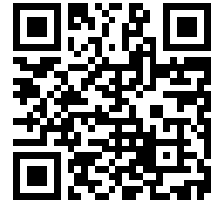

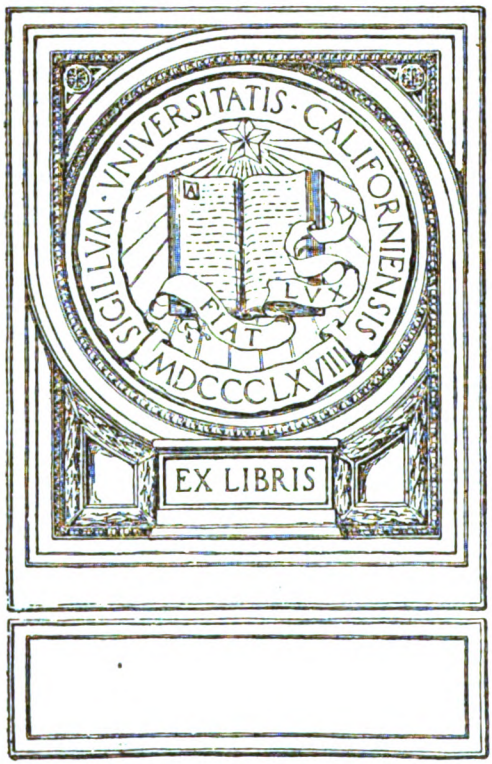

THE INVENTION OF PRINTING IN CHINA AND ITS SPREAD WESTWARD

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TO

PAUL PELLIOT

Membre de l'Institut, Professor of the Languages, History and Archaeology of Central Asia in the Collège de France, the master mind of Chinese historical research; whose example, whose writings, and whose revision of the manuscript have made possible such measure of accuracy as this work can claim

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INTRODUCTION

FOUR great inventions, that spread through Europe at the beginning of the Renaissance, had a large share in creating the modern world. Paper and printing paved the way for the religious reformation and made possible popular education. Gunpowder levelled the feudal system and created citizen armies. The compass discovered America and made the world instead of Europe the theater of history. In all these inventions and others as well, China claims to have had a conspicuous part. The purpose of the present work is to investigate the truth of this claim in the one domain of printing.

The restlessness of the tribes of Central Asia during the early centuries of our era brought several hundred years of anarchy in China, corresponding to the Dark Ages in Europe; but as these barbarian migrations did not cause quite such a complete rooting up of classical civilization in the Far East as they did in the West, China quickly recovered and was earlier ready for those inventions which came into Christendom with the beginning of the Renaissance. Marco Polo's record shows us a China whose new civilization already in the thirteenth century had come to full bloom and had advanced very much farther than that of contemporary Europe.

When Europe was ready for the new life, she found in the Arabic Empire and Constantinople reservoirs ready at hand where the lore of her own classical world had been stored away, and to these reservoirs she turned with a real thirst. But with the classic lore there was a certain new element that also entered Europe from the East—an essentially modern spirit of invention and practical discovery. The mediators of the inventions that reached Europe at this time were the Arabs and the Empire of the Mongols. But the inventors were neither Arab nor Mongol. There seems to be good reason to believe that certain processes

that had been gradually evolved in China, when joined with the recovered civilization of Greece and Rome, had much to do with starting Europe forward on her course of progress, a course to which the classics alone could never have led. It is the glory of European genius, newly awakened from its thousand years of sleep, that it was able to seize these discoveries, dimly seen in the Far East, and in some cases but dimly understood in the land of their birth, and to make of them the basis for a civilization of which their discoverers could never have dreamed.

Preëminent among these inventions of China, on account of their influence both in Eastern Asia and in Europe, stand paper and printing. The invention of paper has already received considerable attention. The scientific study of the subject in the West was begun by Dr. Friedrich Hirth, who held for many years the chair of Chinese at Columbia University, and its popular presentation has been carried forward by Mr. H. G. Wells in his Outline of History. The facts concerning China's part in the invention of printing, on the other hand, have been almost unknown to European scholarship, except in a few of their larger outlines. The Encyclopedia Britannica (Eleventh Edition), which in its article on typography devotes seventeen pages to the controversy as to whether Gutenberg or Coster invented movable type in Europe, tells all it knows of pre-European printing in less than half a column. And the catalog of the State Library in Berlin, in its two great folio volumes of titles on the history of printing, has just one title that refers to China—a magazine article that appeared in Paris in 1847.

No historical research however can lay claim to complete originality, and this study of Chinese printing may be considered a compendium of the researches of a multitude of scholars, scholars of many centuries, Chinese, Japanese and Western, correlated with certain of the results of recent excavations in Turkestan and in Egypt. The biblography indicates the main sources, and indicates also the debt of gratitude felt by the author to all these investigators, the results of whose labors have been freely borrowed.

On the other hand, the gathering together and correlating of this source material from different ages and different parts of the world has been largely a virgin field. It is this which has made the work at the same time difficult and inspiring.

Apparently, the first mention in European literature of the Chinese invention of printing dates from the year 1550, when the Italian historian Jovius, from an examination of certain printed books brought from Canton by Portuguese travellers and presented by the King of Portugal to the Pope, came to the conclusion that European printing was derived from China.[1] In the eighteenth century Phil. Couplet in the British Encyclopedia, writing evidently on the authority of Roman Catholic missionaries, assigned the year 930 as the date of the Chinese invention. Gerard Meerman in his *Origines Typographicae* in 1765 told of early Chinese printing, basing his statement on Arabic authority.[2]

A further study of the subject from Chinese sources was made by Jules Klaproth[3] in 1834 and by Stanislas[3] Julien in 1847. The results of Julien's work were published in a short article in the Journal Asiatique, which, in spite of inaccuracies, has formed the basis of practically all that has been written on the subject in the West up to the present. A letter from Thomas T. Meadows to Lord Elgin, published as part of a paper by Lord Robert Curzon in the Miscellanies of the Philobiblon Society of London in 1858,[3] contains what is probably the best account of the Chinese invention of block printing that has appeared in any European language even down to our own day, but unfortunately this letter has been hidden away in a little known publication and in an article the balance of which is of doubtful value, and it has apparently escaped the attention of later writers.[4] Since 1858 little if any independent work devoted to printing in China has appeared in any European language until 1923, when Dr. Hermann Hülle[3] of Berlin published in a fifteen-page booklet a clear summary of the history of Chinese typography and its development in Korea, based partly on Julien and Satow, partly on independent research in Chinese sources. The writer had the privilege of working for

some months under the expert direction of Dr. Hülle, who is in charge of the Chinese department in the State Library at Berlin, and who very kindly placed all his source material at the writer's disposal.

Meanwhile an article on the history of early printing in Korea and Japan was published in 1882 in the Journal of the Asiatic Society of Japan by Sir Ernest Satow [2] and has remained to the present the main source of what is known in the West on that subject.

Modern scholarship in Japan and China has produced at least three works [5] which gather up the main historical facts concerning the history of printing in their respective countries, the Japanese work, as is natural, dealing somewhat with Chinese sources and more fully with those of Korea, as well as with the Japanese development of the invention. Unfortunately these books are available only in Japanese and Chinese respectively and have not been mentioned, so far as the writer is aware, in any European work. All are brief but are far more complete than the short sketches mentioned above that have appeared in European languages.

These articles and books in five of the world's leading languages have been used freely in the preparation of the present work, both for the actual information contained and more especially for their references to earlier Chinese literature.

Another important source has been the great Chinese encyclopedias, especially the *T'u-shu-chi-ch'eng*,[3] published in 1726, and the *Ko-chih-ching-yüan*,[3] published in 1735. These too have been valuable largely on account of their quotations from earlier works.[6] Unfortunately, while new improvements in the art of writing, such for instance as the invention of the hair pen and the invention of paper, have called forth a voluminous literature of antiquarian research by Chinese writers, printing has as a rule been taken for granted and sparsely mentioned. Calligraphy has been considered the work of artists, printing that of artisans. However, by supplementing such direct references as have been found with many indirect references, it is possible to gain a fairly clear pic-

ture of the early history of the art, at least as clear a picture as we have of early European block printing, which grew up equally in the dark. Needless to say, further research will probably find very much material in the great mine of Chinese literature that has not yet been unearthed.

A further source, and that which gives us our most certain information, is archaeology. The desert air of Chinese Turkestan, like that of Egypt, has preserved intact the memorials of ancient civilization, and the researches of British, French, German, Russian and Japanese expeditions have made it possible to reconstruct the history and daily life of these western outposts of China during the first thousand years or more of our era. One result of this research has been clear testimony to the accuracy of the Chinese records of the period. Another result bearing more directly on the subject in hand has been the discovery in different parts of Turkestan and its border lands of a large number of block prints and block books of varying date, which shed light both on the progress of the art of printing in China and on its westward course. Excavations in Egypt also have revealed the products of a hitherto unsuspected block printing activity continuing through the time of the Crusades, the significance of which must still be regarded as something of a mystery, but which may eventually lead the way toward the discovery of the connection between the block printing of the Far East and that of Europe. An examination of these archaeological discoveries, in books, in the museums where they are preserved and more especially in personal conversation with the archaeologists themselves, has been the most interesting part of the study on which the present work is based.

Further source material on particular phases of the problem will be found in the bibliography, which, on account of the variety of material, has been arranged by chapters.

As indicated above, it is not only to books that the writer is indebted. A far more personal debt must here be acknowledged. The keenest pleasure in the preparation of the work has been the counsel, guidance and criticism—and the friendship—of some of

the world's leading scholars in the realms of Chinese, Central Asiatic and Arabic history. In this work nationality has been forgotten. In Berlin and Vienna, as well as in Nanking, Paris and London, unfailing kindness and coöperation have been met.

The expert guidance of Dr. Albert von Le Coq, given freely day after day in the study of the Turfan discoveries at Berlin, the inspiration given by Dr. Adolf Grohmann of Prague in the study of the block prints of Egypt at Vienna, the help afforded by Mr. Arthur Waley and Mr. Lionel Giles in the examination of the Tunhuang finds at the British Museum, the well-nigh perfect library assistance afforded by Dr. Hermann Hülle of Berlin, and the patience of my colleagues at Columbia University, Professor Lucius C. Porter of the Chinese Department, Professor A. V. Williams Jackson of the Indo-Iranian Department, Professor Richard J. H. Gottheil of the Semitic Department and Professor William L. Westermann of the Department of Ancient History, in reading the manuscript and making valuable suggestions, all place the writer under a debt of gratitude such as can never be repaid.

But deepest of all is my obligation to Professor Paul Pelliot of the *Collège de France*. Not only has Professor Pelliot set a new standard of accuracy and acumen in Chinese research to which all investigators are indebted. Not only have his researches in literature and in archaeology furnished a mass of facts on which many of the conclusions of this book are based. The debt of the writer to Professor Pelliot goes further. For Professor Pelliot has patiently gone over the first draft of the manuscript chapter by chapter, has gradually introduced the writer to more clear-cut and accurate methods of Chinese research, has made on almost every page suggestions and corrections which the writer has sought to follow up and incorporate, and has given freely of his store of historical understanding.

In such a work as this, it is impossible to acknowledge one's debt to all who have freely rendered assistance, but to the following, who, in addition to those already mentioned, have given largely of their time and their expert knowledge, a word of gratitude must

be expressed: Dr. Vasseely Alexeiev, professor of Chinese Philology, University of Leningrad (Petrograd); Mr. Laurence Binyon, curator of Oriental Art, British Museum; Professor Edward G. Browne, Department of Arabic, Pembroke College, University of Cambridge; M. Henri Cordier, *Membre de l'Institut*, professor of Chinese History in the *Ecole des Langues Vivantes*, Paris; Père Henri Doré, author of *Superstitions en Chine;* Dr. Erich Hänisch, professor of Chinese, University of Berlin; Dr. Sven Hedin, head of the Swedish expeditions of exploration in Central Asia; Mr. John Hefter, librarian of Chinese books, Columbia University Library, New York; Dr. Friedrich Hirth, former Dean Lung professor of Chinese, Columbia University; Mr. T. S. Hsü, of the faculty of Chinese History, Peking University; Mr. Homer B. Hulbert, author of *The History of Korea;* Mr. Y. F. Hung, head librarian, National Southeastern University, Nanking; Rev. William C. Kerr, American Presbyterian Mission, Seoul, Korea; Dr. Sten Konow, professor of Sanskrit, University of Kristiania; Dr. Berthold Laufer, curator of anthropology, Field Museum of Natural History, Chicago; Mr. S. Y. Li, acting librarian of the Chinese collection, Library of Congress, Washington; Dr. David S. Margoliouth, professor of Arabic, Oxford University; Dr. Bernhard Moritz, professor of Arabic, *Seminar für Orientalische Sprachen*, Berlin; Dr. F. W. K. Müller, director of the Chinese and Indian departments, *Museum fur Völkerkunde*, Berlin; Professor Rudolf M. Riefstahl, Department of Fine Arts, New York University; Dr. Clementz Scharschmidt, professor of Japanese, *Seminar für Orientalische Sprachen*, Berlin; Dr. Theodor Seif, curator of Arabic papyri and papers in the Erzherzog Rainer Collection, Austrian National Library, Vienna; Dr. Adolf Stix, curator of European incunabula, Austrian National Library, Vienna; Dr. Walter T. Swingle, chairman of Library Committee, United States Department of Agriculture, Washington; Dr. Clark Wissler, curator of anthropology, American Museum of Natural History, New York.

Grateful acknowledgement should also be made of the sources

from which illustrations have been received. These are in the main from original photographs taken in the museums where the objects are preserved. The writer is specially indebted to Mr. Waley and to Dr. von Le Coq for their courtesy and assistance in obtaining photographs from the British Museum and the *Museum für Völkerkunde*. Where illustrations are reproduced from other books, acknowledgment is made in abbreviated form beneath the illustration concerned, and the full title, with date and place of publication, will be found at the close of the bibliography.

The romanization of Chinese words is that of Giles, which, in spite of serious drawbacks, seems to be the one most generally used among scholars. Exceptions are made of the names of provinces and large cities like Peking, where the post office romanization has been followed. The names of those dynasties that are easily confused in Giles' romanization are here spelled in the more easily recognized form, Ts'in, Tsin and Kin.

The hope with which this book goes forth cannot be better expressed than in the words of the Chinese writer Tai T'ung, who wrote and had printed during the thirteenth century a book on the history of Chinese writing:

> Were I to await perfection, my book would never be finished, so I have made shift to collect the fruits of my labors as I find them. It was said by the Master, "In preparing the governmental notifications, P'i Shen first made the rough draft; Shih Shu examined and discussed its contents; Tzŭ-yü, the manager of foreign intercourse, then made additions and subtractions; and finally Tzŭ-ch'an of Tung-li gave them the proper elegance and finish." Such a rough draft is the present work. For the examination and discussion of whatever truth it contains, it awaits the judgment of a master-mind, . . . one whose wise and lofty spirit will lead him, without looking down upon the author, to . . . correct and suppress where the text is in error, to add where it is defective, and to supply new facts where it is altogether silent. [7]

PART I

THE BACKGROUND OF PRINTING IN CHINA

CHAPTER I

THE INVENTION OF PAPER

BACK of the invention of printing lies the use of paper, which is the most certain and the most complete of China's inventions. While other nations may dispute with China the honor of those discoveries where China found only the germ, to be developed and made useful to mankind in the West, the manufacture of paper was sent forth from the Chinese dominions a fully developed art. Paper of rags, paper of hemp, paper of various plant fibers, paper of cellulose, paper sized and loaded to improve its quality for writing, paper of various colors, writing paper, wrapping paper, even paper napkins and toilet paper[1]—all were in general use in China during the early centuries of our era. The paper, the secret of whose manufacture was taught by Chinese prisoners to their Arab captors at Samarkand in the eighth century, and which in turn was passed on by Moorish subjects to their Spanish conquerors in the twelfth and thirteenth centuries, is in all essential particulars the paper that we use to-day. And even in our own times China has continued to furnish new developments in paper manufacture, both the so-called "India paper" and "*papier maché*" having been introduced from China into the West during the nineteenth century.[2]

Though the invention of paper is carefully dated in the dynastic records as belonging to the year A.D. 105, the date is evidently chosen rather arbitrarily, and this invention, like most inventions of our own day, was a gradual process. Up to the end of the Chou Dynasty (255 B.C.), through China's classical period, writing was done with a bamboo pen, with ink of lacquer made from tree sap,[3] upon slips of bamboo or wood. Wood was used largely for short messages, bamboo for longer writings and for books. The bamboo was cut into strips about nine inches long and wide enough for a

single column of characters. The wood was sometimes in the same form, sometimes wider. The bamboo strips, being stronger, were capable of being perforated at one end and strung together, either with silken cords or with leather thongs, to form books. Both the wooden strips and those of bamboo are carefully described in books on antiquities, written in the early centuries of the Christian era. The abundance of wooden and bamboo slips dug up in recent excavations in Turkestan conform exactly to the early descriptions.

