STEPPING STONES TO THE ART OF TYPOGRAPHY.¹

By THE EDITOR.

It was customary, not many years ago, to speak of printing as an invention which, Minerva like, sprang up perfect from its birth in the middle of the fifteenth century, but it has come to be realized that like every other art, and like all the great discoveries of modern science, it had to pass through all the stages of an imperfect infancy and gradual growth before it could be carried to the full flower of its development, which was reached in the latter half of the fifteenth century.

The literal meaning of the term printing is making or taking an impression, and in the light of that definition we can push back the history of this art to the time when Nature herself was printing on the pliant rocks, in the various strata of the earth's crust, representations of animals and trees, which may be regarded as a life history entombed ages before human history began, or language was born.

It may be said, therefore, that the art of printing, in its broadest aspect, is as old as Creation, and that the world possessed books long before it knew how to produce them, and to multiply them by mechanical means.

These books of Nature were the seed germs from which our modern books have evolved. Primeval man, unconsciously, was following Nature's example, when, with a pointed flint flake or a sharpened bone he scratched pictures and symbols on the walls of his cave dwelling, or, later, when he had reached a more settled state of civilization he impressed symbols and characters upon tablets and cylinders of clay, upon slabs and obelisks of stone, or upon staves and planks of wood.

But there were several links in the chain of development before the actual stage of human record was reached. Language itself was of necessity a slow development, and equally slow was the next step, for speech existed some time before man discovered that the human voice,

¹ An amplification of the lecture delivered in the John Rylands Library on the 10th February, 1927.
which informed the brain through the ear could be represented by a combination of marks and symbols, which produced the same result through the eye.

It was this stage in the development to which Aristotle referred when he said: "letters are marks of words just as words are marks of thoughts," and it was by means of this art of writing that the progress of the human race was assured.

Indeed, it may be regarded as the most important stage in the evolution of the art of printing, which has been variously described as the art of artificial, or rapid, or mechanical writing.

As we turn back the pages of history we find that in every age, as the demand for knowledge has grown, new methods for supplying it have been improvised. In the fifteenth century that growth was phenomenal, and it was found that the slow and tedious process of hand-copying, which had obtained for so long, was inadequate to meet it, so new and more rapid methods of production were developed, and slowly this mechanical writing was evolved.

In the whole history of book-production there is no more fascinating chapter than that which treats of the block-prints and block-books, which led up to that later development of the art known as typography, when movable or separate metal characters or types, which could be used again and again in a variety of combinations, were employed for the first time.

These stepping-stones to the type-printed book, which were the links connecting the manuscript method of book-production and the mechanical method of the typographer, consisted of single pictures, or collections of pictures, printed from carved or engraved slabs of wood and made up into books, which, for that reason, are described as block-prints or block-books as the case may be.

Not only were these block-prints the precursors of the type-printed book, they were, at the same time, the earliest European specimens of the wood-engraver's art, which is the art of cutting a design in relief on slabs or planks of wood in such a way that the raised parts of the original surface left standing on the block, when inked, will transfer the design to paper.

But the first definite steps towards the art of multiplying texts or pictures by these mechanical means, must be sought not in the western world but in the Near and Far East, where the ancients were employ-
ing engraved or carved stamps, seals and gems, with which to impress designs or letters upon some plastic material such as clay or wax, and from which, at a later period, they took inked impressions on papyrus, paper, and other materials, in the same way that we use a metal or rubber-stamp to-day.

As we pursue our investigations we shall discover that centuries before the western world had made acquaintance with any mechanical method of book-production, the Chinese had developed from the seal impressions the method of block-printing, which afterwards found its way into Europe, and had also evolved a system of typography.

Some authorities go back to the third millenium B.C. when the Sumerians, Babylonians, and Egyptians, and later the Greeks and the Romans, were employing seals and stamps to impress soft substances such as clay and wax with designs or characters with which to mark tablets, lamps, wine jars, and other vessels, either by way of authentication, or to indicate the names or initials of the potters, the owners, or the contents of the vessels.

In Sumeria, at least as early as 2400 B.C., seals of the temple stewards, scribes, archivists, and other officials were employed for the authentication of documents which took the form of clay tablets in the great palace temples, and of which large quantities have come down to us.

The Sumerian and Babylonian seals, like the Egyptian examples, were of amethyst, jasper, steatite, rock-crystal, lapis-lazuli, and agate, which were cut in intaglio by expert seal engravers in various forms, either on their base or around their circumference, with an ornamental device or some brief inscription, so that when rolled over, or impressed in the clay, they would leave an impression in relief. Indeed, in the ruins of the ancient buildings of Babylonia and Assyria, and in Egypt to a lesser degree, there is scarcely a kiln-burned brick without an inscription stamped upon it. One of the actual wooden stamps, fitted with an arched handle, was recently discovered in a tomb at Thebes.

The greater number of the Egyptian seals were button-shaped, and were carved to represent the scarabæus beetle standing upon an elliptical base, the under side of which was engraved in intaglio with the device or inscription to be impressed. The beetle upon which they are modelled, and from which they take the name scarab, is said to have been taken as the emblem of Khepera, the father of the gods,
consequently the scarab seals had a sacred meaning attached to them. Some of the seals are of such minute delicacy that the fineness of the workmanship can only be appreciated by the aid of a magnifying glass. The scarab seal is still used as a signet ring.

The official cylindrical seals of Egypt bore either the name of the King together with the title of the office or official, or simply the title of the official, but never his personal name.

The great seals of State were as important in ancient Egypt as in this country, and it was only by the King bestowing his own seal or one of the great seals of state upon one of his subjects that he was able to delegate his authority. From about 2000 B.C. onwards the keeper of the royal seal is constantly referred to in inscriptions. He was chancellor of the exchequer, lord chancellor, and keeper of the privy purse.

In the Biblical account of Pharaoh and Joseph we read that “Pharaoh took off his ring from his hand, and put it upon Joseph's hand... and made him ruler over all the land of Egypt.” That ceremony is proved to be a true and genuine one by a number of inscriptions, one of which relates to the appointment by Tutankhamen, in 1350 B.C., of the Chancellor.

There were sealers attached to almost all the departments of the public service, as well as to all the religious institutions of the country.

Wealthy noblemen also had sealers in their household, whose duty it was to give out from the “sealed” store rooms the provisions and other private property required by the great man or his household. One important official of the early period was the sealer of the honey jar, honey being one of the greatest of all primitive luxuries.

The storehouses of the private people were probably in the charge of the housewife or some other woman of the household. She had her little string of seals for sealing the grain and other provisions, which was the counterpart of the modern bunch of keys.

The modern wedding ring has its origin in the custom, which prevailed in Egypt, of the man presenting to his wife on her marriage a seal or seals which she was to use for sealing up her store of provisions. At first, the seals were worn around the waist or neck, later they were secured to the finger by a piece of cord or wire, which ultimately developed into the signet ring. The seal was given to the bride upon entering her new home to signify that she was the mistress of
the house. Cicero refers to this seal as the key, and in England it has been customary, when a ring is not forthcoming at the marriage ceremony, to use instead the bow of the key of the chancel door.

The method of closing and sealing the granaries and other store-rooms was by means of wooden bolts, which after being shot into position, were tied up with cords, the ends of which were sealed, so that the receptacles could not be opened until the seal was broken. It was the duty of the sealer or the state official, who was charged with the keepership of the exchequer, which consisted for the most part of the granaries, to see that the seals were affixed overnight, and to satisfy himself that they were still intact in the morning.

The Greeks also had engraved gems of great beauty which were no doubt used as seals, as well as the stamps with which they stamped signs or initials on the handles of wine jars, lamps and other vessels of domestic use. Then there were the coins of Macedonia and of the Sasanian Empire of Persia which were stamped in relief as bold as that of the best pieces of modern mints. We often speak of a coin as being a fine print in mint state.

The old Roman potters marked their manufactures with the name or initial of the owner, or of the contents of the vessel, therefore like the Greeks they were familiar with the use of movable types. But the Romans went one step further than any of the other ancient peoples already referred to by smearing their stamps or seals with a coloured paint, which when impressed on papyrus, the common writing material of those days, left upon it a coloured impression or print.

It was the custom under the Roman Empire to imprint in red, in this manner, upon papyrus documents such as deeds of sale and similar instruments, a stamp bearing the name and regnal year of the Emperor, which was called a charagma, the same word is used in Rev. xiii. 16, where the beast causeth the inhabitants to assume his mark, which has been described as "the mark of the beast," "the stigmata," or "the protective mark."

In China during the Han Dynasty which covers the period (B.C. 206-220 A.D.) corresponding to the Roman Empire, the word yin, which to-day denotes seal and print, meant to authenticate by the impression of a seal on clay. The word is defined in the Shuo-Wen: an encyclopædia compiled about
100 A.D. as: "everything that has fine marks to be impressed on something else."

