography it was felt that the rules had to be codified to safeguard excellence. In this way the introduction of printing helped to standardize and protect fine writing. Illustration from an advertisement for Walter Koch’s book, Rhythm and Proportioning in lettering.

BY COURTESY OF MISS KATHLEEN STRANGE

17 The Vespasian Psalter, written in Rustic Capitals, copied probably in 725/730AD in St Augustine’s monastery, Canterbury.

COTTON VESP. A. S. 13
held in such a way as to ensure that the thickest stroke fell in an oblique angle to the line of writing, was held at a steeper angle and had to be lifted several times to form a single letter. Like Square Capitals it was a majuscule script with all letters of equal height, as if written between two horizontal lines; there were as yet no ligatures or abbreviations. A more informal script used for correspondence and documents was Old Roman Cursive [16], where the pen cut to a sharp point, was still held at an oblique angle but lifted less often, producing simpler, more ‘cursive’ letter forms; some had descendants beyond the body of the letter. At first used mainly for writing on wax tablets and on papyrus it eventually influenced the development of minuscule letters.

18. Book of sale of a seven-year-old boy, Syria, 24 May 1668. The script is an example of Old Roman Cursive. Many letterforms are simple cursive written capitals, but several others have changed into new forms; the text is written without punctuation and there are autograph signatures at the end.

19. Bede, Expositio in Lucam. A good example of what came to be known as the hierarchy of scripts, Rustic Capitals (for the major headings), Uncials for the first line of the Liber tertius, and Carolingian minuscule for the rest of the text: 1080, c. 828-900, with late 10th-century additions.

BODLEIAN LIBRARY, OXFORD, MS BOLEY 118, f.102
Between the 2nd and the 4th centuries AD a number of changes occurred: papyrus was replaced by parchment, and the old classical (and Hebrew) scroll format of the book by the new Christian codex. In calligraphy the rather elaborate Rustic Capitals gave way to more simplified letterforms, written with a broad pen held either obliquely or, sometimes, straight, so as to allow the thickest strokes to fall at right angles to the line of writing. This led to the development of what is called the ‘New Roman System of Scripts’ which boasts two elegant book hands: Uncia and Half-Uncial (a more rapid script produced with a straight pen). When book production (pagan as well as Christian) passed into the hands of the Christian Church, Uncial remained the favoured script of the monastic centres (especially those observing the Rule of St Benedict) until the 9th century; the originally slightly oblique pen was however replaced by a straight one which gave the hand a more rounded but slightly contrived look. The second of the two book scripts, Half-Uncial, making use of a perfectly straight pen, could be written more quickly and was generally used for less formal manuscripts. At the same time a more fluid version, Cursive Half-Uncial (going back to Literary Cursive [20]), became the common handwriting of the educated person of late Antiquity. Cursive Half-Uncial was important as a style because it stimulated the formation of the Insular system of scripts (the basic stimuli for Continental scripts being Half-Uncial and New Roman Cursive); revived later by the Humanists (see p.67) it became the inspiration for modern typefaces. In addition, from the 4th century onward, a cursive script, New Roman Cursive [21], came into use, written with a pointed pen held straight. Though basically the same as Half-Uncial, the cursive minuscule of its ligatures gave it an entirely different appearance.
In the 5th century the Roman Empire disintegrated under the onslaught of tribal insurrections which swept through Western Europe, and in 410AD Rome itself was sacked by the Goths. The civilized and highly organized way of life that had prevailed for so long came to an abrupt end, and the need for common literacy decreased. Without the Christian Church (after the Manifesto of Tolerance in 311AD Christianity became more and more dominant in the Empire), which took over the mantle of Rome, it may well have vanished altogether. Unlike the Roman religion, which had depended on outward ceremonial, Christianity is (like Islam) a 'book' religion; it possesses in the Bible the revealed and written-down basis for its existence. In the following centuries Christian missionaries began to move along the old (Roman) lines of communication, taking the Bible, the parchment codex, the quill pen, and contemporary forms of writing to the northern part of Europe. Consequently, between the 5th and the 14th centuries a number of distinct 'National Hands' developed in the various states carved from the disintegrating Empire by Ostrogoths, Visigoths, Vandals, Franks, Burgundians, Angles, Saxons, Lombards and other 'barbarians' (MPB pp.32/3). The basis for much of this development was either New Roman Cursive (for the chancery scripts of Ravenna); and for the Merovingian script [23], or Half-Uncial. This is especially noticeable in the scripts which developed in monastic centres such as Luxeuil, Bobbio and Corbie; or in the Benevento [22] region of Italy, and in