The invention of the writing brush of hair, attributed to the general Mêng T'ien in the third century B.C., worked a transformation in writing materials. This transformation is indicated by two changes in the language. The word for chapter used after this time means "roll"; the word for writing materials becomes "bamboo and silk" instead of "bamboo and wood." There is evidence that the silk used for writing during the early part of the Han Dynasty consisted of actual silk fabric.[4] Letters on silk dating probably from Han times, have been found together with the earliest extant paper in a watch tower of a spur of the Great Wall.

But as the dynastic records of the time state, "silk was too expensive and bamboo too heavy." The philosopher Mê Ti, when he travelled from state to state, carried with him three cart loads of bamboo books. The emperor Ts'in Shih Huang set himself the task of going over daily a hundred and twenty pounds of state documents. Clearly a new writing material was needed.

The first step was probably a sort of paper or near-paper made of raw silk. This is indicated by the character for paper, which has the silk radical showing material, and by the definition of that character in the *Shuo-wên*, a dictionary that was finished about the year A.D. 100. A bit of this early near-paper may also be among the finds of Dr. Stein, but it is not yet certain.

The year A.D. 105 is usually set as the date of the invention of paper, for in that year the invention was officially reported to the emperor by the eunuch Ts'ai Lun. Whether Ts'ai Lun was the real inventor or only the person in official position who became the patron of the invention (as Fêng Tao did later with printing) is

uncertain. In any case his name is indelibly connected with the invention in the mind of the Chinese people. He has even been deified as the god of paper makers, and in the T'ang Dynasty the mortar which Ts'ai Lun was supposed to have used for macerating his old rags and fish nets was brought with great ceremony from Hunan to the capital and placed in the imperial museum. The following is the account of the invention, as written by Fan Yeh in the fifth century in the official history of the Han Dynasty, among the biographies of famous eunuchs:

"During the period *Chien-ch'u* (A.D. 76–83), Ts'ai Lun formed part of the Imperial Guard. The emperor Ho Ti, on coming to the throne, knowing that Ts'ai Lun was a man full of talent and zeal, appointed him a privy counsellor. In this position he did not hesitate to bestow either praise or blame upon His Majesty.

"In the ninth year of the period *Yung-yüan* (A.D. 97) Ts'ai Lun became inspector of public works. By his plans and according to his arrangements, engineers and workmen made, always with the best of materials, swords and arms of various sorts. Later generations could do no better than imitate his methods of work.

"In ancient times writing was generally on bamboo or on pieces of silk, which were then called *chih*.[5] But silk being expensive and bamboo heavy, these two materials were not convenient. Then Ts'ai Lun thought of using tree bark, hemp, rags and fish nets. In the first year of the *Yüan-hsing* period (A.D. 105) he made a report to the emperor on the process of paper making, and received high praise for his ability. From this time paper has been in use everywhere and is called the 'paper of Marquis Ts'ai'."[6]

The biographical note goes on to tell how Ts'ai Lun became involved in intrigues between the empress and the grandmother of the emperor, as a consequence of which, in order to avoid appearing before judges to answer for statements that he had made, "he went home, took a bath, combed his hair, put on his best robes, and drank poison."[7]

Two statements in this quotation have received ample confirmation from discoveries along the Great Wall and in Turkestan. The rapid spread of the use of paper, attested by many notices in Chinese literature, is rather surprisingly shown by the discovery along with letters on silk and wood, of nine letters on paper in a watch tower of a western spur of the Great Wall, which must have been written some time within the first fifty years after Ts'ai Lun's invention.[8]

The statement concerning the materials used has also been thoroughly confirmed. Examination of paper from Turkestan, dating from the second to the eighth centuries of our era, shows that the materials used are the bark of the mulberry tree; hemp, both raw fibers and those which have been fabricated (fish nets, etc.); and various plant fibers, especially China grass (*Boehmeria Nivea*), not in their raw form but taken from rags.

The discovery of rag paper in Turkestan, while confirming the statement in the Chinese records, came as a surprise to many western scholars. From the time of Marco Polo till some forty years ago, all oriental paper had been known as "cotton paper," and it had been supposed that rag paper was a German or Italian invention of the fifteenth century. Wiesner and Karabacek in 1885–1887 showed as a result of microscopic analysis that the large quantity of Egyptian paper that had at that time recently been brought to Vienna, and that dated from about A.D. 800 to 1388, was almost all rag paper. A subsequent examination of the earliest European papers showed that they too were made in the main from rags. The theory was then advanced and generally believed that the Arabs of Samarkand were the inventors of rag paper, having been driven to it by inability to find in Central Asia the materials that had been used by the Chinese. In 1904 this theory suffered a rude shock. Dr. Stein had submitted to Dr. Wiesner of Vienna some of the paper found by him during his first expedition to Turkestan, and Dr. Wiesner, while finding in that no pure rag paper, did find paper in which rags were used as a surrogate, the main material being the bark of the paper mulberry. The theory

STATIONERY OF
BAMBOO AND
WOOD OF THE
HAN DYNASTY

Bamboo 20 x 1.3 cm.
Wood 11 x 2 cm.

Schreib und Buchwesen.

THE EARLIEST PAPER THAT HAS SO FAR BEEN DISCOVERED

Date about A.D. 150. Found in 1907 by Sir Aurel Stein in the ruins of a spur of the Great Chinese Wall, together with some fragments in Chinese of about the same date, and eight other letters which like this are in the Sogdian language. When found, the letters were sealed in envelopes of paper and rag
(19 x 24.5 cm.)

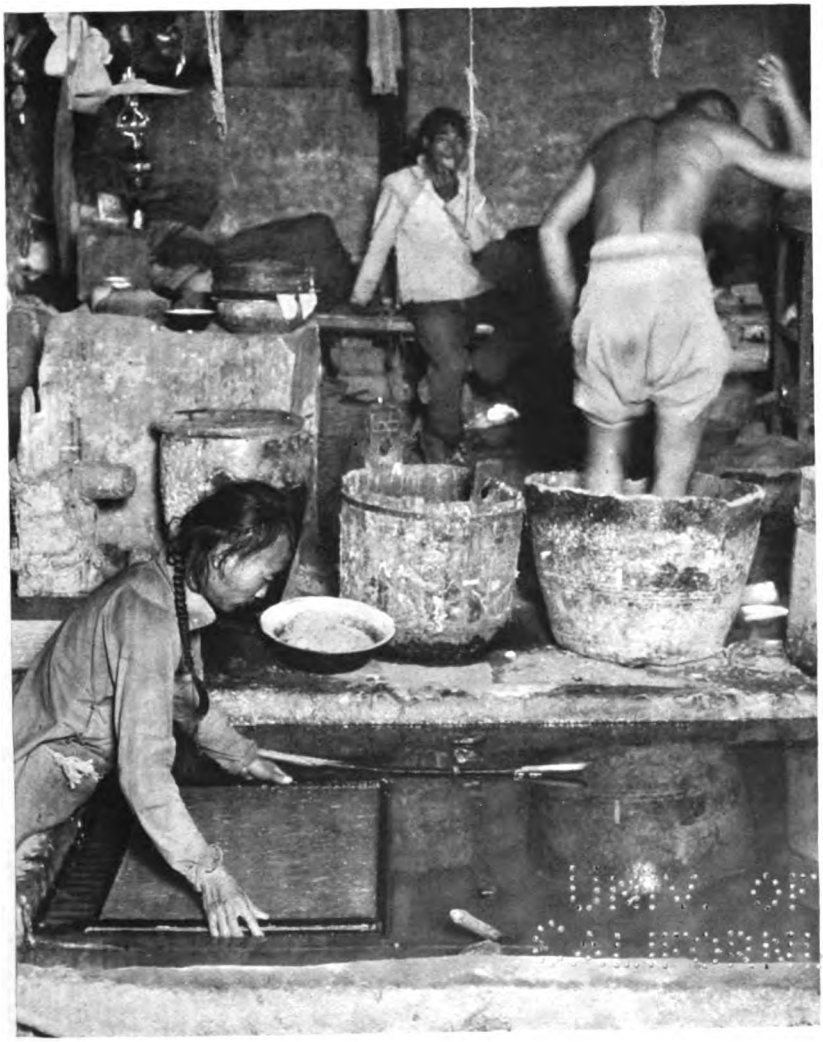
British Museum.

was changed to suit the facts. The Arabs of Samarkand were no longer the first to have used rags in the production of paper, but the first to have produced paper *solely* of rags. Finally in 1911, after Dr. Stein's second expedition, the earliest paper—that from the watch tower in the Great Wall—was laid before Dr. Wiesner, and was found to be a pure rag paper! Rag paper, supposed till 1885 to have been invented in Europe in the fifteenth century, supposed till 1911 to have been invented by the Arabs of Samarkand in the eighth century, was carried back to the Chinese of the second century, and the Chinese record, stating that rag paper was invented in China at the beginning of the second century, was confirmed.

The use of paper, so far superior to bamboo and silk as a writing material, made rapid headway. Extensive improvements in its manufacture were made by Tso Tzŭ-yi, a younger contemporary of Ts'ai Lun. The records of the next centuries contain abundant references to the use of paper and to certain special fancy and beautiful papers that from time to time appeared. In Turkestan, at each point where excavations have been undertaken, the time when wooden stationery gave way to paper can be fairly accurately dated. By the time of the invention of block printing all Chinese Turkestan, so far as excavations show, was using paper.[9] The use of paper in China proper had apparently become general much earlier.

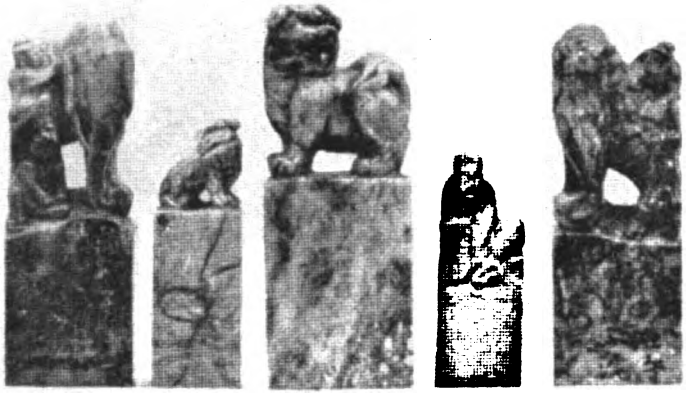
The papers found in Turkestan show a certain amount of progress, especially in the art of loading and sizing to make writing more easy. The earliest papers are simply a net of rag fibers with no sizing. The first attempt to improve the paper so that it would absorb ink more readily consisted of giving the paper a coat of gypsum. Then followed the use of a glue or gelatine made from lichen. Next came the impregnation of the paper with raw dry starch flour. Finally this starch flour was mixed with a thin starch paste, or else the paste was used alone. Better methods of maceration also came into use that proved less destructive of the fibers and produced a stronger paper. All these improvements

were perfected before the invention was passed on to the Arabs in the eighth century and before the first block printing in China began. So far as an invention can ever be said to be completed, it was a completed invention that was handed over to the Arabs at Samarkand. The paper making taught by the Arabs to the Spaniards and Italians in the thirteenth century was almost exactly as they had learned it in the eighth. The paper used by the first printers of Europe differed very slightly from that used by the first Chinese block printers five centuries or more before.



CHINESE PAPER MAKERS IN PEKING

Asia Magazine.



CHINESE SEALS AND SEAL IMPRESSIONS

These impressions are made with ink on paper like the impressions of a rubber stamp

CHAPTER II

THE USE OF SEALS

THE fact that the same Chinese word to-day denotes both print and seal is suggestive. A study of the history of the word sheds considerable light on the origin of Chinese printing. During the Han Dynasty the word *yin*[1] meant to authenticate by the impression of a seal on clay. When clay impressions gave way some time about the fifth or sixth century of our era to inked impressions in red, the same word was used. When Taoist priests used as charms the impressions of wooden seals several inches square inscribed with the name of Lao-tzŭ or some other worthy, these larger seals were *yin*. When later the manifolding of Buddhist pictures and texts began, this block printing was *yin*. With the advent of every new invention, from that of moveable type in the eleventh century to that of the linotype in the twentieth, the same word has done duty, and the word *yin* to-day, which still means seal, signifies also every form of printing, taken in the broadest sense.

As the relation between Chinese printing and Chinese seals has not previously been traced, so far as the author is aware, it may be well to examine this genealogy in more detail.

Back of the seal and the seal impression—away back in the Chou Dynasty (before 255 B.C.)—lies a practice that reminds one of the tearing of the laundry check in the Chinese laundries of America.[2] When a contract was made, it was written in duplicate on the two ends of a stick of bamboo. The bamboo was broken and one end retained by each party. The fitting of the broken ends was the authentication of the contract. In like manner, when the emperor bestowed a patent of nobility, the token of that patent was one half of a broken piece of jade—the other half being kept in the imperial possession.[3]

With the advent of the great emperor Ts'in Shih Huang (246–209 B.C.), the unifier of China and the builder of the Great Wall, and with the more complex organization that then began, the broken pieces of bamboo and jade gradually gave place to seals and seal impressions.[4] The great seal of the conqueror, brought from the southern state of Ch'u by the minister Li Ssŭ, and engraved with eight characters, was for centuries the seal of empire, and its fortunes figure both in history and in romance.

The transition from the broken jade to the seal—from the primitive matching of broken edges to the more advanced and complicated matching of impression and die—was a natural one. But it may have been hastened by events that were taking place in another part of Asia. Just a hundred years before Ts'in Shih Huang's conquests, Alexander the Great had conquered a part of India and had brought Greek culture to certain countries of Central Asia which were not so far removed from the expanding borders of China. In the land that lies between Alexander's empire and that of China—the country now called Chinese Turkestan—there was found a few years ago by Sir Aurel Stein a collection of deeds, the seals upon which show the strange mingling of influences, Eastern and Western, that was going on during the Han Dynasty, the dynasty that followed Ts'in Shih Huang. The documents, written on wood, are all closed, bound with cords, and sealed, the devices of the seal impressions being in some cases Chinese characters, in others elephants and Indian emblems, in still others heads of Zeus, Eros and Medusa.[5] It is of course far from certain that this Hellenistic influence had penetrated beyond Turkestan and into China—still less certain that it had penetrated as early as the reign of Ts'in Shih Huang. On the other hand it is not an impossibility.[6]

With the Han Dynasty (B.C. 206–A. D. 220) the use of seals grew steadily more common, both for private and for imperial use. Seal cutting came to be a fine art, and for perfection of workmanship the seals of this time have never been surpassed.[7] They were

made of jade, of gold, of silver, of copper, of ivory and of rhinoceros horn.[8]

The seal impressions of the Han Dynasty that have been found are in one respect quite different from those of later times. The impressions were made, like those of Europe,[9] in a soft substance (in China a sort of clay was used) and without coloring matter, like the seal impressions in wax to which we are accustomed in the West.[10] From the T'ang Dynasty on, on the other hand, such seal impressions as have been found have been made not in clay, but with ink (usually red ink of cinnobar) on paper, like the impressions of a rubber stamp. It is this stamped seal impression that developed naturally into the block print. For the stamping of a seal with ink on paper is not very far removed from block printing. The seal was small and its purpose was authentication. The block print was larger and its purpose was reduplication. The idea of authentication—a survival from association with the seal—was never quite lost in Chinese printing. When Rashid-eddin of Persia in the fourteenth century—in the days of large scale book publication—described Chinese printing, he described it as a method of authentication of documents.