The first state seal in China, of which there is any record, is that of Ts’ih Shih Huang (246-209 B.C.), which was a seal of jade called "the seal of inheritance of the Empire." Before the adoption of the seal in China, when the Emperor issued orders, he took a piece of jade or bamboo and broke it in half, handing one-half to the official to whom the order was given, retaining the other half himself, as a proof of the genuineness of the order. In like manner, when a patent of nobility was bestowed, the token was the half of a piece of jade, of which the other half was kept in the imperial possession.

The transition from the broken jade to the seal was a natural one, and may have been hastened by events which were taking place in another part of Asia. Just a hundred years before Ts’in Shih Huang’s conquests, Alexander the Great had conquered part of India, and had brought Greek culture to certain countries of Central Asia which were not far removed from the expanding borders of China, the country now called Chinese Turkestan. Evidences of this mingling of eastern and western influences were discovered by Sir Aurel Stein a few years ago in Turkestan, in the shape of a collection of documents bearing seals, the devices of which were in some cases Chinese characters, in others elephants and other Indian emblems, whilst in still others were to be found heads of Zeus, Eros, and Medusa.

With the adoption of the seal during the Han Dynasty the use of seals became steadily more common, and seal cutting came to be a fine art. The seal impressions at this time were made, like those of Sumeria and Europe, in a soft substance such as clay without any colouring matter. Later (618-907 A.D.) impressions were made not in clay, but in red ink or paint on paper, like the impressions of the Roman Imperial charagma.

These stamped seal impressions brought about the natural development of the block-print, and there is little doubt that the printing of textiles had a part in preparing the way for block-printing on paper. Whether in Asia or in Europe this printing on textiles formed a background which made the learning of the new art of printing on paper a comparative simple transition. It may have arisen from chance or because of a demand for paper with patterns printed on it for decorating walls, instead of the printed textiles used for hangings.
This practice of printing textiles in gold, silver, colour, or black is said to have been known in the East as early as the sixth century A.D. The dates assigned to European specimens, on the ground of style of drawing and the character of the ornaments employed, range from the twelfth to the fifteenth century. The wearing of estampidos was forbidden in 1234 by a sumptuary law of James I. of Spain. The process of printing these stuffs is described by Cennino Cennini in his treatise on painting, composed about 1437.

There is, however, a fundamental difference in the character of the prints on textiles, whether of silk or of cotton, and those on paper. The design on textiles were purely for ornamentation, whilst those on paper were objects of piety for edification. This is equally true whether in China, Japan, Central Asia, Egypt, or in Europe.

Before there could be any great development of block-printing, either in Europe or in the East, a plentiful supply of paper was necessary, and in Europe this could not well have been before the end of the fourteenth or the beginning of the fifteenth century.

Paper was one of the most complete of China's inventions, and it had been a fully-developed art for something like a thousand years before it set out upon its triumphal journey to the West. This westward movement prepared the way for printing, and its history is suggestive of the route by which knowledge of the art of printing travelled to us. Therefore, in order to discover the course which block-printing took, it is necessary to understand something of the history of paper.

In the dynastic records of China the date of the invention of paper is carefully recorded as 105 A.D. Ts'ai Lung is generally regarded as the inventor, and has been deified as the god of the paper makers.

In the history of the Han Dynasty, written about 470 A.D., it is stated that from the time of the invention it was used universally, and other authorities confirm the statement that its spread throughout China was very rapid. Indeed, papers of every kind, made of rags, fishing nets, hemp, plant fibres, etc., for writing, wrapping, and domestic purposes were in general use in China for a thousand years before we knew anything about it in the western world. Sir Aurel Stein, in 1904, discovered certain letters in Turkestan, in one of the ruined towers of the great wall, which were written within fifty years of the
date of the invention, upon what has proved under microscopic examination to be rag paper.

The perfected invention was passed on to the Arabs at Samarkand in the eighth century. It came about in this way: war broke out between two Turkish chieftains, in what is known as Chinese Turkestan, in 751 A.D. One of the two chieftains appealed to China for help and the other appealed to the Arabs. The Arabs succeeded in defeating the Chinese army and in driving them back, taking prisoners, among whom were some paper-makers, who taught the secret of the manufacture to their Arab captors, with the result that the manufacture grew and became for the people of Samarkand an important article of commerce.

In 793 A.D., a rival factory was set up at Baghdad, where Harun al Rashid, of "Arabian Nights" fame, introduced Chinese workmen for the starting of a paper-making plant.

The next centre was Damascus, which for several centuries was the main source of supply for Europe. This paper came to be known as charta Damascena.

It would have been quite an easy matter for the secret of paper-making to pass from Damascus into Europe, but it took quite another course passing along the North of Africa and through Egypt, with the result that Egypt, early in the eighth century, adopted the manufacture, and it steadily displaced papyrus, which had been the common writing material on that continent for at least three thousand years.

From Egypt the manufacture passed to Morocco, at Fez, about 1100, and thence to Spain, which was its first appearance in Europe. For a century the manufacture remained in the hands of Saracens, though Christians seem gradually to have learned the art as the Christian conquest advanced.

The first recorded paper-mill in Christendom was set up in 1189 at Hérault, on the French side of the Pyrenees, although for still another century Europe's needs were largely supplied from the Saracen Mills of Damascus and Spain.

It may be said, therefore, that paper-making was a Chinese monopoly for the first six hundred years of its history, a monopoly which was only broken down by the conquering Arabs, who learned the secret from the Chinese prisoners at Samarkand. For the next five hundred
years it was an Arab monopoly in the West, until they in turn taught the art to their conquerors in Spain.

Meanwhile, paper was being imported into Europe by two other routes. Paper from Damascus was becoming an important article of commerce chiefly through Constantinople, and paper from Africa was entering through Sicily. It was probably by the latter route that the manufacture penetrated Italy in 1276, when the first mill was set up at Montefano. The manufacture spread rapidly, and in the fourteenth century Italy soon rivalled, and then outstripped, Spain and Damascus as the source of Europe's supply.

In Germany the use of paper increased steadily during the fourteenth century, but it was not of native manufacture being imported principally from Italy. Towards the end of the fourteenth century South Germany was receiving its supplies from Venice and Milan, and the Rhineland from France, although the supply from Damascus had not altogether ceased. Nuremberg was the first place in Germany to set up a mill, and that was not done until 1391.

England obtained her supplies from France, Italy, and Germany down to 1494, when the first mill was established at Hereford by John Tate.

It was the coming of paper that made the development of printing possible, and it was the development of printing that made the use of paper general.

As soon as Europe began to print, first from blocks and then from movable types, paper rapidly took its place as the principal material for writing as well as for printing, although the first paper mill in England was not set up until seventeen years after Caxton began to print in this country.

It is impossible to say with any degree of accuracy when the transition from clay and wax seal impressions to paper and ink impressions took place. This may be said, however, that the same impulse appears to have been behind these early examples of printing, whether in China, in Egypt, or in Europe. The languages were different, the religions were different, but they all represent the effort of the common man to get into his hands a bit of the sacred word, or a sacred picture, which he believed to possess supernatural power, but which he could not himself write or paint, and which he could not afford to buy unless
reproduced for him by some less costly or laborious process. In all these countries printing was the same in its beginning, and it is possible that nothing would have been heard of block-printing if there had been no further development of the art.

In every advance that printing made in new territory its motive was the expansion of religion. From its beginnings in China down to the present day, there is scarcely a language or a country in which the first printing executed has not been from the sacred scriptures, or the sacred art of one of the world's great religions.

China began by printing Buddhist pictures and texts. Japan had been printing for six centuries before she produced or attempted to print anything but Buddhist sacred art. In Central Asia, down to the time of the Mongol conquest, the mass of printed literature consisted of Buddhist books. In Egypt the printing that was going on throughout the time of the Crusades consisted of verses of the Ku'rrän and prayers. In Europe the block-printers produced biblical pictures, whilst Gutenberg's first important book was a Bible.

Turning back to China we find that the earliest block-printing of which we have clear proof consists of Buddhist charms, woodcuts, and books. It seems likely that the Taoists, in their desire for charms, developed the seal impression into something closely resembling a block-print, even earlier than the Buddhists. These Taoist charms consisted of seals several inches square inscribed with the name of Lao-tzü, or some other worthy.

These charm makers loved the red ink of cinnabar (red oxide of mercury mined in the province of Kweichow), and when it came into vogue for authenticating written imperial documents, there is reason to believe that they dipped their seals, made of datewood, in the red ink, and took impressions on paper.

Another form of printing, which seems to have been practised in China from the second century, consisted of inked rubbings or squeezes from stone inscriptions, which may have led the way to inked impressions from wood. The practice of cutting in stone the text of the six Confucian classics, in order to secure permanence and accuracy, goes back to the year 175 A.D. This corrected text of the canonical works of the sages, on engraved stones, was set up outside the gates of the state academy, so that scholars and students might have access to a standard text. It is
supposed that the copies made were in the form of rubbings, in which case this form of printing goes back to the second century, but hitherto no proof of these early rubbings has been forthcoming.

These rubbings ultimately served as the model for the printing of the classics, but the earliest date which can be fixed with certainty is between 627 and 694 A.D., in the reign of T'ai Tsang, from whose reign one such rubbing survives.

It may be said, therefore, that the exact date at which true block-printing began is shrouded in mystery. Hitherto, the first definite date accepted and handed down is contained in the statement made by Stanislaus Julian in 1847, on the authority of a Chinese encyclopædia, in which it is stated that: “under the Emperor Wên-ti of the Sui dynasty in the year 593 A.D., the 8th day of the 12th month it was decreed that all neglected pictures, images, and scattered texts were to be carved and collected. This is the beginning of printed books.” This statement has found its way into almost every account of the beginnings of printing that has been written in European languages, but it is now called into question by Professor Carter and other authorities. Julian, it appears, was quoting from an encyclopædia printed in 1735, in which the statement is quoted from another authority of the sixteenth century, named Lu Shên, who in turn drew his information from another work written in the year 597 A.D., only four years after the event recorded. It is now pointed out that the last sentence: “This is the beginning of printed books” is not a quotation from the original authority, but an interpolated comment added by Lu Shên in the sixteenth century.

The whole passage has since been submitted to a critical examination, which leaves little doubt that printing was not referred to at all, and that the true interpretation of the statement is that damaged images were recarved and the scattered sutras or texts were collected. In confirmation of this view several Chinese authorities are quoted, dating from the eleventh and twelfth centuries, who declare that: “Before the T’ang dynasty (618-907) all books were manuscript, the art of printing not being in existence.” Another authority says: “There was no printing before the T’ang dynasty. Inked blocks were first used at I-chou at the end of the T’ang dynasty.” Yet another authority states: “According to the popular report the cutting of blocks and printing of books from them was commenced by Fêng Tao (881-954).
The earliest well-defined block-print extant dates from 770 A.D., and comes from Japan. It is to the zeal for Buddhism of the Japanese Empress Shotoku that the world owes this first certain and clearly attested record of printing with wooden blocks on paper. This Empress who reigned with interruptions from 748 to 769 A.D., ordered the printing of one million charms, to be placed in one million tiny wooden pagodas, and it was sometime about the year 770 A.D. that the work was finished, and the charms distributed. These charms were in the Sanskrit language, but in Chinese character. They were deposited in various temples, where many of them still survive. Three of the charms (plate I), measuring about eighteen inches long by two inches wide, are now in the possession of the British Museum.

The earliest printed book extant comes from China, and is dated 868. It was found by Sir Aurel Stein in 1907 in Turkestan, and is known as "The Diamond Sutra," which is a section of the Buddhist Scriptures in roll form (plate 2). It consists of a number of discourses of Buddha to his aged disciple Subhuti; on the subject of the non-existence of all things. While it is taken up in the main by very abstruse teaching, the author has a very high opinion of the importance of the book he is writing. Again and again the Buddha is represented as describing to Subhuti the infinite merit and rewards to be gained by them who transcribe the book and thus spreads abroad its doctrine. The transcription of this sacred text became a favourite method of acquiring merit among Buddhists, and so it still remains. It is easy to imagine, says Dr. Carter, the pious delight of Wang Chien in the new invention which enabled him to transcribe not five copies but a multitude of copies for free distribution, in order to do honour to his parents.

The book consists of six sheets of text, each two and a half feet long by a foot broad, indicating the size of the blocks employed, and a shorter sheet with a woodcut of excellent technique and beauty, which is less crude than any of the early western block-prints. These sheets are pasted neatly together so as to form one continuous roll of sixteen feet in length. At the end, printed in the text, is the statement that the book was printed on May 11, 868, by Wang Chien, for general distribution, in order, in deep reverence, to perpetuate the memory of his mother.
The British Museum


I—Buddhist Charms in the Sanskrit Language, but Printed in Chinese Characters, About 770 A.D., from the Copy in the British Museum.
With the early printers "The Diamond Sutra" was a favourite book, and the excellent technique of the woodcut shows that it is not a primitive bit of printing, but that there must have been a long evolution behind it, which, in reality, is not inconsistent with the acceptance of the Wên-tî date.

Hitherto, except for the rubbings or squeezes taken from the stone inscriptions of the Confucian classics, such block-printing as we have referred to was of Buddhist texts and pictures.

The first non-Buddhist printing, in the form of a complete block-printed edition of the Nine Confucian Classics and their commentaries, in one hundred and thirty volumes, was presented to the Emperor in 953 A.D. The work of editing had been carried out at the National Academy, where the leading scholars of the Empire were gathered together to revise and establish the text of the classics. The prime mover in this project was Fêng Tao who was prime minister under four of what are known as the Five Dynasties, extending from 907 to 960 A.D. In 932 he presented to the reigning Emperor a memorial praying that the Confucian classics should be revised and cut in wood and published. It was not the new method of printing that Fêng Tao was interested in. That was a mere detail. His anxiety, and that of his associates, was to have the canon, and correct text of the classics, fixed for ever. The cutting on wood rather than on stone appears to have been a makeshift. The impoverished state having no money with which to have the text cut in stone, as previous dynasties had done, led them to adopt the cheaper method.

The work of editing and printing extended over twenty-one years, which were years of civil war, but the scholars entrusted with the work continued it quite unruffled by the storm that was beating around them, with the result that in the year 953 this great project was completed in one hundred and thirty volumes. The chief purpose of this scheme was not to make literature more accessible to the masses, but rather to authenticate the text. In this way the old idea of authentication clung to the word yin.

The progress of printing in China from this time was very rapid, and in confirmation of this statement it needs only to be pointed out that the whole of the Buddhist canon, usually known as the "Tripitaka," which consists of 1521 separate works in more than five thousand
volumes, covering 130,000 pages, requiring the cutting of 130,000 blocks was carried through as early as 972.

Thus for several hundred years before block-printing was known and practised in Europe all Eastern Asia was printing, and in many parts on a large scale.

Curiously enough, between the Far East that printed, and Europe where printing was unknown, lay the Moslem world that refused to spread its literature in printed form.

As we look back it appears singular that such a religious and literary people as the Arabs, whose culture so profoundly influenced Europe, should refuse to employ this valuable vehicle for the spreading abroad of their religious thought. With them paper, from its introduction in the eighth century, very soon displaced other writing materials, but printing was taboo. This was due no doubt to prejudice and conservatism. The Kur'an rested upon written tradition and must be handed down in no other way. Whatever may be the reason the Kur'an has never been printed in any Muhammadan country except by lithography.

It is said, that until 1825, when the first press was set up in Cairo, the Islamic world never printed a book, except for an abortive attempt made in Constantinople in 1729. This statement would have remained unchallenged but for the discovery in Egypt, in 1880, in the Fayuum, near the Crocodile City, of great quantities of fragments of papyrus, vellum, and paper, said to number a hundred thousand sheets. These documents are in ten languages and range in date from the fourteenth century B.C. to the fourteenth century A.D., and include some fifty examples of block-printing ranging, according to Ritter von Karabacek, from the tenth to the middle of the fourteenth century, consisting of prayers, texts from the Kur'an and protective charms, some of which are decorated with a geometrical design or ornamentation, conforming to the Muhammadan prohibition against pictures. Here, then, was printing going on under a culture and religion that has always been known for its hostility to printing.

It was on account of this Islamic barrier that Medieval Europe knew almost as little of China as it knew of America.

In the early part of the thirteenth century Jinghis Khan and his Mongol hordes broke through this barrier, and for a short time
Europe and China stood face to face. As a result, the contact between the Far East and Europe was far closer during the century between the middle thirteenth and the middle fourteenth than ever before, and probably closer than at any subsequent period down to the middle of the nineteenth century.

Almost the whole continent of Asia and much of European Russia was under the rule of the Mongols. Great highways were built, and armies mounted on fast horses were constantly passing to and fro, opening the way for trade.

It must not be supposed, however, that until the coming of the Mongols there was little or no communication between China and the Western World, for silk which was one of the first, if not actually the first of China's great gifts to the West, was reaching Europe for some centuries before the Christian era.