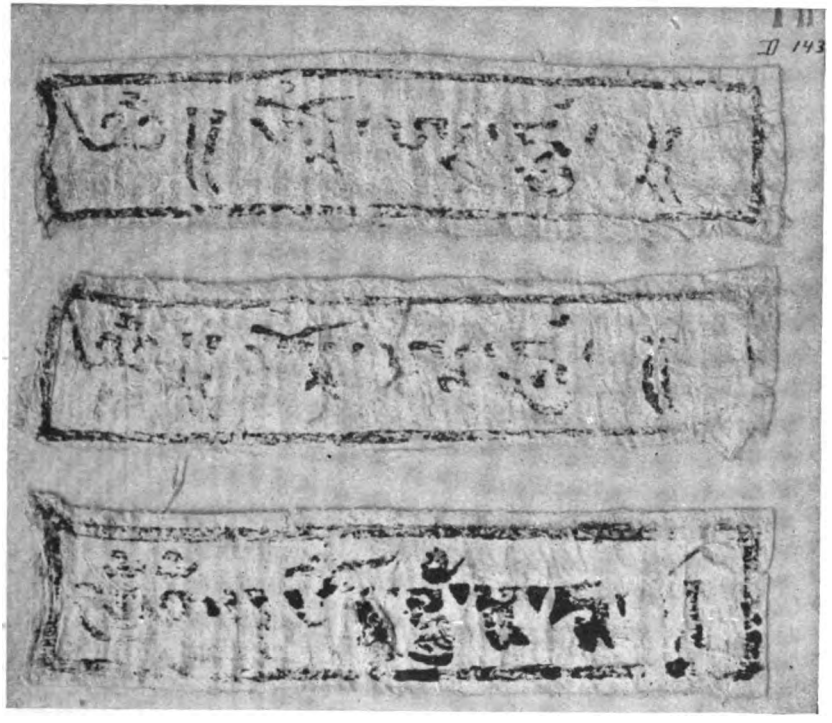
When the transition took place from the clay seal impression of the Han Dynasty to the paper and ink impression of later times, it is impossible to determine with accuracy. Very few seal impressions of the transition time have been found in Turkestan. From Chinese records, combined with such evidence as can be gathered from Turkestan finds, it would seem that the transition took place about the fifth and sixth centuries of our era.[11] At one point in Turkestan where documents of the transition period were found, those written on wood were sealed with clay, while those written on paper were sealed with ink.[12] The transition was without doubt gradual, and followed naturally the increasing use of paper.

As for the transition from the stamped seal to the true block print, there seem to have been two lines of development. The Buddhist line—the line which finally bore fruit and yielded not only charms but woodcuts and books in abundance—will be

traced in a later chapter. The Taoist line of approach is much more vague and uncertain, yet it seems rather likely that the Taoists in their desire for charms developed the seal impression into something very closely resembling a block print even earlier than the Buddhists.

A Taoist writer, Ko Hung, in the fourth century made the curious statement, "The ancients, whenever they entered the mountains, wore a *yüeh-chang* seal of the Yellow God, four inches in breadth and bearing a hundred and twenty characters, with which they made impressions in clay, in consequence of which, whenever they halted, neither tigers nor wolves ventured to approach. If while travelling they saw a fresh foot-print and impressed the seal there in the same direction in which the beast moved, they made the tiger proceed, and, if they did so in the reverse direction, they made it return. . . . A Taoist doctor in Wu named Tai Ping made some hundreds of *yüeh-chang* impressions in clay, and strewed that clay broadcast into the abyss; on which after a while a large tortoise rose to the surface more than ten feet in diameter. When it was slain the sick all recovered."[13]

These large charm seals, large enough to contain a hundred and twenty characters, were used not to print with ink, but to make impressions on clay—but they were made in the fourth century when all seal impressions were on clay. Some time in the next two hundred years or so, the fashion in non-Taoist seal impressions changed from clay to red ink. The question is, whether the Taoists with their large seals kept abreast of the times. There is evidence that these large seals were made of wood,[14] and there is abundant evidence that the Taoists loved red ink—that they loved it especially for their charms, on account of the extra authority that the red seemed to give.[15] Exact evidence that their stamped seals, as well as their written charms, were made with red ink is yet to be found. The earliest block printing of which we now have clear proof consists of Buddhist charms and dates from the eighth century.[16] When the evidence is all in, it is likely to show that before this date the Taoists had dipped their wooden



PRIMITIVE CHARM PRINTS IN THE TIBETAN LANGUAGE

(Charms 10.4 x 2.06 cm. each)

Museum für Völkerkunde.

CLAY CONTAINERS IN WHICH TIBETAN CHARM PRINTS WERE FOUND

To find the charm, the clay container must be broken open. Though these charms may not be earlier than the twelfth century, they represent a survival of the most primitive form of block printing. From Sangim Agiz near Turfan

Museum für Völkerkunde.

seals in red ink of cinnobar and had made charms of such form that they will take rank as the world's first block printing.

It is not impossible that these Taoist seal-charms were the ancestors also of playing cards, but before that can be stated with confidence much fuller research must be done.[17]

In any case, whether Buddhist or Taoist, the charm was the transition from the seal to the block print. For with the advent of the stamped charm, reduplication, and large scale reduplication, came to be the dominant purpose.[18]

CHAPTER III

RUBBINGS FROM STONE INSCRIPTIONS

WHILE the connection of seals with the beginnings of block printing has never been especially noted by Chinese writers, there is a practice of taking inked rubbings or squeezes from stone inscriptions, which has always been recognized as having directly led the way to the making of books by inked impressions from wood.

The process is very simple. A piece of felt is laid on the surface of the stone inscription, and over this is applied a thin tough sheet of cohesive paper that has previously been moistened. The paper with the felt behind it is then hammered with a mallet and rubbed with a brush till it fits into every depression and crevice of the stone. As soon as the paper is dry, a stuffed pad of silk or cotton is dipped in sized ink and passed lightly and evenly over it. When the paper is finally peeled off, it is found to be imprinted with a perfect and durable impression of the inscription, which comes out in white reserve on a black ground. The process is similar to block printing, but the characters of the inscription are cut into the stone instead of standing out in relief as they do in wood. Furthermore, as the ink is applied to the surface of the paper that is away from the stone, the text on the stone is not reversed. The direction of the text on the paper is the same as that on the stone from which it is taken.

As the seal charm was the Taoist preparation for printing, developing in Buddhist hands into the printing of religious texts and pictures, so these rubbings from stone may be said to have constituted in the main the Confucian preparation.

The practice of cutting in stone the text of the Confucian Classics in order to insure permanency and accuracy goes back as far as the year A.D. 175. The statement in the annals of the Han Dynasty is as follows:

A STONE INSCRIPTION AND A PAPER RUBBING MADE FROM IT

Schreib und Buchwesen.

"Because the time of writing the canonical works of the sages was long past and many errors had entered in and were being passed on by scholars of inferior worth, it was found that for later students there would be no correct text. Therefore in the fourth year of the period *Hsi-ping* (A.D. 175) Ts'ai Yung and others [names and titles] joined in a memorial to the emperor to have the text of the Six Classics thoroughly revised. The emperor granted the request. Ts'ai Yung then wrote the corrected text with his own hand on stones outside the gates of the state academy. Thereupon later scholars and students all took these inscriptions as standard. As soon as the stones had been set up, the people who came to see them and to make exact copies[1] were so many that there were thousands of carts every day and the streets and avenues of the city were blocked by them."[2]

The traditional interpretation of this passage is that the words here translated "make exact copies" actually refer to the making of rubbings, and that this form of printing or pre-printing goes as far back as the second century.[3] Whether this is true or not, the process certainly began early, and there is little doubt that it was earlier than the taking of impressions from wood. The earliest date that can be set with certainty is the reign of T'ai Tsung of the T'ang Dynasty, during whose reign (A.D. 627–649) a rubbing was made which was discovered by M. Pelliot at Tun-huang.[4]

The practice of cutting in stone the text of the Classics persisted, each important dynasty considering it a duty thus to conserve the results of the best textual criticism of the day. The Stone Classics of the T'ang Dynasty, of which very many rubbings were made, and which served ultimately as the model for the printing of the Classics, were set up between the years 836 and 841, and a portion of this ancient stone inscription has been recently discovered. The official history of the T'ang Dynasty records the appointment of certain officers called "makers of rubbings," whose duties seem to have been to issue authorized rubbings of the inscriptions in stone.[5]

But the discoveries at Tun-huang reveal the fact that these

Confucian texts were not the only ones that were being cut in stone and reproduced by rubbing. Parallel with the early development of block printing this sort of lithography was also going on in Buddhist monasteries—developing until whole books were being produced. The manuscript chamber at Tun-huang, that contained the earliest block printed book, the Diamond Sutra of 868, contained a copy of the very same book in the form of lithograph rubbing. The two copies, the one printed from wood, the other from stone, both date from the ninth century.[6] The stone prints found at Tun-huang make it evident that already in the ninth century the practice had begun of preparing stones with the special purpose of taking rubbings from them, and that at least as early as the first books from blocks of wood (and probably earlier) both single sheets and roll-books were thus being printed from specially prepared blocks of stone.[7]

However it was in orthodox Confucian circles and as an aid to the correct transmission of the Classics that the stone inscription and the inked rubbing had their chief importance. Even after block printing began, and had remained for a century or two locked away in the Buddhist monasteries, the rubbing from stone was still the one official and orthodox method for the reduplication of standard texts. It was the union of these two processes, the Buddhist block print (itself perhaps based on the earlier Taoist seal charm) and the Confucian rubbing, that produced the great official block printing activity of Fêng Tao's time and instituted the era—during the tenth to the fourteenth centuries—when all of China's great literature was printed. The important memorial of 932 by Fêng Tao and Li Yü, that lay back of this awakening, began, "In the time of the Han emperors Confucian scholars were honored and the Classics were cut in stone in three different scripts. In T'ang times also inscriptions of the Classics were made in the Imperial School. Our dynasty has too many other things to attend to and cannot undertake such a task as to have stone inscriptions erected. However we have seen men from Wu and Shu (Kiangsu and Szechuen) who sold books that were printed from

blocks of wood. There were many different texts, but among them no orthodox classics. If the classics could be revised and thus cut in wood and published, it would be a very great boon to the study of literature."[8]

It is thus evident that when the Confucian Classics were cut in wood—the event that marked the beginning of large scale block printing—those in charge of the work had no idea of printing, but thought they were continuing the ancient practice of cutting inscriptions, using wood instead of stone—after the analogy of certain Buddhist prints that they had seen—for the sake of ease and economy. It was thus that the wooden block and its printed impression developed naturally from the stone inscription and its rubbing. The Buddhist prints—which had developed from charms and seals—gave the idea of cutting the inscription in reverse and gave also a new technique for taking the rubbing. The stone inscription gave the official precedent.

Having thus been one of the influences that gave birth to wide-spread block printing, the use of rubbings did not cease, but continued a parallel existence. Gradually during the tenth century, the century that showed the greatest activity in the development of all duplicating processes, the emphasis veered more and more from the inscription to the rubbing made from it. In the year 992 there is a record of the making of lithograph books which contained duplicates of the autographs of the great men of the Tsin and the Wei dynasties, taken from some tombs that had recently been looted.[9] Lithography was thus the recognized method of preserving exact copies of beautiful calligraphy.[10] When the stone blocks became broken through constant use, they were mended with silver wire, the impression of which could often be detected in the rubbing. During the later years of the Sung period these lithograph books of 992 were treasured as great rarities.

Throughout the Sung Dynasty books from stone blocks continued to be published.[11] From China the art spread to Japan and in 1315 a large collection of books was there printed by this

process. The taking of rubbings still continues in China as a means of making exact duplicates of ancient inscriptions, and there is no indication that the method has materially changed from the earliest times.

CHAPTER IV

THE DYNAMIC FORCE THAT CREATED THE DEMAND FOR PRINTING, THE ADVANCE OF BUDDHISM

ART is not the only expression of human genius that has been dependent for its greatest manifestations on strong religious feeling. It can be said with equal truth that every advance into new territory made by printing has had as its motive an expanding religion. In the whole long history of the advance of printing from its beginnings in China down to the twentieth century, there is scarcely a language or a country where the first printing done has not been either from the sacred scriptures or from the sacred art of one of the world's three great missionary religions. China began by printing Buddhist pictures and texts.[1] Japan had printed for six centuries and brought the printing of books to the highest degree of perfection before the printing of anything but Buddhist sacred literature was attempted. The great mass of printed literature found in Central Asia continuing up to the time of the Mongol Conquest is almost exclusively religious, consisting of Buddhist pictures and Buddhist books. The printing that was going on in Egypt through the time of the Crusades consists of verses from the Koran and of prayers. The block printers of Europe produced biblical pictures and the *Poor Man's Bible*, while Gutenberg printed the Bible itself. And in the nineteenth century the languages of Africa and the islands of the sea have been reduced to writing and to printed form almost wholly by missionaries for the purpose of printing the scriptures. Even in China herself after the use of movable type had been almost forgotten, it was missionaries who re-introduced them to the land of their birth.

If we expect then to find a strong religious impulse back of the invention of printing in China, we shall not be disappointed. The time when all sorts of experiments were being tried in various forms of reduplication—experiments that finally led the way to printing—was the one strongly religious period in Chinese history. Under the powerful Han Dynasty that ruled China for two centuries before and two centuries after Christ, men had not felt so strongly the need of religion. Reverence for the masters of the classical age just gone by seemed to be enough. True, there are records of Buddhism in China during the first century of our era, but so long as the united empire remained, the new religion made rather slow progress. About the beginning of the third century however the Han Empire broke up, and four hundred years of anarchy set in, corresponding to the Dark Ages in Europe, and caused by that same restlessness among the populations of Central Asia that spread such terror in Europe. For four centuries war was chronic, civil war and war with the northern barbarians. This age of anarchy may be roughly divided into the time of the Three Kingdoms, when three warring Chinese Dynasties strove for the mastery; the Tsin Dynasty, when China was again rather weakly united and fighting a losing battle against the barbarians on the north; and the period of division between North and South, when north China was in the hands of various Tartar dynasties. During this time literature went backward, and the settled, rather static culture of the Han times was broken up. It was no time for the conservative virtues of Confucian society. A religion that offered a way of escape from this sinful, distressed world had more chance. Through the four centuries Buddhism steadily advanced. Everywhere, wherever there was an especially beautiful spot or a location hallowed by some sacred memory, a temple or a pagoda was built, and the religious life, the life of retirement from the world, came to be the ideal of an ever increasing multitude. A number of the pagodas of this period are still standing—among the oldest monuments we have of China's Buddhism. The age of anarchy, especially its last century, was also an age of faith.

A METAL STAMP FOR MAKING FIGURES OF BUDDHA, MARKING THE TRANSITION BETWEEN THE SEAL AND THE BLOCK PRINT

(Height 6 cm.)

Museum für Völkerkunde.

FRAGMENT OF A ROLL OF THIN PAPER WITH STAMPED BUDDHAS,
showing the Buddhist fondness for reduplication

Such rolls and fragments have been found in various parts of Turkestan in great quantities by British, French, German and Japanese expeditions (15.5 x 22 cm.)

Museum für Völkerkunde.

With Buddhism came art. Not that all Chinese art is of Buddhist origin, as has sometimes been claimed. There was an art of purely Chinese growth, that formed the foundation for the development of this and the succeeding age. But it was the new life that came in with Buddhism which touched that old art and made it great. All through the dark ages, while literature languished, art grew. For the "barbarians" who ravaged China were not the rude hordes of Attila. They had become strong Buddhists, and, as Buddhists, were the inheritors of that Greco-Indian art which had grown up in the wake of Alexander's armies. Ku K'ai-chih, the father of Chinese painting, lived in the fourth century. Through the fifth and sixth centuries most of the little dynasties that strove for the mastery have more names of artists recorded than they have years to their credit. The painters were in the Chinese South rather than in the Tartar North. Their art was Chinese. But it was the new religion, pouring in through the North and seen first in the sculptures of Northern Wei, that transfused it and gave it new life. Soon after the establishment of the T'ang Dynasty, Chinese art entered upon its greatest, most creative period. With religion had come art. With religion and art came the impulse to print.

PART II

BLOCK PRINTING IN CHINA

CHAPTER V

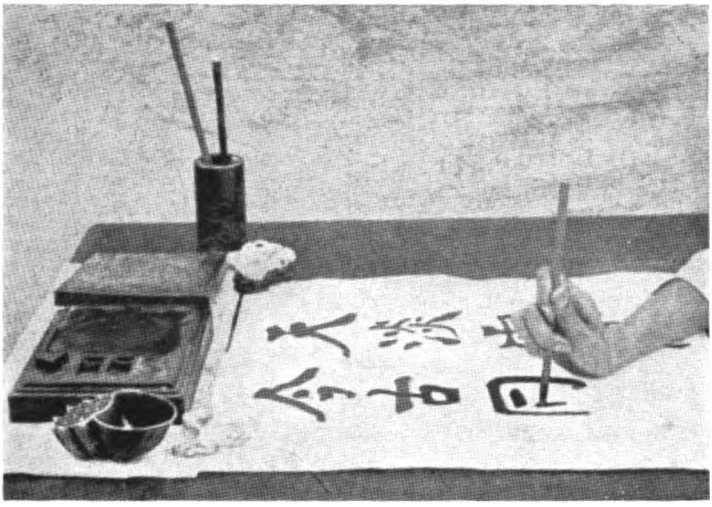
THE SIGNIFICANCE OF BLOCK PRINTING IN CHINA, THE INK, AND THE METHOD USED

EUROPE reckons the date of the invention of printing from the time when typography was invented, and considers block printing as merely an important step in preparation. The Far East reckons the invention of printing from the time when block printing began, and considers movable type as rather an unimportant later addition. This distinction lies in the difference between ideograph and alphabet. The writing of the languages of Europe is based on an alphabet: for them the invention of typography is *the* invention of printing. The writing of the languages of the Far East is based on some forty thousand separate symbols: for them, until the large wholesale printing of recent years, movable type have seldom been practical or economical. For any land *the* invention of printing is the invention of that form of printing which transforms the education and culture of the nation. China invented movable type, Korea and Japan made great use of them—all glory to the courage of the inventors who applied typography to a language of forty thousand signs when it had not yet been applied to an alphabet. But the printing on which the Renaissance of the Sung era was based, the printing which both in quality and quantity has always been preëminent in the Far East, is printing from wooden blocks. The invention of xylography then or block printing is the truly significant form of the invention for China.

Block printing in Europe was always a more or less rude art as it was at first in China, an art down among the common people, that won scant attention from scholars. When the finer work of Gutenberg appeared, the ruder art naturally came to an end. In China early block printing was equally rude. It was displaced

however not by type but by a better form of block printing. Fêng Tao, who a century or more after the beginning of block printing improved the art and applied it to new uses, is usually regarded by Chinese as the inventor of printing, and holds much the same place in Chinese history that Gutenberg holds in that of Europe. From his day printing became a fine art. The books of the Sung Dynasty have never been surpassed in printing skill. Chinese books printed from modern type cannot compare with them. In fact one reason why movable type never succeeded in displacing the block book is Chinese love of calligraphy as a fine art. In the making of pictures too the wood-engraver's art has been carried to a very high degree of perfection, especially in Japan.[1] The invention of printing from wooden blocks was therefore *the* invention of printing in China. It is the invention that by quantity production has largely transformed China's culture. It is the invention that in its quality has produced China's finest books.

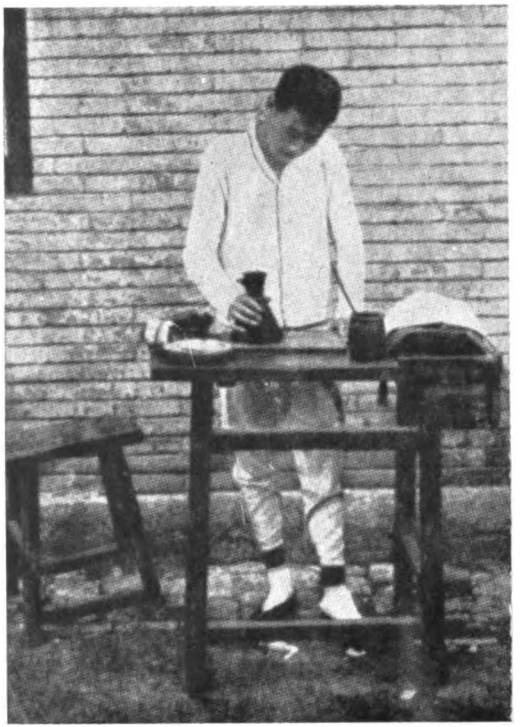
A necessary pre-requisite for printing is ink. De Vinne in his *Invention of Printing* has pointed out how large a part the discovery of an oily ink played in preparing the way for Gutenberg's invention.[2] In the same manner the way was prepared for the invention of block printing in China by the use of an ink which is known in English as "India ink," but is described more accurately by the French word, *encre de Chine*. During the classical period and up through the Han Dynasty this ink was apparently unknown, its place being taken by a material called *ts'i* or lacquer.[3] The invention of a true ink from lamp black,[4] such as has been used ever since in China both for writing and for printing, has been ascribed by Chinese writers to a man named Wei Tang, who lived in the fourth or fifth century of our era.[5] Although there have been many improvements and fancy inks described, especially by Sung Dynasty writers, there has apparently been



CHINESE WRITING

Showing the ink stick and the stone on which it is rubbed and moistened

Schreib und Buchwesen.



THE INKING OF THE PLATE FOR PRINTING

TAKING THE IMPRESSION BY RUBBING WITH A BRUSH

A CHINESE BLOCK PRINTER AT WORK

little change since Wei Tang's time in the main constituents of the ink ordinarily used.

This ink is made by placing a number of well lighted wicks in a vessel full of oil, while over this is placed a dome or funnel-like cover of iron. When this is well coated with lamp black, the lamp black is brushed off and collected on paper. It is then well mixed in a mortar with a solution of gum or gluten, and, when reduced to the consistency of paste, it is put into little moulds. The best ink is produced from the burning of particular oils, but the common and cheaper kinds are produced from fir wood.[6] This ink is sold in sticks or elongated cubes. To prepare it for writing, it is rubbed in water on a smooth ink stone.

Chinese ink is excellent for printing from wooden blocks. It makes a clean neat impression and is peculiarly indelible—so indelible in fact that on certain blocks of paper found in Central Asia, that have lain so long under water as to become petrified, the writing is still clearly legible.

The ink used in block printing, whether in China, in Central Asia, in Egypt[7] or in Europe, is practically uniform. The makers of the primitive block prints of Europe were not so accustomed to the making of this sort of ink, and most of their work has faded into a sort of brown, but the essential elements are the same. Whether this uniformity of ink indicates a line of connection, or whether it indicates merely that block printers everywhere used the ink that would make a clear impression, it is too early as yet to determine.

On the other hand, Chinese ink is not satisfactory for taking impressions from metal. It stands in globules on the metal surface and makes a rough impression. The first typographers of Europe, faced with this problem, solved it by using an ink whose pigment was dissolved in oil—after the analogy of the early oil painters. China also experimented with printing from metal blocks, and in Korea printing with metal type was done on an extensive scale. It seems probable that there too the use of an oily ink for printing from metal must have been discovered, though no

evidence of such use has yet been found. For use with wooden blocks—which constituted the great bulk of all China's printing—Chinese ink was eminently satisfactory.

There is no indication that the method of block printing has greatly changed through its long history. A description of the art as it is now carried on will give some idea what block printing in China means and has meant at least for the past thousand years—since the time of Fêng Tao.

The material used is generally pear wood. The wooden plate or block, of a thickness calculated to give it sufficient strength, is finely planed and squared to the shape and dimensions of two pages. The surface is then rubbed over with a paste or size, occasionally made from boiled rice, which renders it quite smooth and at the same time softens and otherwise prepares it for the reception of the characters. The future pages which have been finely transcribed by a professional person on thin transparent paper, are delivered to the block cutter, who, while the above mentioned application is still wet, unites them to the block so that they adhere; but in an inverted position, the thinness of the paper displaying the writing perfectly through the back. This paper being subsequently rubbed off, a clear impression in ink of the inverted writing still remains on the wood. The workman then with his sharp graver cuts away with extraordinary neatness and despatch all that portion of the wooden surface which is not covered by the ink, leaving the characters in fairly high relief. Any slight error may be corrected, as in our woodcuts, by inserting small pieces of wood. But the process is on the whole so cheap and expeditious that it is generally easier to replane the block and cut it again; for this mode of taking the impression renders the thickness of the block an immaterial point. Strictly speaking, the press of China would be a misnomer, as no press whatever is used in their printing. The thin paper receives the impression with a gentle contact,

and a harder pressure would break through it. The printer holds in his right hand two brushes at the opposite extremities of the same handle; with one he inks the face of the characters, and, the paper being then laid on the block, he runs the dry brush over it so as to take the impression. This is done with such expedition that one man can take off a couple of thousand copies in a day. Sometimes the work is divided, one man inking the block, another taking the impression. The paper, being so thin and transparent, is printed on one side only and each printed sheet (consisting of two pages) is folded back, so as to bring the blank sides in inward contact. The fold is thus at the outer edge of the book and the sheets are stitched together at the other.[8]

This is the form of printing on which the development of culture in the Far East for the past thousand years is based. It is this printing that will be considered in the next chapters.

CHAPTER VI

THE BEGINNINGS OF BLOCK PRINTING IN THE BUDDHIST MONASTERIES OF CHINA

THE period of the T'ang Dynasty (618–907)—the period during which Chinese printing had its birth—was one of the most glorious in the history of China. The four centuries of disunion and weakness—China's Dark Ages—which were roughly contemporary with the Dark Ages of Europe—had been brought to an end some thirty years before the T'ang era commenced, and under the first emperors of the new dynasty—during the seventh century and the early part of the eighth—the ancient glory of the empire was revived and enhanced. Not only China itself, but Tibet, East Turkestan, Korea and a large part of Indo-China were at one time or another brought under the control of the court at Si-an-fu, while armies were sent over the passes of the Himalayas into Kashmir against certain Indian states and over the T'ien Shan range into the region of Samarkand against the rising power of the Arabs. The early T'ang emperors of the century or more before Charlemagne did in China much the same work that Charlemagne did in Europe in restoring the old Empire on a new basis and bringing to an end the long era of chaos and disorder. But the chaos of China's Dark Ages had never been so complete as that of Europe, and classical civilization was first restored, then surpassed, far more quickly than in the western world.

The early emperors of the T'ang Dynasty were great patrons of literature, of art and of religion, and ruled over a people whose mental vision was rapidly expanding. Under T'ai Tsung (627–649), a library was erected at the capital which contained two hundred thousand volumes. At the same time China's attainment in the domain of painting was rapidly approaching its high water mark.

For impartiality in religious toleration, T'ai Tsung and his immediate followers have seldom been surpassed in history. While themselves leaning toward Taoism, and considering their family to be of the lineage of Lao-tzŭ, they were liberal patrons of Confucian scholarship, and welcomed with open hand every foreign faith. Within the space of thirty years, in the early part of the seventh century, the court at Si-an-fu had the opportunity to welcome the first Christian missionaries, to give refuge to the deposed king of Persia and his Mazdean priests, to do honor to Hsüan Tsang, the greatest of all the apostles of Chinese Buddhism, returning from India to give new impetus to the Buddhist faith, and finally to receive the first missionaries of Islam. All received the heartiest welcome. All propagated their respective faiths with the emperor's favor and help. Contact with men of many lands and of varied opinions produced an alertness, a renewing of youth in the land, such as China had never before known. Of all these faiths, it was Buddhism that took deep root, and it was Buddhism that gave to the world the art of printing.

This Augustan age lasted for more than a century. It culminated in the reign of Ming Huang (712–756) in whose time the Hanlin Academy was founded, and about whose court gathered such men as Li Po and Tu Fu, Wu Tao-tzŭ and Wang Wei, the greatest poets and the greatest artists whom China in all her long history has known.

During this golden age of Chinese genius, a great variety of devices was being evolved in the Buddhist monasteries of China for the reduplication of sacred books and texts—an activity that reached its climax in block printing some time before the end of the "golden age."

This activity in devising methods of reduplication can best be studied from the finds of Tun-huang and those of Turfan, the two places where the manuscript records of early Buddhism on the borders of China have been preserved.[1] Here are found not only rubbings from stone inscriptions, but also stencils and pounces,

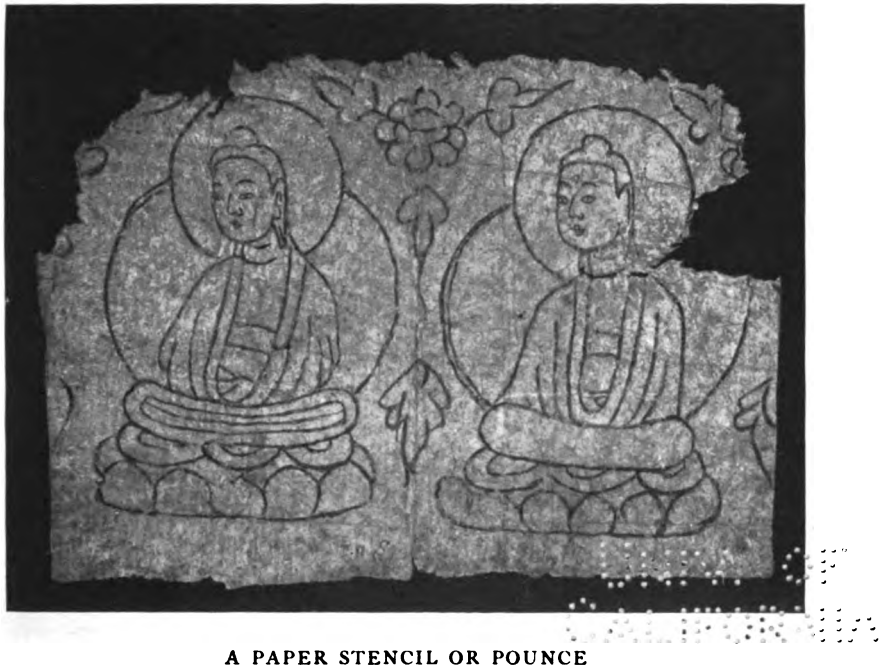
printed textiles, seals and seal impressions, and a great profusion of little stamped figures of Buddha, all of which led the way directly to the art of the block printer.