Imperial Rome was in need of silk and China possessed it. This, no doubt, was the key to the development of the great caravan route that crossed Turkestan, Persia, and Syria and reached the Mediterranean at the ports of Phcenicia and Palestine. This was the great silk route, and it is not improbable that it was the route along which the art of printing made its way into Europe.

The first embassy from the West to China, of which we have any record, was in 166 A.D., when silk was the chief article of export from the Eastern empire. According to the Chinese annals these envoys were from the Emperor "An Tun," who has been identified with the Emperor Marcus Aurelius Antoninus.

The process of silk culture was kept a profound secret by the Chinese. By Roman writers silk was thought to be a vegetable product, and Vergil describes it as being combed from trees.

During the classical period silk passed into Rome in ever increasing quantities, and continued to pass into Constantinople after Rome had fallen. But the route through Persia was closed by the Sasanians in fear of the fast growing Turkish kingdom which was, at that time, first heard of in Western history. The Emperor Justinian (527-565 A.D.) tried to persuade the Persians to reopen the route, but failing in his endeavour, he entered into an alliance with the Khan of the Turks in 568, for the resumption of the silk trade. In the meantime, some Nestorian priests returning from the East had brought to
Justinian the astounding news that silk was not combed from trees, but was produced by caterpillars, whose eggs they believed they could obtain. With the Emperor's encouragement they proceeded to the Kingdom of Khotan, in Chinese Turkestan, where silk culture had been introduced in 419, by a Chinese princess. They obtained a supply of silkworms' eggs, and in order to avoid detection the eggs were hidden in the long bamboo staff carried by one of the priests. From these eggs, if the story told by the Greek historians Theophanes and Procopius can be credited, are descended all the silkworms reared in Europe down to the present time. But it was not until the Crusades that the art of silk culture became known in Western Europe. It was first introduced into Italy in the thirteenth century, and into France in the fourteenth century.

The question: "How did printing ultimately come into Europe?" is still a matter of speculation. This, however, may be said, that by piecing together the various statements that have been handed down, and the circumstantial evidence which we find scattered up and down the records of travels and trade missions, we can arrive at a fairly accurate idea of how the influence of the block-printing of China entered Europe during the time of the Mongol Empire, and had its part in bringing about the use and development of that activity which in turn paved the way for Gutenberg's invention.

The earliest reference to Chinese printing, in European literature, is the statement made by Jovius in 1550, that it came into Europe from China by way of Russia. The one traveller in Central Asia and China to give such a clear account of his travels as to make a deep impression on Europe was Marco Polo. For this reason a great many things that have come from China to Europe have been credited to him, and block-printing is no exception. One story is told of a certain Pamfilio Castaldi of Feltre, a block-printer at the end of the fourteenth century, that he had learned his art from seeing some pieces of wood that Marco Polo brought back to Venice, which had served for printing books. But there is no evidence in support of the story. Marco Polo himself never mentions printing in his description of China.

In Europe, as in China, the motive or impulse behind printing seems to have been the same, the expansion of religion, and there is
little doubt that the first men in mediaeval Europe to take an active interest in this method of multiplying by mechanical means the religious pictures, by the aid of which the Bible story was being conveyed to the illiterate, were members of the religious orders.

The first missionary sent by the Pope (Boniface VIII.) to China in 1294, was John of Monte Corvino, who, in 1305, sent home to Rome a report of his work, which among other things included the preparation of six pictures representing scenes from the Old and New Testament for the instruction of the ignorant, with explanations in Latin, Tarsic, and Persian. In 1307, the Pope raised John to the dignity of Archbishop, and sent three Franciscans with the rank of bishop to assist him.

These and other missionaries working in China must have come into contact with printed literature at every turn. Whether they were responsible in any way for the introduction of this art into Europe it is impossible to say, but it is at least significant that within the half-century after they had laid down their work religious prints began to appear in Europe.

Although there is no record to show that knowledge of the art of printing was brought from China in the wake of trade, it is not without significance that in the first half of the fourteenth century traders and travellers were constantly passing between Europe and China, and obviously in such numbers as to justify the preparation in 1340, by Pergalotti of Florence, of a handbook in the nature of a trade guide to the various ports of the world. That printing was being practised in Persia at this time is proved by the existence of printed paper money issued at Tabriz, the Mongol capital of that country, with whom the Venetians and the Genoese enjoyed trading privileges.

It was in this first quarter of the fourteenth century that Rashid-Eddin, a man of broad education, who was prime minister to the greatest of the Mongol emperors, Ghazan Khan, was entrusted with the preparation of a history of the Mongol Empire. This was followed later by a history of the world completed in the year 1310, in which there is a section dealing with China, containing a clear description of Chinese block-printing, from what was evidently a reliable source of information. This chronicle was a widely read book, and could not have failed to spread abroad the idea of mechanically producing books by this method.
The Mongol power collapsed during the middle decades of the fourteenth century, and in the following half-century block-printing made its appearance in Europe, but there is no evidence to show by which of the many routes it entered this continent.

At this stage of our study it may not be out of place to give some particulars of the methods employed by the block-printers in China, and of the character of the books so produced, which in many respects continue until to-day.

It is true that movable type was a development of the eleventh century in China, when a man of cotton, meaning a man of the common people, named Pi Shêng, discovered how to make types of baked clay. A full description of this discovery, and of the method of setting has come down to us, but it is not my intention to enter into these details here. It may be said, however, that type was never extensively used in China. The Chinese never developed an alphabet, and since they have something like 40,000 different characters in their language this multiplicity of characters rendered the process of typesetting a very difficult process, and it was quicker to hack out a document on a block than to set it in type. It will be realised how difficult was the process of type-setting in China, when it is explained that the smallest fount of Chinese characters generally sold contains 6000 different types, and this would suffice only for the most ordinary kind of work. A well-equipped press would require founts of some 10,000 types.

The high-water mark of block-printing in China was reached during the Sung Dynasty (960-1280). The T'ang Dynasty (618-907) had been a time of rapidly extending frontiers and of contact with the lands of the West, a period of freshness and youth, an era of lyric poetry and religious faith. The Sung Dynasty, shut out from the West by the steadily encroaching nomads, was a time of ripe maturity. Lyric poetry gave way to learned prose, to great compendiums of history, to works on natural science and political economy of a character and quality such as neither China nor the West, except for a short period in Greece, had ever dreamed of. Religious faith gave way to philosophic speculation, and the great systems of thought were produced, which have dominated China to this day. In art, the lofty tradition of the earlier period was carried on and brought to fruition, so that the greatest and best Chinese paintings now extant belong to the period of the
Sungs. In invention, what the T'ang period conceived, the Sung era put to practical use. For example: the magnetic needle probably used in early times as a toy was applied to navigation, whilst gunpowder already known and used for pyrotechnic displays, was, during the Sung Dynasty, applied to war.

A similar development took place in printing. From an obscure Buddhist art at the end of the T'ang Dynasty, it was already making rapid strides during the half-century of interregnum or disruption. Feng Tao's classics were published only seven years (in 953) before the first Sung emperor ascended the throne, and it was not until the dynasty had become established that his work bore fruit.

The printing of the classics was one of the forces which restored Confucian literature and teaching to the place in national and popular regard that it had held before the advent of Buddhism, and the classical renaissance that followed can only be compared with the renaissance in Europe after the rediscovery of classical literature.

In quality, the block-printing of the Sung Dynasty has never been surpassed. The craftsmen were artists who reproduced in print very beautiful calligraphy, and in so doing set up a standard for all time. The importance of the work of the calligrapher, who prepared the copy of the work for the cutter, is shown by the fact that his name is recorded in the colophon along with those of the author and printer.

To give some idea of the magnitude of the work produced during the Sung Dynasty, it needs only to be stated that one important work was a voluminous commentary on the classics which filled no fewer than one hundred and eighty volumes. Another monumental work in many hundreds of volumes, the printing of which occupied nearly seventy years, consisted of the great dynastic histories, which was carried to a successful completion by the end of the tenth century.

This rapid printing of all sorts of books naturally made them think of improved methods of production. The first of these appears to have been the use of metal blocks of bronze, on which the characters were cut in relief and not in intaglio. It is impossible to say how extensively such plates were used, but there are allusions to plates of bronze which were distributed about the Empire during the Sung Dynasty, about 976, just prior to Pi Shêng's invention.

These were national undertakings, but side by side with them private printing was gaining ground, and spreading through the Empire.
Even in the private printing offices nothing was printed that was not considered to be of great worth and dignity. It was not until Mongol times (1280-1368) that the scope of literature was so broadened as to admit the novel and the drama, probably a reflection of Persian influence. The novel and the drama at that time was considered to be almost vulgar literature, if indeed the term literature could be applied to them at all.

There was, and still is, in China a sacredness surrounding the written word which impels men, as a pious act, to gather and burn printed scraps of paper, and thus to save them from being defiled.