The rubbing from stone was in the main the Confucian preparation for printing. But discoveries at Tun-huang show that the Buddhists used the device too and by means of it printed one of their favorite scriptures, the Diamond Sutra.[2]

The stencil or pounce was a means of reduplication of which the Buddhist monasteries were especially fond. Several of these paper stencils have been found, with large heads of Buddha first drawn with a brush, then outlined with needle pricks like a modern embroidery transfer pattern.[3] Among the finds are also stencilled pictures—on paper, on silk and on plastered walls.

Printed textiles[4] appear in considerable number at Tun-huang. These are sometimes in two colors, sometimes in several. The designs are all conventional and non-religious, an entire contrast to all other early printing and pre-printing in the Far East. Conventionalized animal designs—horses, deer and ducks—are popular. There is also one example of design-printing on paper[5]—it looks like heavy modern wall paper with dark blue geometric design.

Small stamped figures of Buddha mark the transition from the seal impression to the wood cut. Thousands upon thousands of these stamped impressions have been found at Tun-huang, at Turfan and at other places in Turkestan. Sometimes they appear at the head of each column of a manuscript. Sometimes great rolls are filled with them—one such roll in the British Museum is seventeen feet long and contains four hundred and sixty-eight impressions of the same stamp. The only difference between these Buddha figures and true wood cuts, other than the primitive workmanship shown, is that the impressions are very small,[6] and hence were evidently made by hand pressure like the impressions from seals. The stamps found have handles for this purpose.[7] When the idea occurred to some inventive genius to turn his stamp upside down, lay the paper on it and rub it with a brush,[8] the way was open for making impressions of any size desired, and the way



A PAPER STENCIL OR POUNCE

One of the earliest devices for reduplication. The lines in the picture are pierced with fine pin pricks. Pictures, made by means of such pounces, have been found both in the Turfan region and at Tun-huang,—some on paper, some on silk, and some on plastered walls
(14 x 9.9 cm.)

Museum für Völkerkunde.

was open also for such improvement of technique as made the new invention a force in the advancement of civilization. But first it seems to have brought about only the making of better Buddha figures. One roll at London, though similar in other respects to the others, was evidently made not by stamping but by rubbing, as it shows much larger and better Buddha impressions.[9] A perfected woodcut in the Louvre shows a still further advance—a number of Buddha-figures in concentric circles of varying form and all made from one block.[10]

Such are some of the steps—rubbing from stone, printed silk, stencil, seal, and stamp—that were leading at the same time toward the block print. All these objects have been found in Buddhist monasteries, and back of all, or most of them, lies that duplicating impulse that has always been a characteristic of Buddhism. That these actual objects found at Tun-huang and Turfan are earlier than the first block books is by no means certain. None bear clear indication of date except one stone rubbing and[11] one stamp.[12] But there is every indication that those which are not themselves earlier than the first block printing, at least represent survivals of earlier and more primitive processes.

The exact date at which true block printing began is shrouded in mystery. A supposed reference to printing as having taken place under the emperor Wên Ti in 593, before the beginning of the T'ang Dynasty—a statement that has found its way into almost everything that has been written in European languages on the subject of Chinese printing—is apparently based on an error by a Chinese writer of the sixteenth century.[13] The difficulty of dating the beginning of block printing is enhanced by the fact that the evolution of the art was so gradual as to be almost imperceptible. The earliest well-defined block print extant dates from 770 and comes from Japan. The earliest printed book comes from China and is dated 868. But that printed book is a highly developed product. It is evident that the feverish activity in devising new ways of reduplication that was going on in the Buddhist monasteries of China before this time must have culminated in some

sort of block printing before 770, and long enough before that date to have been by that time carried across to Japan. Perhaps the nearest approach to an approximate date that can be given would be the reign of Ming Huang (712–756), the time when China's national greatness and China's cultural achievement reached their height.

The reign of Ming Huang ended in a disastrous revolution. The glories of the T'ang Dynasty from that time began to fade. The policy of perfect toleration for all religious faiths that marked the reigns of T'ai Tsung and Ming Huang was abandoned, and in its stead there grew up a policy of persecution of foreign faiths, including Buddhism. This persecution culminated in the famous edict of 845, through which forty-six hundred Buddhist temples were destroyed and two hundred and sixty thousand Buddhist monks and nuns forced to return to lay life.[14] It is owing to this destruction of temples, as well as the civil wars of the last century of the T'ang Dynasty, that most of the great works of art of the T'ang period have perished. It is doubtless due to the same cause that no Chinese printing earlier than the Diamond Sutra of 868 has survived, and that for the earliest extant block prints it is necessary to turn to Japan.

CHAPTER VII

THE EMPRESS SHOTOKU OF JAPAN AND HER MILLION PRINTED CHARMS

C. A.D. 770

FOR a century and a half before the making of the first block printed charms, Japan had been undergoing a process of complete transformation under the influence of China.[1] It was a period similar to that which Japan passed through during the latter half of the nineteenth century, except that China was the model instead of the West. A steady succession of Buddhist missionaries from China poured into Japan, and a steady succession of Japanese students went to China for study and on their return brought about sweeping changes in the customs of their native land, bringing Japan gradually abreast of what was then the world's most cultured country. In 701 the annual celebration in honor of Confucius began, and in 708 the first mint was established for the making of coins in Japan. In 735 a Chinese scholar became head of the newly established university at Nara, Japan's new capital, which was seeking in every way to mould itself after the pattern of the Chinese capital at Si-an-fu. In the same year Kibi-no-mabi returned from Si-an-fu after nineteen years of study, and, entering into the service of the government, introduced all sorts of Chinese customs. To him is ascribed the invention of Kata-kana, the Japanese syllabary or script. He was the tutor of the empress Shotoku, by whose order the first recorded block printing was done.

A recent Japanese writer has given the following account of the zeal with which Japan was at this time adopting Chinese ways: "During the eighth and ninth centuries there was scarcely anything good in Si-an-fu, the great T'ang capital, that was not introduced into Japan or copied by the Japanese in their capital at

Nara sooner or later. If the court buildings at Si-an-fu were painted red, so were those at Nara. If a temple was built and supported by the Chinese government in each province, so must it be in Japan. If the birthday of the Chinese emperor was observed as a national holiday, so was it here. If the nobles and the upper class in the Chinese capital played football, it was soon imitated by the Japanese aristocracy in Nara. . . . We can trace all this back to the Chinese origin of Japanese Buddhism."[2]

In Japan as in China, block printing was preceded by the use of seals. As early as the year 629 reference is made in the *Nihongi* to the imperial seal.[3] In 704 official seals for the provinces were established, and it was stated that they were to be two *sun* square (a little more than two inches).[4] In 739 a seal of the same size was granted to the Ise shrine. These seals without doubt followed the fashion that was already in use in China and were used for making impressions with ink. That some of them, at least, were made of wood is indicated by the statement in the *Nihongi* that in 692 the office of the Shinto cult gave a wooden seal to the empress.

Japan, the country that has never been conquered, is remarkable for the careful way in which ancient antiquities have been preserved. This is particularly true of the town of Nara, where the capital was established from 710 to 784, and where a large variety of objects from this "Nara Period" have been kept.

Among the precious objects preserved at Nara are a number of pieces of printed silk fabric which were apparently made by the use of wooden blocks. The patterns include plants, flowers, willow trees, pheasants, small birds and butterflies. Two of the pieces of silk have the date printed into the design—dates corresponding to the years 734 and 740.[5] Printed textiles[6] are mentioned in the *Shoku Nihongi*[7] under the date of 743.

Armor belts of leather with designs in blue, red and purple dye printed upon the leather, were produced at various times in the provinces of Hisen and Higo in the southern island of Kiushu, and some of them have been preserved. One is dated the eighth month of the twelfth year of the period Tempyo, which corresponds to

740. It is even more close to being a true block print than are the textiles, for the printing includes not only design but also a picture of the divinity Fudo and a number of words in Chinese and Sanskrit as well as the date.[8]

During the whole of the Nara period (710–784) the control of the Buddhist hierarchy over the affairs of the empire was very strong. The resources of the state were drained for the casting in 732 of the forty-nine ton bell—the fourth in size in the world—and for the erection in the years 735–749 of the great bronze statue of Buddha at Nara, weighing over five hundred and fifty tons and covered with fifty pounds of gold. The priest Gembo, who returned from China in 736 after a nineteen years' stay, and who brought back with him five thousand Buddhist books and many holy images, had a large share in managing the affairs of state until his death in 746. But it was under the empress Shotoku, who reigned, with interruptions, from 748 to 769, that priestly control reached its climax. This empress, remembering the terrible smallpox epidemic of 735–737, kept a hundred and sixteen priests attached to her court for the driving out of disease demons, in addition to those employed for other purposes. Dokyo, the head of the Buddhist priesthood, was her chief physician and adviser and had a controlling voice in all state decisions. He was emperor in everything but name, was even given several of the titles usually reserved for the emperor, and was lodged in the palace.

To the zeal for Buddhism of the Empress Shotoku, the world owes its first certain and clearly attested record of printing with wooden blocks upon paper.[9] The empress ordered the printing of one million charms to be placed in a million tiny wooden pagodas, and some time about the year 770 the work was finished and the pagodas and the charms distributed.[10] This event, so important in the history of the world, rests fortunately on as clear evidence as any event in early Japanese history. It is described both in the dynastic annals and in the records of the temple where many of the prints were deposited; and, more than that, a number of the original prints are still extant.

The account in the official history, the *Shoku Nihongi*,[11] is as follows: "In the fourth month of the year 770,[10] after the eight years of civil war had been brought to an end, the empress made a vow and ordered the production of one million three-storey pagodas, four and a half inches high and three and a half inches in diameter at the base. Within these were to be placed the following *dharani* charms [here follow the names of the six charms]. When this work was finished, they were distributed among various temples." The record in one of the temples[12] is more explicit with regard to the means by which the charms were made: "In the year 767[10] there were built two small halls for pagodas on the east and west sides of the temple. . . . There were made one million pagodas, which were divided among the following ten temples [names of the temples]. In each was preserved a charm (*dharani*) from the *Muku Jō-kō Sutra* in block print."[13]

Not only have we these two clear contemporary accounts of the printing of a million charms. We have also the charms themselves. A number of the original impressions are preserved in the Hō-riu-zi[14] monastery in the province of Yamato, together with the little pagodas in which they were contained. The British Museum also has in its possession three charms and the museum at Leipsic one. The charms are about eighteen inches long by two wide. Each one contains about thirty columns of five characters each. They are not all alike, as six different charms were printed.[15] Two different kinds of paper were used, one thick and of a woolly texture, the other thinner and harder, with a smooth surface, which did not absorb the ink quite so readily. All the charms on both kinds of paper are brown with age. Whether the blocks used were of wood or of metal is still uncertain,[16] but they were probably of wood.

The text of these earliest block prints and of the whole Sutra from which they are taken indicates clearly the incentive that was back of their production, and sheds light on the powerful impulse that Buddhism gave to early printing. This Buddhist Classic, known in Sanskrit as the *Vimala Nirbhasa Sutra*,[17] consists of six

sections, each of which in turn contains a narrative portion and a charm, the narrative portion indicating the use of the charm. When in 705 the Sutra was translated into Chinese by Mi T'o-shan—sixty years before the printing of the charms in Japan—only the narrative portions were translated. The charms were merely transliterated, the Sanskrit sounds being represented as nearly as possible by Chinese characters. It is these Sanskrit charms in Chinese characters that were printed and rolled up and placed in the wooden pagodas. A small section from the narrative portion of the Sutra, which forms as it were the introduction to the charms, is enough to indicate how this printing naturally fitted into the Buddhist scheme of salvation: "A Brahmin who was sick went to visit a seer in a garden. The seer said, 'You must die in seven days.' So he went to Buddha, pleading that Buddha would save him, and offering to become his disciple. Buddha said to him, 'In a certain city a pagoda is fallen. You must go and repair it, then write a *dharani* (charm) and place it there. The reading of this charm will lengthen your life now and later bring you to Paradise.' The disciples of Buddha then asked him wherein the power of the *dharani* charm lay. The Buddha said 'Whoever wishes to gain power from the *dharani* must write seventy-seven copies and place them in a pagoda. This pagoda must then be honored with sacrifice. But one can also make seventy-seven pagodas of clay to hold the *dharani* and place one in each. This will save the life of him who thus makes and honors the pagodas, and his sins will be forgiven. Such is the method of the use of the *dharani*. . . . The size of the pagodas shall be from an inch to a cubit in height or yet ten feet. From these pagodas, if the heart is set at rest by contemplation, shall come forth a wonderful perfume.' The Boddhisattva said, '. . . I will speak of the impressing of the law of the *dharani* upon the heart. This *dharani* is spoken by the nine hundred and ninety-nine thousand Boddhisattvas, and he who repeats it with all his heart shall have his sins forgiven. . . . So shall ninety-nine copies be made of each of these *dharani*, and they shall be placed within the pagodas. . . . These shall be

honored with offerings and incense and flowers and there shall be a procession around them seven times while the *dharani* is recited. Then will great salvation be wrought.'"

In the face of the discrepancy in numbers between the directions given by Buddha and by the Boddhisattva, the empress evidently tried to be on the safe side and ensure long life by ordering a million copies of the charm—and by so doing, she introduced printing to the world. The immediate purpose of her project failed, for she died about the time the pagodas were distributed, but the by-product of her act became one of the world's greatest civilizing forces. It is typical of the international character which printing has always possessed that this first printing project was in an Indian language in Chinese character and carried out in Japan.

In 782, thirteen years after the empress' death, the great emperor Kwammu moved the capital away from Nara in order to escape the domination of the Buddhist hierarchy, and the period of the domination of the state by the church was at an end. For two hundred years Japanese history is silent on the subject of printing—till the year 987, when it entered Japan once more as an importation from China. But meanwhile printing in China itself had undergone a transformation.

THE WORLD'S OLDEST PRINTING

Buddhist charms printed by the Empress Shotoku of Japan about the year 770, in the Sanskrit language and in Chinese character, and deposited by her in various temples, where many of them still remain (6 x 46 cm.)

British Museum.

THE CAVES OF THE THOUSAND BUDDHAS AT TUN-HUANG

Where the earliest printed book, the Diamond Sutra of 868, was found

CHAPTER VIII

THE FIRST PRINTED BOOK

The Diamond Sutra of 868

A GLANCE at the map of China will show a slender arm of the province of Kansu—a peninsula, so to speak—extending far out into the desert of Turkestan. The historical reason for this peninsula of Chinese civilization is the great trade route and military road, along which a narrow line of Chinese settlements grew up, extending far into the Northwest. Here on this "panhandle," as it would be called if it were in America, lies the city of Tun-huang, near which are the Caves of the Thousand Buddhas. While in China itself, on account of the climate, very few manuscripts of ancient date have been preserved, Eastern Turkestan has a climate like that of Egypt which preserves intact all that is buried beneath its sands. Turkestan is therefore one of the world's great treasure houses of archaeology, and in the Caves of the Thousand Buddhas, in a region that combines the cultural heritage of China with the climate of Turkestan, there has been found the greatest store of ancient Chinese manuscripts that has yet been unearthed.

The setting in which the manuscripts of Tun-huang have been found is unique. Cut into the rock in the side of a cliff are a very large number of caves, some of which have served continuously as Buddhist shrines for more than fifteen hundred years. Several of these caves are very large, and two of them contain colossal images of Buddha, each ninety feet high. A stone inscription in one of the caves, itself dated A.D. 698, describes the founding of this cave colony in the year 366.

While the whole series of caves is of archeological interest, the supreme interest for our study lies in the sealed manuscript chamber. This was discovered in the year 1900 by a mendicant

Taoist priest, who had by begging collected money for the pious act of restoring one of the caves to its ancient magnificence, and who was actually engaged in beautifying (as he thought) one of the early frescoes. In so doing he found that the plaster of a part of one of the frescoes was laid on a background not of stone but of brick. Removing a bit of the fresco, and cutting into the brick, he found behind it a secret walled-up chamber piled high with manuscripts. How Dr. Stein on his visit to Tun-huang seven years later learned of the secret chamber, obtained access to it, and finally was able to transport a part of its contents to India and to the British Museum, is told in a vivid narrative in the second volume of Serindia.

The chamber proved to be about nine feet square and piled solid some ten feet high with the precious manuscript rolls. Examination showed that the dates ranged from the beginning of the fifth century to the end of the tenth.[1] There is good reason to believe that this chamber was walled up about the year 1035, in order to prevent its contents falling into the hands of enemies, and that it was so effectually sealed that its existence was altogether forgotten until it was rediscovered in 1900. The manuscripts within were in almost as good condition as if written yesterday, though the whole library of fifteen thousand or more books—all written on paper—was closed and sealed a century before the first introduction of paper into Europe.

Within this small room were piled 1130 bundles, each carefully sewed up in cloth and each containing a dozen or more manuscript rolls. Of these Dr. Stein succeeded in purchasing from the Taoist priest and in transporting to London some three thousand rolls, together with five or six thousand detached pieces and fragments. The next year Prof. Pelliot, the famous French sinologist, visited the cave and procured for France about an equal number. These books are in the main Chinese. There are however many rolls in Tibetan and a certain number in Sanskrit, Sogdian, Eastern Iranian and Uigur (Turkish), and even a book of selections from the Old Testament in Hebrew.

It was among the manuscripts of this ancient library, sealed up nearly nine hundred years ago, that the world's oldest printed book was found.[2] This book, which is almost perfectly preserved, shows already an advanced technique, behind which there must have been a long evolution. It is less crude than any of the European block printing of pre-Gutenberg days. The book consists of six sheets of text and one shorter sheet with woodcut, all neatly pasted together so as to form one continuous roll sixteen feet long. Not only the excellent technique, but the size of the sheets as well, shows that this is no primitive bit of printing like the charms from Japan. Each sheet is two and a half feet long by nearly a foot wide, indicating the large size of the blocks used. At the end, printed into the text, is the statement that the book was "printed on May 11, 868, by Wang Chieh, for free general distribution, in order in deep reverence to perpetuate the memory of his parents."[3]

Of Wang Chieh nothing is known except this statement, which tells us that he was the first printer of books of whom the world has record. It is possible however to see something of his motive in undertaking this printing project. The Diamond Sutra,[4] the section of the Buddhist scriptures which appears in this roll, was a favorite book with early printers, whether in China, in Japan or in Central Asia. It consists of a number of discourses by the Buddha to his aged disciple Subhuti on the subject of the non-existence of all things. While it is taken up in the main with very abstruse teachings, the author has a very high opinion of the importance of the book that he is writing. Over and over again the Buddha is represented as describing to Subhuti the infinite merit and rewards to be gained by him who transcribes the book and thus spreads abroad its doctrine. "Whatever place," he says, "constitutes a repository for this sacred scripture, there also the Lord Buddha may be found." "If a good disciple whether man or woman, in the morning, at noonday and at eventide, sacrificed lives innumerable as the sands of the Ganges, and thus without intermission throughout infinite ages; and if another disciple,

hearing this scripture proclaimed, steadfastly believed it, his felicity would be appreciably greater than the other. But how much greater must be the felicity of a disciple who transcribes the sacred text, . . . and repeats the scripture that others may be edified thereby." [5] The transcription of the sacred text of the Diamond Sutra became a favorite method of acquiring merit among Buddhists, and so it still remains. I have known a Chinese student at Columbia University who, on the eve of his coming to America, made a vow that, if his mother should be cured of a serious illness, he would transcribe five copies of the Diamond Sutra. His mother recovered and he fulfilled his vow. It is easy to imagine the pious delight of Wang Chieh in the new invention that enabled him to transcribe not five copies but a multitude of copies for free general distribution, in order to do honor to his parents.

The printing of books did not however immediately supersede the making of manuscripts, even among the Buddhists. For though the manuscripts of the Tun-huang cave did not come to an end for nearly a century and a half after the time of the Diamond Sutra, there were found among the great mass of manuscript rolls only three other printed books in roll form [6] and one small folded book.

The making of single-page block prints would seem to have progressed rather more rapidly than the making of books, judging from the fact that several score of these were found at Tun-huang. They are of various forms, but all religious. The larger number are either votive offerings or charms. The votive offerings are the more numerous and include many duplicates. While it was evidently the custom for people of wealth to present paintings at the shrine in payment of vows, and many of these paintings have been preserved, each one with a picture of the donor at the base, it seems that those who could not afford a painting wanted something that could be produced more cheaply—and so these prints came into being. They are usually about a foot high by seven or eight inches wide. The top half is a picture of the Goddess of

THE WORLD'S OLDEST PRINTED BOOK—THE DIAMOND SUTRA OF 868

Printed by Wang Chieh. Found in 1907 by Sir Aurel Stein. The roll is sixteen feet long by one foot wide, and is made up of seven sheets pasted together

British Museum.

A BLOCK PRINT PRESENTED IN PAYMENT OF A VOW AT ONE OF THE SHRINES IN THE CAVES OF THE THOUSAND BUDDHAS

Date about 950
(31 x 20 cm.)

British Museum.

Mercy or some other divinity. The lower half consists of text, usually an ascription of praise. Sometimes the whole sheet appears to have been printed from one block; sometimes it is clear that the picture and the text are from separate blocks. A few of these votive offerings are hand-colored and present an appearance strikingly like the early image prints of Europe. Several of them still have tabs pasted at the top for hanging them on the wall.

A number of the prints from Tun-huang are charms, and of these there is considerable variety. The text is always Sanskrit or a cabalistic script allied to Sanskrit, with some words of explanation in Chinese. One of them is marked as having power to blot out sins—not so far removed in idea from the Latin Indulgence which was one of the first things printed by Gutenberg. Akin to the charms is a calendar, illustrated by many woodcuts, and containing full information about lucky and unlucky days.

One roughly printed little Buddhist sutra is of interest as marking the transition to a new form of book. It is not a roll, but a tiny folded book, one of the first of its kind. Chinese records tell us that books first took the form of rolls when writing on silk began, a century or two before Christ, and that this form of book continued after the invention of paper and down to the end of the T'ang Dynasty, when, under the influence of printing, paged books began to appear.[7] A transition stage between the roll and the stitched book was the folded book, a continuous piece of paper like the roll, but folded in pages like a modern railroad time table. This little sutra is such a folded book. It consists of eight pages. It is printed like all block prints on one side only, then folded, and finally has the folds at one edge all pasted together, so that it opens quite like a modern book. The feeling of modernness is enhanced, when one sees the name of the printer and the date clearly printed on the inside of the outer sheet. The date is 949.

While the Diamond Sutra bears the date of 868, and the three other roll books found at Tun-huang have all been assigned with a fair degree of probability to the ninth century or the opening

decade of the tenth,[8] those of the single sheets that bear dates, as well as the folded book just described and a seven-page charm from Paris (excluding duplicates there are altogether nine books and sheets bearing dates [9]) range from 947 to 983. On the other hand these sheets are far more primitive than the rolls. This fact leads to the suggestion that the books were importations, probably from the province of Szechuen, while the single sheets were of local manufacture.[10] If this is the case, it is not unlikely that these votive offerings and charms represent survivals in this far western outpost of a form of printing which in China proper had already preceded the Diamond Sutra, and that they make it possible to reconstruct still further the development that led up to the printing of that book.

Meanwhile from an entirely different set of sources comes documentary evidence that parallels the evidence of archeological discovery. The first [11] clear reference to block printing in Chinese literature is an account of printed books which were seen by the official Liu Pin [12] in the province of Szechuen in the year 883, just fifteen years after the appearance of the Diamond Sutra. Liu Pin accompanied the emperor Hsi Tsung into temporary exile in Szechuen during the troubles that were rife during the last years of the T'ang Dynasty. His statement reads, "In the summer of the year 883, during my three years sojourn with the emperor in the province of Shu (Szechuen), I was examining books on the south-east side of the imperial residence on behalf of an official named Hsün Hsiu. These books consisted mostly of works on divination,[13] portents, dreams and *fêng-shui*, and writings of the *Chiu-kung* [14] and Five Planet sects; but there were also some 'character books' [15] and elementary school books. Most of these books were printed with blocks on paper, but they were so smeared and blotted that they were not readily legible."[16]

This earliest clear description of Chinese printed books brings out several important facts. It is evident that printing was confined to non-canonical works, and in the main to the books of the ignorant and the poor, to whom the cheapness of the new

method appealed. It is also clear that Taoists as well as Buddhists were making use of the new art, and that though their work was still crude, it had progressed far since the days of the charm-seals described in chapter two.

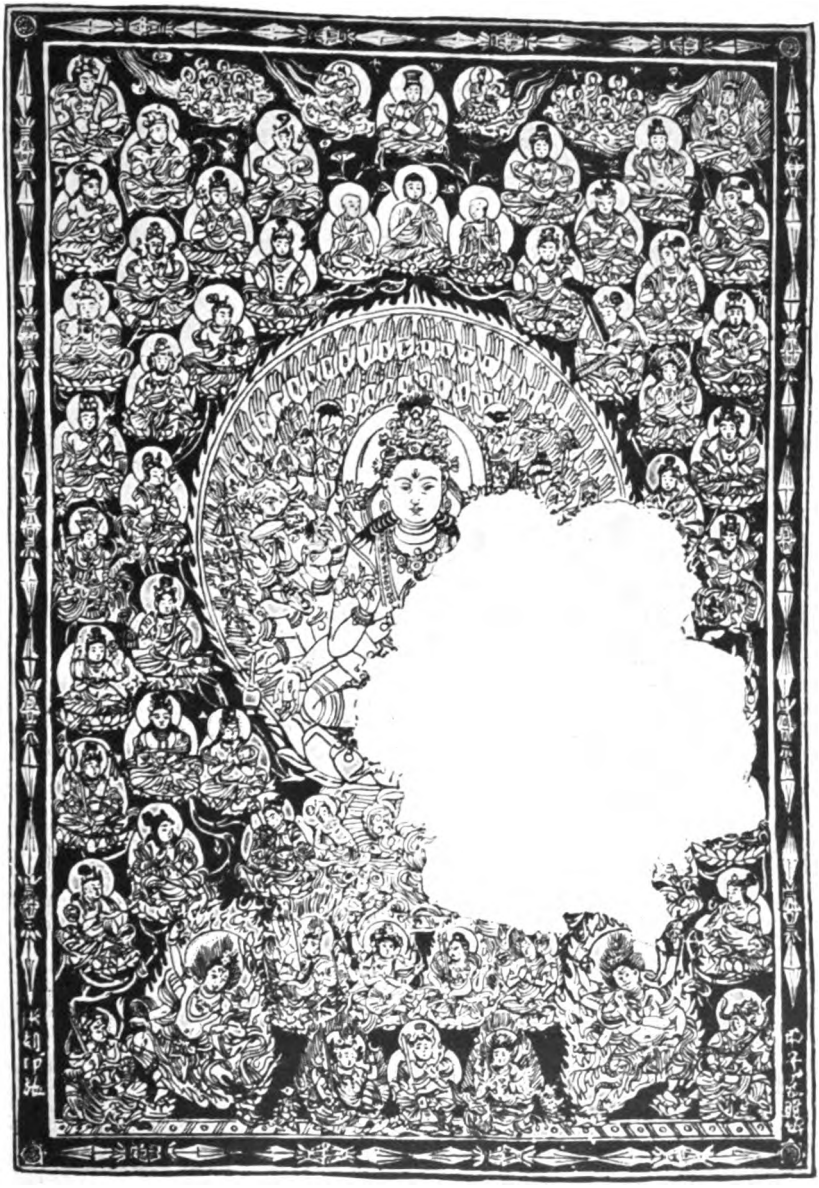
But "there were also some character books and elementary text books." Here may be seen the beginning of the emergence of the art of printing from the realm of Buddhist lore and Taoist magic. Not till printing began to emerge into the secular field did it find its way into literature, for the Confucian historians—those who were chiefly interested in the progress of civilization—had a wholesome contempt for what was going on behind the doors of monasteries. It is not without significance that Liu Pin was usually ignored by Sung and Yüan writers who tried to trace the origin of printing, and that when he was quoted, the "books of divination, dreams and portents" were omitted and only the "character books and school books" remained. It is these latter that prepared the way for the great advance of the next century—the printing of the Confucian Classics.

There are two other early authorities who mention printing in the T'ang Dynasty, and both of them, like Liu Pin, locate the centre of the industry in the province of Szechuen, then known by the name of Shu.[17] Chu I,[18] a careful writer of the Sung Dynasty, is authority for the statement, "Inked blocks were first used at I-chou [19] (Ch'eng-tu) at the end of the T'ang Dynasty." The *Kuo-shih-chih* [20] confirms this statement, and adds, "The books printed were usually books on magic art, school books and character books."[21]

Some leaves of a dictionary [22] found at Tun-huang are believed to have been produced by this early secular printing activity of Szechuen. They are not dated, but there are certain indications that have led M. Pelliot to assign to them a date of about 900. They are almost the only bits of non-Buddhist printing that have been found at either Tun-huang or Turfan.

Although Buddhist printing was already highly developed during the ninth century, as indicated by the Diamond Sutra, the art

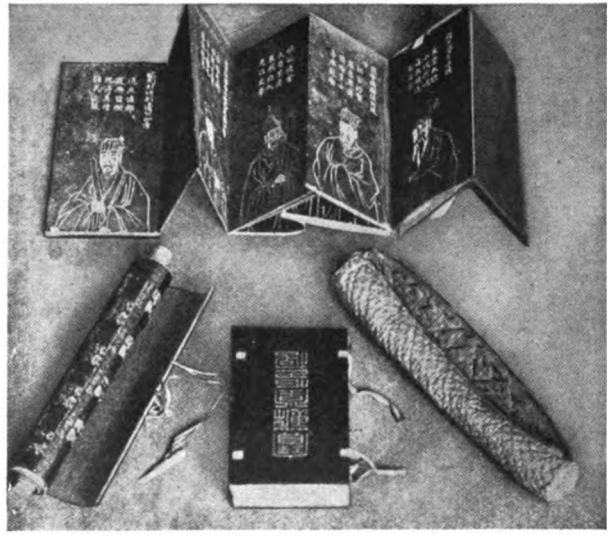
of printing had still awakened little interest in the empire at large, and as late as 932 it was still confined to two localities, of which Szechuen was one. The printing activities of T'ang times made little impression upon the Chinese world. Fêng Tao, whose publication of the Classics occupied the years 932–953, just after the T'ang Dynasty came to a close, has almost universally been regarded in China as the inventor of printing. Only a few writers have pointed out the earlier printing that formed the foundation of this work, and not until the discovery of the Diamond Sutra in 1907 was anything definite known of the character of that early printing.



A TENTH CENTURY WOODCUT FROM TUN-HUANG IN WHICH MANY SMALL BUDDHA FIGURES, SUCH AS WERE FORMERLY PRODUCED BY METAL OR WOODEN STAMPS, ARE PRINTED TOGETHER FROM A SINGLE BLOCK

(33 x 51 cm.)

The Louvre. Salle Pelliot.