The material employed for the blocks was generally a soft wood such as pear or apple tree. The wooden plank was squared to the shape and dimensions required. The surface was then rubbed over with paste or size made of boiled rice.

The text or picture was finely transcribed or drawn on thin transparent paper, which was pasted face down, and so inverted, on to the block. Such was the thinness of the paper that the lines of the text or picture shone through. The block-cutter then hacked away that portion of the surface which was not covered by ink, leaving the characters or pictures in high relief. The block was then covered with a thin watery ink and the impression was taken by placing a sheet of paper on the inked surface and pressing it down by rubbing the back with a brush or frotton. So expert and expeditious are the Chinese block printers that it is possible for one man to take off two thousand copies a day.

The block was generally of sufficient size to provide for two pages of text. The paper being thin it was only printed on one side, so that each sheet gave two printed pages, which were folded back so as to bring the blank sides in inward contact. The fold being at the outer edge of the book the sheets were stitched together in that order.

Chinese ink was made by placing a number of well-lighted wicks in a vessel full of oil, over which a dome or funnel-like cover of iron was placed. When this was well coated with lamp black, the black was brushed off and collected on paper. It was then well mixed in a mortar with a solution of gum and reduced to the consistency of a paste, which was put into little moulds and allowed to harden. The best ink was produced from the burning of particular oils, but the common and cheaper kinds were
produced from fir wood. To prepare ink for writing it was rubbed in water on a smooth stone.

The ink used in block-printing whether in China, Asia, Egypt, or Europe, was practically uniform.

Chinese ink is not satisfactory for taking impressions on metal, because it stands in globules on the metal surface, and makes a rough impression. The first typographers of Europe with their metal types, were faced with this problem, which they solved by using an ink whose pigment was dissolved in oil.

When we turn to the history of block-printing in Europe, we find there is considerable uncertainty as to whether religious pictures or playing cards were the first objects upon which the wood-cutter practised his art. There is little doubt, however, that both sorts of printing were very closely connected, and that they were often carried on side by side by the same persons.

Although it is impossible to confirm the suggestion that playing cards coming from China brought block-printing with them to the West, there is evidence at least sufficient to suggest that they hold an important place in the entry of this art into Europe.

That being the case, it may assist us in our study to enquire as to what is known of the history of playing cards, which belong to a group of games, having dice as their background, that spread over a considerable part of Asia before the time of the Crusades.

Plutarch is responsible for the statement that dice were an early invention of the Egyptians acknowledged as such by the Egyptians themselves, since they were introduced into one of their oldest mythological fables, in which Mercury is represented as playing at dice with the Moon, previous to the birth of Osiris, and winning from her the five days of the epact which were added to complete the 365 days of the year. From Egypt they spread throughout the Roman Empire, and found their way into China early in the Christian era. The earliest reference to their presence in the Far East, however, is from the year 501 B.C., when, says tradition, Lao-tzü brought back the game from the Western barbarians.

There is little doubt that both cards and dominoes originated in China, but it is not possible to say when the transition from dice to cards took place.
The earliest forms of cards were called sheet dice, and they began to appear according to one authority as early as the T'ang Dynasty (618-907). During the Sung Dynasty (960-1280) they continued to be printed on cards, but they were also made of ivory and bone, and may be regarded as the earliest form of dominoes. Later, they developed into more complicated forms, one of which has found its way to the West under the name of Mah Jongg. Immediately after the Mongol period (1280-1386) cards began to appear in Europe, and were recognised as of Eastern origin.

The earliest reference to playing-cards in Europe is that which relates to St. Louis of France, who, upon his return from the Crusades, in 1254, found his dominions given up to the vice of card-playing, and prohibited their further use.

The earliest authentic reference for their introduction into any part of Germany is 1377. There, as in other parts of Europe, the vice of gambling became so rife towards the close of the fourteenth century, that cards were prohibited in many places, notably at Nuremberg between 1380 and 1384, at Ulm in 1397, and at Augsburg in 1400, 1403, and 1406. At Nordlingen, card playing continued to be illegal until 1440.

In Paris card-playing became so popular that on the 22nd of January, 1397, the Provost of the city issued a decree forbidding working people to play at tennis, bowls, dice, cards, or ninepins on working days. The Synod of Langres also found it necessary, in 1404, to forbid the clergy to play cards.

A climax seems to have been reached in May, 1423, if the story related by Schreiber is to be believed, when Saint Bernardino of Siena preached a famous sermon from the steps of St. Peter's at Rome against card-playing. The saint, according to the story, preached with such effect that his hearers rushed to their houses, brought back such cards and games of hazard as they possessed to the public square, where they were burnt. Whereupon, one card maker, who felt that his business had been ruined by the sermon, went in tears to the saint. Father, said he, I am a card maker and know no other trade. You have forbidden me to make cards, and have condemned me and my family to die of starvation. Said St. Bernardino: If you know how to paint, paint this image, showing him the image of Christ with the monogram "I.H.S" in the centre of a halo of glory.
The source of the story is not given, but it is of interest as having
given rise to the suggestion that religious prints were intended as a
corrective, which counteracted the vice of card-playing. These attacks
upon the popular pastime were without any permanent effect, for at
the end of the fifteenth century playing cards were more popular
than ever.

Without doubt the earliest of these cards were painted and not
printed, for in the archives, guild-books, and registers of such towns as
Nuremberg, Augsburg, and Ulm, there are references to card-makers,
who are always described as kartenmacher, or kartenmaler, never
as kartendrucker.

Yet when we consider the enormous popularity of cards at the end
of the fourteenth century, and the fact recorded by Felix Fabri in his
“Descrip~tio Sueviae” that they were manufactured in great quantities at
Ulm and were exported to Italy, Sicily, and the farthest isles of the sea,
it seems highly probable that some mechanical process of making them
was introduced quite early, whether by means of stencils, as has been
suggested, or otherwise. Even so, it remains to be said that there is
no evidence of the existence of printed cards before 1441, the year
when the Signoria of Venice were persuaded by the local manufacturers
to place an embargo on the importation of foreign printed pictures and
cards. The earliest extant examples of printed playing cards seem to be
no older than 1460.

Religious pictures of a much earlier date have been preserved in
considerable quantities. They were produced chiefly for
distribution to the pilgrims at the popular shrines in the RELIGIOUS
centre of Europe.

The practice of going on pilgrimage was very frequent in the four-
teenth century and received a great accession of popularity, when
Pope Boniface IX. (1389-1404) extended the privilege of granting
indulgences to places of pilgrimage other than the basilicas of Rome.
Cologne and Munich were the first places in Germany to receive the
privilege, and the grants were continued by succeeding Popes, with
the result that a great many pilgrims journeyed to these favoured
sanctuaries.

These block-prints given or sold to the pilgrims were of a limited
range of subjects, which consisted of a number of popular saints such as
St. Anthony, St. Bridget, St. Christopher, St. George, St. Andrew,
St. Jerome, and St. Sebastian, with a number of biblical subjects such as the Annunciation, the Nativity, the Crucifixion, and other scenes of the Passion. These formed the stock-in-trade of the religious houses of the first half of the fifteenth century.

These little pictures were known in German as heiligen, or in the Swabian dialect as helgen. Here again, the earliest makers of these pictures were described as heiligenmaler, and it was not until a later date that they were known in Germany as heiligendrucker, or in the Netherlands as heyligeprenter.

The pilgrims returning from the various shrines carried these pictures home and pasted them into their books of devotion, when they possessed such treasured volumes, or they put them up on the walls of their dwellings, such as they were, and in doing so they took the first step towards bringing one of the attractions of the church within reach of the domestic circle. It was the erection of a private shrine.

They were very crude at first, consisting of figures or pictures copied no doubt from illuminated manuscripts, enamels, or ivories. They were printed in outline and were intended to be filled in with colour by hand. Whilst many of them are very crude, others are of great artistic merit. This high artistic merit is exceptional rather than common, yet the craftsmen often possessed a gift for dramatic presentation and in some cases of a true instinct for beautiful and expressive line. Much of the charm depends upon the application of colour to the native black and white. This may be harmonious or garish, and in many cases it was the latter.

At first they do not appear to have been common articles of trade made for sale by professional woodcutters. More probably they were the work of the monks themselves or of the lay craftsmen dependent on the monasteries. The production of these prints continued throughout the fifteenth century, and it is thought that a guild of craftsmen grew up who sold the blocks to the religious houses with the necessary supply of paper and other material to enable them to make prints. Indeed, there is evidence that heads of religious establishments were in possession of such sets. In the inventory of Jean de Hinsburg, Bishop of Liège (1418-1455) are noticed: "unum instrumentum ad impri- mendas scripturas et ymagines," and "Novem printe ligneae ad impri- mendas ymagines cum quatuordecim allis lapideis printis." In fact
3.—The Block-print of "St. Antony the Hermit," in the John Rylands Library
4.—The Block-print of "St. Bridget of Sweden," in the John Rylands Library
there are woodcuts known which bear the name and arms of a convent.

Schreiber quotes a passage from Martin Luther's "An den christlicher Adel," in which he complains that the Pope lets convents remain empty, and only puts in a monk to say mass and sell pictures.

The dates assigned to the known examples are on the grounds of style, in comparison with the drawings contained in manuscripts, or with pictures.

The earliest of the religious prints which have come down to us have no textual or descriptive matter of any kind upon them, and it has been suggested that there was possibly a still earlier stage, of which no example has hitherto been discovered, when the subject of the picture was of a purely conventional type, without any distinguishing features, which could be made to do duty for any saint.

We are on firmer ground when we come to the figures which are furnished with symbols having reference to some outstanding incidents in the life of the particular saint represented, by which he may be identified, although as yet they have no textual matter upon them.

The St. Anthony print (plate 3) illustrates this stage. St. Anthony was hermit, abbot, and patriarch of the monks in the first half of the fourth century. He is represented with a nimbus, and as carrying in his hand a staff shaped like a T, from one arm of which a bell is suspended. This refers to his sermons on the virtue of the Cross, and the chasing away of the demons by the ringing of the bell. The little pig at his side symbolises the spirit of impurity, which had tempted St. Anthony, and by him had been overcome. On either side is a man in the act of invoking his help, whilst beneath his feet are flames symbolizing a disease known as "ignis infernalis," or "feu d'Antoine" which raged in the thirteenth and fourteenth centuries.

The succeeding stage is represented by St. Bridget (plate 4), which in addition to the distinguishing symbols has a textual inscription in the form of an invocation. St. Bridget was a princess of Sweden (1302-1373) who was canonized in 1391. The small picture of the Virgin and Child in the top left-hand corner refers to the pious widow writing an account of her visions and revelations, in which she is said to have been frequently favoured with the appearance of the Blessed Virgin. The pilgrim's hat and staff and scrip probably allude to her pilgrimage.
to Jerusalem, which she was induced to make in consequence of a vision. The shield bearing the letters S.P.Q.R. denote the place (Rome) where she saw the vision and where she died. The Arms of Sweden and the crown at her feet are most likely intended to denote that she was a princess of the blood royal of Sweden. The most significant feature in the print, are the words above the figure of the saint, which are an invocation to St. Bridget:

"obrigita bit got fir uns"

"O Bridget pray to God for us."

Very few actual dates occur on prints of the first half of the fifteenth century, and in several instances where such dates do occur they are believed to refer to some historical event, rather than to the year in which they were produced. The earliest date which occurs on any print is 1384, but that date refers to a miracle which is said to have taken place in that year, whilst the print was probably executed a century later.

In the Royal Library at Brussels is preserved a very famous print of the Madonna and the Infant Saviour surrounded by St. Barbara, St. Catharine, St. Veronica, and St. Margaret, bearing the date 1418. But the genuineness of this date has been seriously challenged. It has been alleged that the Roman numerals forming the date have been tampered with, and that from the evidence of the treatment of the draper, the execution cannot be assigned to a date earlier than 1460.

The next date is 1423, which is found on a print of St. Christopher (plate 5) of which the only known copy is preserved in the John Rylands Library. It is regarded as the earliest surviving dated print executed in the Western world. The date is considered to be indisputable by the principal authorities, although there are those amongst them who doubt whether 1423 is the date of execution. Dr. Lippmann has published a defence in every sense of the genuineness of the date as a result of a very close examination of the print and of the colouring.

The print owes its preservation to the fact that it has been pasted on the inner side of the right-hand board of the original binding, which is of oak covered with undressed deer skin, of a Latin manuscript entitled "Laus Virginis," containing lections and offices of the B.V.M.
5. The Block-print of "St. Christopher," 1423, in the John Rylands Library
6.—The Block-print of "The Annunciation," in the John Rylands Library
The manuscript was written in the Carthusian House, which is one of the oldest convents in Germany, and is situated at Buxheim, in Memmingen, in Swabia, within fifty miles of the city of Augsburg, where in 1418, the first mention of a kartenmacher occurs. In the manuscript itself is a note stating that it was written in 1417, together with another note to the effect that the volume was given to the convent by Anna, daughter of Stephen, baron of Gundelfingen, a countess of Büchow, who was living in 1427, where it remained until the latter part of the eighteenth century, when it was acquired by Baron Heinecken, an unwearying collector of old woodcuts and block-books, who published an account of his collection, under the title "Idée générale d’une collection complete d’estampes," in 1771.

The print measures 11\(\frac{1}{4}\) inches high by 8\(\frac{1}{2}\) inches wide. The design is far superior to the earlier prints already described, and many of the cuts found in the early type printed books. The figures of the Saint, and of the youthful Christ he bears upon his shoulders, are designed in such a style that they would scarcely discredit Dürer. The whole treatment of the subject seems to breathe of the East, as though it had been suggested from some Chinese model. The saint carries a palm-tree as his staff, while the treatment of the water is distinctively Chinese, and the perspective of the scene, or the absence of it, points to the same influence.

To the left of the picture the artist has introduced, with a noble disregard of perspective, a bit of nature. In the foreground a figure is seen driving an ass loaded with a sack towards an overshot water mill, while up a steep path the miller is seen carrying a sack from the back-door of the mill towards a cottage. To the right is a hermit, known by the bell over the entrance to his cell, holding a lantern to direct St. Christopher, as he crosses the stream.

The two lines at the foot of the print read:—

"Cristofori faciem die quacumq tueris - ; - millesimo CCCC\(\circ\)
Illa nempe die morte mala non morieris - ; - XX\(\circ\) tercio":—

which may be translated:

"Each day that thou the likeness of St. Christopher shalt see
That day no frightful form of death shall make an end of thee."

They allude to a popular superstition, common at that period, which induced people to believe that the day on which they should see a figure of St. Christopher, they would not meet with a violent death or
die without confession. To this popular superstition Erasmus alludes in his "Praise of Folly," and Chaucer no doubt alludes to it when in the "Canterbury Tales" he invests his squire with "a cristofre on his brest of silver shene."

Not only is St. Christopher the patron saint of mariners, children, and the working man, but he has since been adopted by motorists.

It may not be out of place briefly to summarise the legend of St. Christopher as it is found in the "Legenda Aurea" of Voragine:

Reprobatus was a heathen giant who was determined to serve the strongest king he could find. He goes to the mighty Pharaoh and serves him, but whenever the devil is mentioned the king crosses himself. Reprobatus perceives that he fears the devil, consequently he goes off in search of the devil to serve him. Satan takes him into his service, but one day Reprobatus sees the devil start aside at a cross. Thus he sees there is one stronger than Satan, so he leaves his service and goes in search of Christ. He finds a hermit who orders him to pray. That I cannot do says Reprobatus. Then you must carry travellers over the deep river. So Reprobatus who had been a reprobate became Christopherus and undertook his good work. One night a voice calls to him. He goes out to find a little child, and puts him on his shoulder to carry him over. But the child nearly weighed him down. When he placed the child on the other bank he said: "you seemed to weigh as heavy as the world." "Well said Christopher," answers the child, "I created the world, I redeemed the world, I bear the sins of the world," and he vanished. Thus Christopher saw that he had borne Christ over the river. It is thus that St. Christopher is represented in Western art.

On the left hand or upper board of the same manuscript which holds the St. Christopher, is another block-print, but in this instance it is undated. It represents the Annunciation (plate 6), and in the opinion of Mr. Campbell Dodgson, the Keeper of the Prints in the British Museum, belongs most certainly to the same period as the St. Christopher. The lines of the Annunciation, however, are finer, the drawing has more detail and there are no glaring faults of perspective, as in the companion print. Indeed, it may be said that the merits of the engraving are such that they seem to indicate the hand of a practised engraver rather than a beginner.

There is no reason for supposing that the dated examples are the oldest of the several hundred block-prints that have come down to us. Indeed, there is a good deal of controversy as to when the making of such prints really began, but the weight of evidence seems to favour the later decades of the fourteenth century.
The purpose of these prints is indicated by the words of invocation found on the St. Bridget and the St. Christopher prints. Therefore, quite apart from any artistic merit, these pictures are important as evidence of the moral and religious ideas of the age in which they were produced. The majority of them are representations of sacred subjects, and they show most clearly what were the objects of popular devotion, and in what manner that devotion found utterance.