THE EVOLUTION OF THE CHINESE BOOK

Lower right hand corner: The silk roll, which was in use in the Han Dynasty, from about B.C. 200 to A.D. 100.
Lower left hand corner: The paper roll, which was in use from the second century to the tenth.
Above: The folded book, the use of which began in the ninth or tenth century, and has continued for Buddhist literature down to the present.
Bottom row, center: The stitched book, introduced probably from the west in the tenth or eleventh century, and still in general use. Various bindings have been used. The binding here shown is wooden boards.

Schreib und Buchwesen.

CHAPTER IX

THE PRINTING OF THE CONFUCIAN CLASSICS UNDER FENG TAO

932–953

(PERIOD OF THE FIVE DYNASTIES, 907–960)

UP TO the end of the T'ang Dynasty, the Empress Shotoku of Japan had printed a million charms to insure length of days, and Wang Chieh had printed the Diamond Sutra to honor his parents. This, together with Liu Pin's record of printing in the province of Szechuen, constitutes all that is known definitely of block printing up to the beginning of the tenth century. The next great name in this history is that of Fêng Tao, who as prime minister ordered the printing of the Confucian Classics.

It is necessary first to see the background of Fêng Tao's work, and for that background to turn again to West China, to the province of Szechuen. During the whole T'ang Dynasty the cultural center of gravity in China was rather in the West than in the East, as much of the greatness of the empire was due to its relations with peoples beyond the western border. The T'ang capital was at Ch'ang-an or Si-an-fu in Shensi. The Chinese culture which entered Japan was the culture of Si-an-fu, for Japanese students, seeking to learn what China had to teach, passed by the eastern provinces and studied in the Western Capital.

As the T'ang Dynasty neared its close, there was a tendency for this cultural center to move still farther west. In 881 the emperor, pursued by rebels, moved to I-chou, now Ch'eng-tu, the capital of Szechuen. Though he resided there only five years, his presence gave to the people a feeling that theirs was the imperial city—a feeling strengthened by the fact that a new city wall, eight miles in circumference, had just been built, with the labor of a hundred

thousand men. It was during the Emperor's sojourn in I-chou (Ch'eng-tu) that Liu Pin saw printed books exposed for sale in that city, and described them—the first mention of printing in Chinese literature. After the emperor's return to Si-an-fu, one of the generals who had loyally received him in Szechuen, gradually made himself more and more master of the western province, until in 907, when the T'ang empire fell, he was able to proclaim himself independent, and to call his state (which comprised the province of Szechuen and certain border districts of surrounding provinces) the "Empire of Shu."

The history of the rest of China during the next half century, known as the period of the Five Dynasties, is a story of constant civil war, one dynasty following another in rapid succession at Si-an-fu, and each ruling over only a circumscribed area. During all this time—except for one short break, from 929 to 934—the so-called "Empire of Shu" in the far west remained independent, and was the most prosperous, and doubtless also the most highly cultured part of China.[1]

The history of Szechuen or Shu through this period is important to the student of printing for a number of reasons. It was there, at I-chou (Ch'eng-tu) the capital, according to certain of the earliest authorities, that printing began; it was certainly there that non-Buddhist printing began and that printing was first mentioned in literature;[2] it was probably in Shu that the first official printing took place, both the printing of books and the printing of paper money;[3] and, finally, Fêng Tao, though regarded by later generations as the inventor of printing, himself stated that his printing was based on the work that he had seen in Shu.

When the state of Shu attained its independence in 907, one of the first acts of its new ruler was to have the corrected text of the Classics (or at least a part of them) engraved on stone in the new capital—in imitation of work done by the great emperors of the Han and T'ang dynasties.

The rapid advance of printing from wooden blocks in the state of Shu during the next half century is largely due to the efforts of a

far-sighted statesman by the name of Wu Chao-i.[4] Wu's early interest in printing is thus described by a writer of the Sung Dynasty: "When Wu Chao-i was poor, he wished one day to borrow some books from a friend. The friend showed by his look that he did not wish to lend them. Wu was grieved and said, 'Some day, when I come into a position of power, I shall have books cut in blocks, so that all scholars may have the opportunity of reading them.' When later he served the king of Shu as prime minister, he fulfilled his promise. This was the beginning of printing."[5] In other words, this was probably the beginning of official printing, undertaken by the state. Another writer tells of Wu's interest in education: "From the end of the T'ang Dynasty all schools had been in ruins. Wu Chao-i of Shu from his own private funds contributed a very large sum (lit., millions) to reëstablish them. Besides this he petitioned the king to have the Nine Classics printed. The king granted his petition. From this time there was a literary renaissance in Shu."[6]

Meanwhile back nearer the center of the country, with their capital at Ch'ang-an or Si-an-fu, one dynasty was succeeding another on the ruins of the old T'ang empire. The second of these so-called "Five Dynasties," known as Later T'ang, was able to gain considerable strength in Central China under the able administration of the prime minister Fêng Tao—one of those strange figures in history who succeed in winning and retaining the good will of various persons in spite of the enmity of those persons to each other. Under four of the "Five Dynasties" and under seven emperors,[7] Fêng Tao held his position, and thus a semblance at least of continuity was attained in the conduct of the empire, for each founder of a short-lived dynasty, though killing his predecessor, was wise enough to retain his predecessor's chief adviser.

In the year 929, near the beginning of Fêng Tao's career, and near the beginning of the career of his rival, Wu Chao-i, the central empire in which Fêng held authority conquered the state of Shu and held it for five years. As the imperial authority was extended over that new territory, two things were found in the far

western capital that Fêng Tao was quick to seize upon and adapt to the use of his own growing empire, the Classics engraved in stone—hitherto an imperial prerogative—and the new and as yet little known process of block printing. That the prime minister and his associates quickly saw the necessity of the central empire taking over this work from its newly conquered province, is indicated in the epoch-making memorial of 932, issued just three years after Shu was added to the imperial domain and two years before it was again lost.

"During the Han Dynasty," they wrote in their memorial, "Confucian scholars were honored and the Classics were cut in stone. . . . In T'ang times also stone inscriptions containing the text of the Classics were made in the imperial school.[8] Our dynasty has too many other things to do and cannot undertake such a task as to have stone inscriptions erected. We have seen, however, men from Wu [9] and Shu who sold books that were printed from blocks of wood. There were many different texts, but there were among them no orthodox Classics. If the Classics could be revised and thus cut in wood and published, it would be a very great boon to the study of literature. We, therefore, make a memorial to the throne to this effect." [10]

Printing was evidently the last thing that Fêng Tao and his associates were interested in. It came as a by-product. Their whole interest lay in fixing forever the canon and the correct text of the Classics, a prerogative that they felt belonged to them, as representations of the real empire, and not to the upstart "empire" of Shu. They believed that recent scholarship had thrown new light on certain questions of textual criticism which rendered the text current in Han and T'ang times obsolete, that for this reason the whole text needed a thorough searching revision, *and that their empire must be the one to set the standard.* The material on which the revised text was to be cut was incidental. In fact the cutting in wood instead of stone was regarded as a makeshift, the impoverished state having no money to cut the text in stone as previous dynasties and as the rival state of Shu had done.

This emphasis on sound scholarship in getting at the correct text is brought out in the emperor's reply and in the arrangements that were made for the work. The Kuo-tzŭ-chien, or National Academy, where leading scholars of the empire were gathered together, was ordered to select for each one of the Classics a commission of five or six specialists in order to revise the text. A government board headed by a scholar named Ma Kao was appointed to examine and revise the work of these commissions, "and since the establishment of the text of the Classics is of great importance," the decree ran, "an importance not to be compared with that of all other books, although I have already ordered the National Academy to appoint officers to edit the work, yet, because the work is so vast, and I still fear that errors may creep in, I order Ma Kao and the men with him (who are all great scholars and each one a specialist in the Classics), to make a final, exact examination in order that everything may be brought to absolute perfection." The Academy was then ordered to select skilled calligraphers to prepare the final copy which should be fixed to the blocks for cutting, and finally to select careful workmen to cut the blocks. At the head of the calligraphers, the famous writer Li O was chosen, while T'ien Min, as director of the National Academy, was appointed to be head of the whole undertaking.[11]

The work of editing and of printing lasted for twenty-one years, twenty-one years of civil war, during which four dynasties, three of them founded by Turkish or Uigur adventurers, followed one another in rapid succession. But somehow or other Fêng Tao retained his post as head of the civil administration, while T'ien Min and his associates worked steadily on at the task of editing and printing the Classics. To those who are acquainted with the China of our own day, and have seen government education steadily pushing forward in spite of governmental anarchy, it is not hard to understand how the National Academy and the various commissions appointed went their quiet way unruffled by the storm that was beating about them.

Several state documents have been preserved indicating the

progress of the work and the difficulties met. None is of especial interest until the final statement made by T'ien Min in 953 in presenting to the emperor the completed edition of the Classics and their Commentaries [12] in one hundred and thirty volumes: "From the third year of the period *Chang-hsin* (932)," he declared, "we have been at work on the revision and printing of the Nine Classics and their Commentaries. The Classics and their Commentaries are so voluminous and come from such an ancient time and so many errors have crept in through frequent copying that in many cases the original reading has been lost. Our function has been to superintend the work of the National Academy and to watch over the revision of the books. We have sought in all things to find the correct standpoint for fixing the text and to prepare everything perfectly for printing. Fortunately through the favor of your Majesty we have been able to bring the great work to completion. Through this work the virtues of peace will be spread abroad and the universal doctrine made eternal. We respectfully submit our finished task." [13]

Meanwhile the printers of Szechuen were not inactive. Wu Chao-i's initial work, which had inspired Fêng Tao to competition, was followed by the printing of at least a part, if not the whole, of the Nine Classics. The records of this official printing of the state of Shu are very meager, compared with the full records of the work of the central empire under Fêng Tao, but it is probable that the Classics in whole or in part were published in Shu at about the same time that they were published in the imperial capital—one authority says in the same year.[14]

Yet with all this printing activity both in Shu and in the central empire, the old idea of authentication still clung to that word *yin*, that had meant seal and now meant print. The chief purpose of printing was not yet to make literature more accessible to the masses, but rather to authenticate the text. For more than a century after Fêng Tao—up to the year 1064—the private printing of the Classics was forbidden. All printing must be done by the government and must give the orthodox accepted text.

Of the Classics printed under Fêng Tao's administration, nothing of undisputed genuineness has come down to us. There is an old edition of the *Er-ya* in Japan which is marked as "written by Li O," the calligrapher who wrote the copy for Fêng Tao's work. While this is probably a Sung Dynasty reprint,[15] it is likely that it reproduces fairly faithfully the original and gives an idea what the Classics printed by Fêng Tao looked like. It is in the form of a book with pages but each page conforms closely to the style of the pasted sheets of the T'ang manuscript rolls. Each half page contains eight columns, and each column either sixteen or twenty-one characters.

The printed matter found in the Tun-huang caves and described in the preceding chapter comes in the main from just the time that Fêng Tao was printing the Classics. Of the nine [16] dated specimens at London and Paris, six [16] contain dates ranging from 947 to 950, and almost all the Tun-huang prints date from Fêng Tao's century. But this is not Fêng Tao's work. The work of the National Academy was Confucian—orthodox—the Tun-huang finds are Buddhist. What the Tun-huang finds reveal is that, side by side with the official Confucian printing of Fêng Tao, which so many literary men described, Buddhist printing continued to pursue its quiet course, ready to culminate in that great undertaking, the printing of the Tripitaka, which ushered in the Sung era, and which will be described in the next chapter.

During Fêng Tao's administration Buddhist printing spread to Korea. The first recorded printing in Korea was a popular apocryphal sutra that was written originally in Chinese, and not, like the true sutras, translated from Sanskrit. This bears the date 950.[17]

The work of Fêng Tao and his associates for printing in China may be compared to the work of Gutenberg in Europe. There had been printing before Gutenberg—block printing certainly and very likely experimentation in typography also—but Gutenberg's Bible heralded a new day in the civilization of Europe. In the same way there had been printing before Fêng Tao, but it

was an obscure art that had little effect on the culture of the country. Fêng Tao's Classics made printing a power that ushered in the Renaissance of the Sung era. It is too much, however, to call Fêng Tao the inventor. Not only had printing existed before his day—and printing which differed very little in technique from that which took place under his administration—but also Fêng Tao had no part, so far as we know, in the technical work. He was the prime minister who saw the value of the new invention and gave the order to print on a large scale. His name has gone down in history as one of China's great inventors, but his glory should be shared with others who did more than he to inaugurate the new invention.

A PRINTED BOOK OF THE SUNG DYNASTY

From the Dynastic Histories,—History of the Dynasty of Southern Ch'i. Printed books of the Sung Dynasty (960–1280) can be found in many private libraries of China and Japan and in the leading national libraries of Europe. They are as a rule the most perfect specimens of the block printer's art and have never been surpassed in technique. They are usually paged and stitched like modern Chinese books

(Size of double page 40 x 28 cm.)

CHAPTER X

THE HIGH TIDE OF CHINESE BLOCK PRINTING

THE SUNG AND MONGOL DYNASTIES (960–1368)

ONE of the many generals, who had been contending for authority during the anarchic period of the Five Dynasties, succeeded in the year 960 in placing himself on the throne and uniting the empire under his sway. This was the beginning of the Sung Dynasty, a period which rivalled that of the T'angs in cultural achievement. The T'ang Dynasty 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—great compendiums of history, 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 that 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 that are now extant come from the period of the Sungs.

In invention, what the T'ang period conceived, the Sung era put to practical use. The magnetic needle, used in the main in earlier times either as a toy or for the location of graves, was applied to navigation.[1] Gunpowder, already known and used for fireworks, was during the Sung Dynasty applied to war.[2] Porcelain was so developed as to become an article of export to Syria and Egypt.

A similar development took place in printing. From an obscure Buddhist art at the end of the T'ang Dynasty, it was already mak-

ing rapid strides forward during the half century interregnum. But as Fêng Tao's Classics were published only seven years before the first Sung emperor ascended to the throne, it was not until that dynasty had become established that his work bore fruit. The printing of the Classics was one of the forces that restored Confucian literature and teaching to the place in national and popular regard that it had held before the advent of Buddhism, and a classical renaissance followed that can only be compared to the Renaissance that came in Europe after the re-discovery of its classical literature and that there too was aided by the invention of printing. This is the reason why Fêng Tao's work has been considered of such importance by Chinese historians. Another result of the publication of the Classics was an era of large scale printing, both public and private, that characterized the whole of the Sung Dynasty.

In quality the block printing of the Sung epoch has never been surpassed. The fine workmanship of these artist-craftsmen—beautiful calligraphy perfectly reproduced in print—sets a standard for all time. The importance of calligraphy to the book-lovers of the day is shown by the fact that in almost all Sung editions the name of the calligrapher who prepared the copy is recorded in the colophon along with those of the author and the printer. This also was a time of improvements in the technique of printing of which the most noteworthy was the invention of movable type. But that new development must be reserved for discussion in a later chapter.[3]

The advent of the Sung Dynasty caused little change in the printing administration that had been organized by Fêng Tao. The National Academy was still in charge of the work. The first books published by the government were further commentaries on the Classics, literary compendiums and classical dictionaries.[4] In the order for the printing of one of these earliest works, it is expressly stated that the arrangements as to paper, ink and expense should be the same as in the case of the Nine Classics. The printing of this work was in charge of a man from Szechuen.[5] The

next important work was a voluminous commentary on the Classics in a hundred and eighty volumes,[6] containing at the end a page of "errata," in which ninety-four misprints were corrected.