The block-prints were the forerunners of the block-books, and this transition from single pictures to collections of pictures made up into books was a natural one.

The books were at first produced in the same way as the single leaf prints by being printed only on one side of the paper. They were then pasted back to back and made up into books. Others were printed in pairs, still on one side of the paper; and later still they were printed on both sides of the paper, and gathered into quires. Dr. Pollard is of opinion that the earliest specimens were intended not to be bound up but to be pasted on walls like the block-prints.

Manuscripts illustrated for the use of poor preachers had been made as early as the twelfth century, in accordance with the famous saying of St. Gregory, that the illiterate read by means of pictures, and therefore for the people in a marked degree painting takes the place of reading, in which the story is realistically unfolded by means of the pictures.

That these manuscripts served as models for the block cutters is not mere conjecture, since many examples survive which enable us to mark the transition from the painted to the printed pictures, and in several instances by placing the two side by side we seem to have surprised the cutter with the aid of a plank of wood and a sharp knife in the act of copying the painted books of a century earlier. Two or three most striking examples of this transition are preserved in the John Rylands Library, one of which is an “Apocalypse” of the middle fourteenth century, and another is the “Speculum humanae salvationis” of the same period, both of which have been very closely copied by the block cutters (plates 8 and 12).

It may be said, therefore, that the block-books were mechanical reproductions of these manuscripts, which consisted of scriptural and moral illustrations with an explanatory text. They were books to look at rather than to read. The text was subordinated to the pictures,
and may have been intended as a prompter to the priests, who, in the latter part of the fifteenth century were not as familiar with their Bibles as their office demanded.

To modern eyes the illustrations appear strange if not irreverent, but the designer had no thought of irreverence. They took the Bible stories and clothed them in a mediaeval setting, so that they might the better be understood by the illiterate.

For example, we find Gideon arrayed in plate-armour, with mediaeval helmet and visor, and a Turkish scimitar in his hand. Or, we have David and Solomon represented in rakish wide-brimmed hats with high conical crowns. The translation of Elijah takes place in a four-wheeled vehicle resembling a farmer's waggon, or an early type of motor-car. The Israelites are represented in slouched hats, puffed doublets, tight-legged breeches, and pointed shoes.

The manner of printing was practically the same as that employed in the East, since the earliest examples were printed before the printing press was devised, or adapted from the domestic press. The block was inked over with a thin watery ink by means of an improvised inking cushion. It was then covered with a sheet of dampened paper, and carefully rubbed or dabbed with a frotton, which is a small cushion composed of cloth stuffed with wool, or with some other such implement. The feasibility of this method is questioned by some authorities, but there is nothing unreasonable in the supposition that impressions were obtained in this way. The dampened paper would cling to the block as it was pressed down upon it by the frotton, and would not slip as has been suggested. As long as this method of printing continued it was impossible to print on both sides of the paper, for the friction necessary to obtain the second print would inevitably smear the first.

It was customary at one time to date block-books between 1420 and 1440, but it is now generally contended that few if any of them can be dated before 1450.

Schreiber in his "Manuel de l'amateur . . ." (1902), gives a table of thirty-three different block-books, but the number of editions of these amounted to 101, in other words, we have evidence of 101 different sets of blocks. Schreiber's view is that there is no evidence external or internal for dating any of the existing examples much before 1460.

This number and variety of the editions of the block-books are
proofs that there must have been a very large demand for them, and consequently a widespread desire for simple instruction as to the incidents in the life of Christ, and the events of Old Testament history which were regarded as prefigurements of them: as to the dignity of the Blessed Virgin; the end of the world and the coming of the Antichrist; and the spiritual dangers and temptations of the dying and the means by which they might be resisted.

As early specimens of book illustration the value of the block-books varies very greatly. The majority are more curious than beautiful, but some of them have very great merit and are full of vigour, charm, and dignity.

It has been asserted by some authorities that no block-book with legible xylographic text was produced until after the invention of typography. Be that as it may, it cannot be denied that many block-prints with legible xylographic text were produced long before the introduction of movable type, which cannot be placed earlier than 1448. That being the case we may quite reasonably assume that the block-book was a natural outgrowth of the block-print, and that it developed quite independently from the type-printed book.

The block-book, to whatever period the earliest surviving example may be assigned, was not superseded by the type-printed book. They continued to be produced, side by side, until the first quarter of the sixteenth century, and were in common use long after the so-called invention of typography.

It may be that as compared with the type-printed books the block-books are rude and clumsy makeshifts, but they long served the purpose for which they were intended, that was to appeal to the limited intelligence of the illiterate by unfolding to them, by means of pictures, the story with which they dealt, and such was the realism of the treatment that it was possible to follow the story through all its incidents without any text.

Of these interesting objects the John Rylands library is in proud possession of fifteen examples, all of which are in a remarkably fine state of preservation. The library also possesses what is probably the only surviving fifteenth-century block, from which one of the pages of one of the early editions of the “Apocalypse” was printed.

To conclude our study, we will make an attempt to describe the
most characteristic and most popular of the block-books, from the copies to which we have access.

The most popular of the block-books is known as the "Biblia Pauperum." It is without any distinguishing title, but such a title is found in a fourteenth-century manuscript copy in the Library of Wolfenbüttel, in which the opening words are: "Incipit Biblia pauperum." Ten distinct issues and editions have been distinguished by Schreiber, the earlier of which appear to have been made in the Netherlands (plate 7).

The first edition, probably printed in the Netherlands, consists of a series of forty composite pictures, arranged in three compartments, the central one representing a scene in the life of Christ, while on either side of it is an Old Testament typical incident. Explanatory letterpress is given in ribbon scrolls or in the upper corners of the pictures.

The aim of the book was the teaching of the parallel lessons of truth to be found in the Old and the New Testament. It is, in fact, a series of skeleton sermons, ornamented with woodcuts to warm the preacher's imagination and is stored with texts to assist his memory. It would be more appropriate therefore to speak of it as "Biblia pauperum predicatorum," that is: "the poor preacher's Bible."

It is said to have been designed, in its original form, by a monk named Wernher, who was living in 1180, and was famous as a painter and poet. Another authority puts the origin back to the ninth century and attributes the work to St. Ansgarius, the first bishop of Hamburg.

A number of manuscript copies, written prior to the fifteenth century are extant, of which no two are alike, although the general plan in all copies has been preserved.

As an indication of the nature of the teaching inculcated. The fourteenth page appears to inculcate the necessity of restraining appetite. In the central compartment is seen Christ resisting the temptation of the Devil in the wilderness, on one side is Adam and Eve with the forbidden fruit, and on the other side is Esau receiving the mess of pottage from Jacob.

Another very popular block-book was the "Apocalypse Sancti Johannis" or the "Book of the Revelation of Saint John the Divine," of which there are at least six distinct editions known (plates 8-9). Some have fifty leaves, others have only forty-eight printed upon one side only.
7.—A Page of the Block-book "Biblia Pauperum," from one of the copies in the John Rylands Library
8.—A page from the MS. "Apocalypsis Sancti Johannis," circa 1350,
in the John Rylands Library
9.—A Page of the Block Book "Apo Cal ypsis Sancti Johannis," from one of the copies in the John Rylands Library
10.—A PAGE OF THE BLOCK-BOOK "HISTORIA SEU PROVIDENTIA VIRGINIS MARIAE EX BANTICO CANTICORUM," FROM THE COPY IN THE JOHN RYLANDS LIBRARY
The dissimilarity in the designs and in the cutting of the pictures in these editions are so unmistakable, that each edition may be regarded as the work of a different hand.

As a literary production it may have small merit, but it served the purpose of unfolding in a realistic manner “the Revelation of St. John the Divine.” It is in fact a book of pictures, which may be rudely cut, but they indicate great strength of character in the faces, and much artistic skill in the grouping of the figures, which are a reflection of the qualities which characterise the manuscript copies of a century earlier.

Each page has two pictures representing stages in the unfolding of the vision. In the first picture St. John is represented preaching at Ephesus to a magnate whose robe or mantle is held by two attendants, and a married lady of Ephesus named Drusiana, one of the many converts of St. John. In the lower half of the same page St. John is baptising Drusiana in the Christian temple of Ephesus in a mediæval font, whilst six armed men are peeping through the chinks of the barred door, endeavouring by violence to gain entrance. The second page shows St. John brought before the prefect by soldiers and a witness, and in the lower compartment he is seen stepping into the boat which is to carry him to Patmos, whither he has been banished. The following picture shows St. John sitting in the centre of the island of Patmos, which is fashioned like a piece of floating bath cork, so as to convey the information that Patmos was an island, which is a piece of land entirely surrounded by water. The angel of the vision is by his side, and the seven churches of Asia are set out, having the appearance of seven sentry boxes before which the seven angels of the churches have mounted guard. In this manner throughout the book it is possible to follow the unfolding of the vision, stage by stage, without the assistance of any text, although texts by way of prompters are provided on each page.

Perhaps the most beautiful of the whole series is the “Historia seu providentia Virginis Mariae ex Cantico Canticorum,” which is a prefiguration of the Virgin Mary from the THE SONG OF SONGS, “Song of Songs” (plate 10).

There are two editions of this book known, in one the Latin texts or inscriptions in the scrolls are more accurate than in the other, and opinions are divided as to which is the earlier.
There are two subjects on each page, one above the other, thirty-two subjects in all.

The style of the engravings indicate a more advanced state of art than those of the "Apocalypse" and the "Biblia pauperum." The field of the cut is much better filled, and the figures contain more work and shading. In the background there are indications of a perception of natural beauty, such as the introduction of trees, flowers, and animals. Indeed, the whole treatment of the subject is that of an artist who is not an unworthy precursor of Dürer.

In some of the designs heraldic shields are introduced, the emblems on which belong to Germany rather than to Holland.

The incidents of the life of the Virgin, described in the "Song of Songs" are assumed by commentators to be typical of the history of the church.

In one of the designs agriculturists are represented in monastic habits, cutting and threshing grain, whilst others are pounding grain in a mortar, or grinding it in a hand-mill. In the background is seen a little oratory with two books open upon a desk. In this combination of agricultural work with the emblems of study may be seen an illustration of the daily work of the Brethren of the Common Life, to whom have been attributed the engraving and printing of the book. The brethren of this order were eminent as students and copyists of books, and had some distinction in the last quarter of the fifteenth century as printers, but their connection with this book cannot be definitely established.

The "Speculum humanae salvationis" has been more frequently the subject of discussion than any other of the block-books (plates 12-13). We must only allude in the briefest manner to the statements and theories that have been advanced by one and another authority in ascribing its execution to Laurens Janszoon Coster, of Harlem, who, in the act of engraving the blocks, discovered the art of printing with movable letters, and that the later edition, in which the text is printed partly from wood-blocks and partly from movable metal types, was printed by Coster's heirs and successors, the movable types having been stolen by Johann Gutenberg before the whole of the text was set up.

The volume is a small folio, of which four editions are known, two in Latin and two in Dutch. The Latin edition consists of sixty-three leaves, five of which are occupied by an introduction or prologue. In
12.—Two Pages from the MS. "Speculum humanæ salvationis," circa 1350, in the John Rylands Library
the Dutch edition the prologue occupies only four pages, giving the volume only sixty-two leaves.

There are fifty-eight cuts, each of which is divided into two compartments by a slender column in the centre. In all the editions the cuts are arranged as head-pieces, having the text beneath in two columns. The plan is almost the same as in the "Biblia pauperum," several of the subjects being treated in the same manner, although in no single instance is the design precisely the same. One compartment contains the supposed type or prefiguration, and the other is the fulfilment. For example: the Lord appearing to Moses in the burning bush is typical of the Annunciation; the brazen bath in the temple of Solomon is typical of baptism; the manna provided for the children of Israel in the desert is typical of the Lord's Supper.

Although most of the subjects are taken from the Bible and the Apocrypha, two or three are drawn from prophane history.

The "Ars memorandi," which may be described as "the art of remembering the gospels by means of symbols," is considered by some authorities to be one of the earliest of the block-books (plate 11).

It consists of fifteen woodcuts with the same number of separate pages of text, also cut in wood. In each woodcut the principal figure is a symbol which is emblematic of the evangelist whose gospel is to be impressed on the memory. The book opens with St. John, whose emblem is an eagle, and whose gospel is symbolised in three woodcuts with as many pages of text facing them; St. Matthew, represented by an angel, has five illustrations and five pages of text; St. Mark with the emblem of an ox has three cuts and three pages of text allotted to him; whilst St. Luke, represented by a lion, has four cuts and an equal number of pages of text.

The first woodcut of the collection is intended to express figuratively the first six chapters of St. John's Gospel. The eagle is the emblem of the evangelist as already indicated, and the numerals which are to be found close to the little subsidiary groups of symbols, are the references to the chapters. The contents of the first chapter is represented by the dove perched on the eagle's head, and two faces, probably intended to represent Moses and Christ and symbolising the passage "For the law came by Moses, but grace and truth came by Jesus Christ." A lute on the breast of the eagle with something like
bells suspended from it indicate the contents of the second chapter, and are supposed to refer to the marriage in Cana of Galilean. Between the feet of the eagle is a water bucket surmounted by a crown or coronet, supposed to refer to the meeting at the well of Jesus and the woman of Samaria, and to the healing of the nobleman's son at Capernaum. A fish above the eagle's right wing is a reminder of the pool of Bethesda. The principal event in the sixth chapter is the feeding of the five thousand, which is represented by two fishes and five loaves above the left wing. This group is surmounted by a cross within a circle, which is emblematic of the consecrated wafer in the Eucharist.

This was the method employed throughout the fifteen woodcuts, to assist the memory in recollecting the principal events recorded in the Gospels.

The "Ars Moriendi," literally the "art of dying" although it would be more accurately described as "the art of dying becomeingly." It is also known as "the temptations of demons."

At least ten editions of this popular book have been identified, seven in Latin, and three in German. The text is substantially the same in all editions but the pictures are dissimilar, and the engraving and printing are of unequal merit. Some copies are printed in brown ink, others in black ink. Some are printed on one side of the leaf only, others are printed on both sides. One edition is composed of twenty-four leaves of which thirteen are given up to the text and eleven to the pictures.

The object of the book is to describe the temptations that beset the dying. The first picture represents the dying man as tempted by devils concerning his faith. The succeeding picture shows the good angels who enable him to remain steadfast. In like manner the dying man is tempted by devils to despair, to impatience and to avarice, but through the help of the angels he triumphs over all his adversaries. In the last of the series of pictures the spirit of the dying man is being exhaled from his mouth, and is received by the angels, to the utter disgust of the baffled devils who display frightful contortions as they beat a retreat.

The ostensible purpose of the book was the preparation of men for another world, but the real object was the aggrandisement of the
church, and to this end the writer of the book recommended the sacrifice of the desire to provide for one's family.

Another book which belongs to the later period is the "Kunst Chiromantia" of Dr. Johann Hartlieb, a folio consisting of forty-four figures of the human hand, which was probably composed in 1448, and for some time circulated in manuscript before being printed.

The text is in German, and the copy in the John Rylands Library bears the name of the printer and place of printing as Jorg Schapff of Augsburg, who is supposed to have been the engraver and printer of the book in 1475. The work does not do him much credit.

The author foretells the destiny of man by his right hand, and of woman by her left hand. At the time of its issue in 1475, chiromancy was regarded as a science.

Of the two latest block-books in the Rylands collection one is a little guide-book for visitors to Rome, known as the "Mirabilia Urbis Romae," which is composed of ninety-two leaves printed on both sides of the paper, with a few illustrations.

It was probably first published to meet the rush of German pilgrims to Rome on the occasion of the Jubilee of Pope Sixtus IV., in 1475. It is suggested that the blocks were cut in Germany, but that the printing was executed in Italy, since some of the ornaments are found to have been used in type-printed editions issued by Stephen Planck.

The other which is generally quoted as the latest of the block-books is: "Opera nova contemplativa per ogni fidel christiano la quale tratta de le figure del testamento vecchio, le quale figure sonno verificate nel testamento nuova." It is an adaptation of the "Biblia pauperum," thus the last as it may have been the first of the block-books. It is undated, but the name of the publisher is given as Giovanni Andrea Vavassore, who worked at Venice about 1530.

The transition from the block-book to the type-printed illustrated book is shown in an interesting form in the "Biblia pauperum," printed by Albrecht Pfister, at Bamberg, in or about 1461, in the type known as the 36-line type, because it was employed in the Bible technically described as the 36-line Bible, which has thirty-six lines to each column, to distinguish from the other Bible which has forty-two lines to each column (plate 14).
It is interesting as being the first type-printed book to be printed with illustrations, unless the "Speculum humanae salvationis" antedates it, and therefore would appear to have been copied from or suggested by its block-book prototype.

There are two editions known, one in Latin, the other in German, of each of which the only copies in this country are to be found in the John Rylands Library.

AUTHORITIES.

We have not thought it necessary to indicate the references to authorities in footnotes on every page, but to give in this way, in the form of an appendix to the article, a list of the principal sources of information upon which we have drawn.

We wish to emphasise our indebtedness to the work of the late Professor T. F. Carter, of Columbia University, on "The invention of printing in China and its spread westward" which has been invaluable, for it has brought a flood of new light upon the subject with which it deals.

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