The conquest of Szechuen (Shu) in 965 brought the printing of that province and of the central empire together. Wu Chao-i, who had been for years the patron of printing in Shu, and who had had more than any other the vision to see the possibilities of the new art in making literature available to the common people, was found by the conquerors, an old man, living in retirement and obscurity. He was brought with great honor to the imperial capital, his printing blocks were searched out and again used under his direction, and from that day the printing that had circulated in Shu became current throughout the empire.[7]

By the end of the tenth century the printing of the great dynastic histories had started. This was a monumental work in many hundred volumes and occupied nearly seventy years. Like the printing of the Classics it was entrusted to the National Academy.[8]

From 1063 little is heard of the National Academy till after the conquest of North China by the Kin Tartars and the removal of the capital to Hangchow. This was a time of constant warfare and frequent invasion. In 1139, a dozen years after the setting up of the capital at Hangchow, a new edition of the Nine Classics from the old plates was ordered by the emperor. As some of the plates were lost, the work was still unfinished in 1157. An order was then issued for the preparation of new plates where needed, and the edition was soon complete. From one authority it seems that a part at least of the dynastic histories was printed at the same time.[9]

Meanwhile it is clear that private printing was gaining ground and spreading through the empire. Although the only records of this private printing are the title pages of the books that have been preserved, yet from these a certain amount of incidental and disconnected information can be gleaned, as for instance the fact that the poet Ch'en Ch'i[10] was also a publisher. Two hereditary

publishing houses figure century after century in these title pages, the I[11] family at Hangchow and the Yü[12] family in Chien-an.[13] This latter place was located in Fukien, very near the birthplace of the philosopher Chu Hsi. Here printers by the name of Yü were publishing books before the advent of the Sungs, and continued down into Ming times, over four hundred years. The names of the family through generation after generation have been preserved in old Sung editions, which are, by the way, the finest editions of the Classics that are now in our libraries. Between 1265 and 1275, just a few years after the conquest of southern China by Kublai, an edict was issued closing this printing establishment, and this edict has been preserved in the annals of the Mongol dynasty. The edict could not have remained long in force, however, for books with the mark of the Chien-an printing house continued to appear for still another century.[14]

The question naturally arises what kind of books were printed in these private establishments. Classics, commentaries, and histories seem to have been the favorite subjects, just as they were in the government printing office. The feeling of sacredness that in China has always surrounded and still surrounds the written or printed page—the feeling that impels men to-day as a pious act to gather and burn printed scraps of paper and thus save them from being defiled—prevented the printing of any books that were not considered to be of great worth and dignity. There is evidence, however, that the practice began early in the Sung Dynasty of printing the winning essays in the great national examinations.[15] Local histories—histories of provinces and of cities—were also printed, probably in great number, judging from the number of those still extant.[16] Later in the dynasty the field of printed literature grew constantly wider, including works on botany and agriculture and collections of poetry.

While Sung editions are rare and consequently valuable, there are a few in the possession of each of the great central libraries of Europe as well as in the Far East. A monumental work in 2100 volumes was recently published in China consisting of photo-

ONE OF THE EARLIEST PRINTED BOOKS OF JAPAN

A part of the Diamond Sutra, as translated from Sanskrit to Chinese by Hsüan Tsang. Printed in Japan in 1157 in folded book form, the form usually used for Buddhist scriptures, both in China and Japan

British Museum.

A BUDDHIST WOODCUT OF THE SUNG DYNASTY

(27 x 44 cm.)

Museum für Völkerkunde.

graphic reproductions of rare old books from Chinese private libraries. A study of the three hundred and more volumes in this collection that are photographed from originals of the Sung and Mongol dynasties gives a good cross-section view of the kinds of literature that were popular with Chinese publishers during the time that William the Conqueror was invading England and the barons were wresting Magna Charta from the unwilling King John, and while the Crusading princes were fighting with Saladin for the possession of the Holy Sepulchre. Histories are in the lead. Next come the collected works of various noted essayists, commentators, poets and philosophers—large collections, running to many volumes each. A number of contemporary works on agriculture also appear.[17]

As for the commercial side of this early publishing, a certain amount of light is thrown on the subject by an extract from an old account book, dated 1176:

For book of 1300 pages, including 30 pages of extra heavy paper at the beginning and the same at the end:

Paid to printer for paper, paste and labor. Per copy	1500 cash.
Rent of plates	1200 cash.
Selling price of books. Per copy	8000 cash.[18]

The Sung empire in spite of its high culture could not successfully compete in warfare with the steadily encroaching nomads of the north. First the Khitans or Liao swept over Manchuria and the northern edge of the empire and held their domain for more than a century. Then the Kins, ancestors of the Manchus, overthrew the Liao and advanced still further, occupying for a whole century all that part of China which lies north of the Yangtze, and forcing the Chinese dynasty of the South, now known as Southern Sung, to move its capital to Hangchow. Finally in 1235 the empire of the Kins, and half a century later the Sung domain itself, went down before the world-conquering Mongols. But "China is a sea that salts every river flowing into it." Each

nomad people during its century or more of rule became thoroughly Chinese in culture and in ways of living—so much so that, first the Liao against the Kins, and later the Kins against the Mongols, stood as bulwarks of Chinese civilization attempting to hold back the new inundations of barbarians from the desert.

As for the printing of that part of North China that came under the Liao domain, very little is known. A statement in the Liao annals to the effect that in 1056 "a college was founded and all the Classics and their commentaries spread abroad," makes it probable that there was a Liao edition of the Confucian Classics, but this is about the extent of our knowledge.[19]

The Kin dynastic records tell of the opening of a government office for the printing of the Classics in 1130, only five years after their conquest of North China. P'ing-yang,[20] where this office was located, was a famous center of book production up to the end of the dynasty. Little more is known of official printing under the Kins, either in their own language [21] or in Chinese, but a number of Chinese books that are still extant bear dates reckoned from the Kin era, showing that the ordinary life of the people, including printing, went on under the northern conquerors without much disturbance.

The coming of the Mongols, who finished the conquest of North China in 1235 and of South China in 1280, wrought little change within China. The policy of the conquerors was to accept the customs of the land as they found them. The printing of China under the Mongols was thus similar to that of the preceding dynasty, but the broadening of the scope of printed literature, already noticeable, became even more marked. Among the new lines of printed literature recorded are a medical book,[22] a large quantity of almanacs [23] and even a play.[24] This last is of importance because the novel and the drama first became prominent in Chinese literature in Mongol times. These may perhaps be a reflection of Persian influence, and show the cultural connection between the East and West that followed in the wake of political

union. The novel and the drama were both considered as very popular, almost vulgar, literature—if the word literature could be applied to them at all. The printing of a play marks a long step toward the popularization of printing. Another bit of popular printing that has been preserved is a woodcut entitled, "Beauties who from dynasty to dynasty have overturned empires." [25]

From many sources we learn that quantity production became far greater during Mongol times than in the earlier period and that it became still greater during the century after the Mongols were overthrown—the century before Gutenberg. It was apparently during the early years of the fifteenth century, just about the time of Gutenberg's birth and of the large scale use of metal type in Korea, that Chinese block printing reached its highest point, so far as the annual number of books produced is concerned.[26] But Chinese connoisseurs find in the printing of this time a corresponding deterioration in quality and technique.

There are many references to official printing in the annals of the Mongols and of the early Ming emperors. When Kublai captured Hangchow, the southern capital, he carried away with him to Cambaluc (Peking) all the blocks that had been used by the official printing office, as well as a large number of blocks from the province of Kiangsi.[27] A government printing office having already in 1236 [28] been opened in Cambaluc, the addition of all this material gave great impetus to its work. In 1293 this office was united with the Hanlin College and charged with printing certain books in the Mongol tongue as well as in Chinese.[29] In 1330 a special office was opened for the translating and printing of Confucian literature in Mongol, and another office for printing the "sacred teachings of the imperial ancestors." [30]

Though many Chinese books of Mongol times are still extant, resembling in every way the books of the Sung era, very little in the Mongol tongue has been preserved. The Mongols were a totally unlettered people when they began their conquests. It was only after Jinghis' career was well under way that he employed some Uigur scholars to reduce his language to writing. The

Mongols, not being themselves a literary people, were content to patronize Chinese literature in the East and Arabic literature in the West. Inasmuch as the translation of books into Mongol was a matter of national pride rather than of utility, editions were small, and little of Mongol printing has survived. One survival that is of special interest is a Mongol poem, found by M. Pelliot at Tun-huang. This is apparently an original Mongol work and not translated from the Chinese. The four fragments of Mongol sutras found in Turkestan and the Buddhist prints and paper money found in Mongolia itself will be described in the chapters on Turfan and on the Mongol Empire.[21]

So far our description of the printing of the Sung era has taken account only of Confucian printing, the printing of the Classics and of those historical and literary works that followed in the wake of Fêng Tao's great publication. In this we have followed the Chinese records. The Chinese historians of the Sung Dynasty are curiously silent concerning the strictly religious printing of the Buddhists and the Taoists, and in this the early historians are followed by such modern compendiums as that of Liu An. The Buddhist tradition and the Confucian-secular tradition were apparently separate streams, whose waters seldom mingled. Yet it was Buddhist printing that spread to Japan; it was Buddhist printing that spread to Central Asia; and in China itself it was Buddhists who printed the greatest single work of which we have record.

During the reign of the first Sung emperor (probably in the year 972) there was published in China one of the most monumental works that history records. This was the whole Buddhist canon, usually called the Tripitaka, which contained both the sacred scriptures that had been translated from the Sanskrit and a smaller number that had been written independently in Chinese. This collection consisted of 1521 separate works, in more

than five thousand volumes, and covering 130,000 pages. It therefore required the cutting of 130,000 blocks.[32] This massive work was reprinted (probably from the same blocks) twenty times during the Sung and Mongol dynasties. The fact that the printing of the Tripitaka is ignored by historians, who describe in such detail the work of Fêng Tao, speaks eloquently of the regard—or lack of regard—in which Buddhism was held by the ruling and literary classes during the Confucian Revival.

It was in Korea and Japan that the printing of the Tripitaka had its great effect. In 995 the king of Korea asked for and obtained a copy from the emperor of China. He then gave orders that it be revised and reprinted in his own dominions. The work occupied fourteen years. A copy of the Tripitaka now in Tokyo,[33] of which only two of the 6,467 volumes are lacking, was printed in Korea in 1457 and brought to Japan a few years later, and claims to be a reprint made at that time by order of the king from the original tenth century wooden blocks that had been carefully preserved in the Hai-in monastery.

Meanwhile in 987 a printed copy of the Tripitaka was brought from China to Japan by a priest named Chio-nen.[34] In describing this event there is used for the first time in Japanese literature the word *suri-hon*, printed book. For two hundred years—since the famous million charms of 770—Japanese records had been silent on the subject of printing. Either the art died out and had to be re-introduced from the mainland, or else it was too obscure to find a place in the annals.

After the bringing of the Buddhist canon from China in 987, very nearly two centuries more elapsed before the first mention of any book being actually printed in Japan. In 1157 the Diamond Sutra was printed—the favorite book with printers of China, Japan and Central Asia—and a portion of this edition is now on exhibition in the British Museum. There are other sutras extant dating from

1206 and 1223, and from that time on an ever increasing number.[35] Apparently between 1278 and 1288 the great Tripitaka was printed in Japan, as it had been printed in China and Korea three centuries before.

The books printed in Japan during the time corresponding to the Sung and Mongol periods—in striking contrast to those of China—are all Buddhist. They are as a rule works of merit, printed in payment of a vow to succor a parent, relative or friend in the next world—or else to obtain special merit for the one who bears the expense of the printing. They contain inscriptions of which the following is typical: "Moronafu on mature reflection sees that the faults of the present life are more than can be numbered, and to expiate the sins of boundless ages of past time is an impossibility. He has therefore undertaken the printing of this true doctrine, in order thereby to eradicate his accumulated guilt." [36]

With the inauguration of the Ashikaga régime in Japan (1336), and the expulsion of the Mongols from China (1368), there began the second great influx of Chinese culture into the island empire. For four hundred years, during all the cultural triumphs of the Sung period, China and Japan had scarcely met. Now all the stored-up energy of four centuries began to enter Japan like a flood, with the result that Japan was able to carry forward the great tradition of Sung culture during the long period of stagnation that set in on the continent during the Ming Dynasty. This epoch is marked by the first printing of Chinese Classics in Japan. The earliest Confucian work found by Satow in his researches, a copy of the Analects, is dated 1364. Ten more such books bear dates between that and 1400. Up to this time Japan had printed nothing but Chinese translations from the Sanskrit. Now for two centuries she printed original Chinese works. It was not till the end of the sixteenth century, so far as known, that the first original Japanese work appeared in print—a copy of the *Nihongi* (Historical Records), printed with movable type.

Buddhist printing spread not only east but west. The great quantity of Buddhist fragments of this period found by the German expeditions in the region of Turfan, the Uigur center, is described in a separate chapter.[37] A smaller number of printed sutras of a similar character and in the same languages was found by M. Pelliot at Tun-huang, not in the sealed manuscript chamber that contained the Diamond Sutra, but in one of the other caves.[38]

A third source of Buddhist printing for this period is found in the discoveries of the Russian expedition of M. Koslov in Mongolia.[39] The excavation of the buried city of Kara-khoto brought to light a considerable number of printed books, evidently Buddhist, in the language of the Tanguts, a people of Tibetan origin, who occupied northwestern China and a part of Mongolia during the two centuries preceding the conquests of Jinghis Khan. These Tangut texts have not yet been deciphered. With them however were found a dozen or more printed books in Chinese which are of special interest because, unlike the books of Turfan, they almost all contain dates.

The oldest of the Kara-khoto books is dated May 16, 1016. Of printed books that bear a clear date, it is therefore the second in age which has so far been brought to light.[40] Like the Diamond Sutra of Tun-huang, this is in roll form, the sheets being pasted together end to end. And this is an abridged edition of that same Diamond Sutra that was found at Tun-huang, though in a different translation.[41] Each sheet shows in the margin the name of the individual by whom the block was engraved, while a final note gives the name of the patron who supplied the funds. As the patron and at least two of the engravers have been identified as men whose names appear in local histories in the province of Shensi,[42] this is evidently a book brought from that province, and a sample of the Buddhist printing that was going on in China proper near the old capital.

In contrast to that part of China which was under the dominion of the Sung emperors, and where all Buddhist printing was of more or less humble origin, a number of the Kara-khoto sutras

contain the statement that they were printed by order of the Tangut empress and at her expense. Among these is another Diamond Sutra, printed in 1189.

Additional light on the Buddhist printing of the Tangut empire is shed by a note in the official records of the Yüan Dynasty. On November 29, 1294, it is stated, "orders were given to the *Hsüan-cheng-yüan* to stop cutting the blocks for the Tripitaka in Ho-si (Tangut)." [43] There must have been everywhere in eastern Asia a passion for printing this great work with its five thousand odd volumes. It had already been printed in China, in Korea and in Japan. How much had been printed in Tangut before this order of 1294 put a stop to the work, we have no means of knowing.

The special significance of the Kara-khoto printing, like that of the Uigurs of Turfan, lies in the fact that this was on the direct route to the West, and that these printed books, spanning the period from 1016 to 1352, were found not far from the original center of the empire of Jinghis Khan in one of the first regions that he added to his growing domain.

Taoist books from the Sung Dynasty are rare, and the progress of Taoist printing is more or less obscure. It has already been shown (chapter two) that the part played by the Taoists in the origin of printing, though obviously of great importance, is more difficult to trace than the Buddhist and Confucian contributions. Taoist activity in T'ang times is also suggested in Liu Pin's statement (chapter seven) and in the beginnings of playing cards.[44]

As for the Taoist philosophers, during the T'ang Dynasty the works of Laotzŭ and Chuang-tzŭ had been given a place in the Confucian canon on account of the Taoist affiliations of the dynasty. Though this position had been lost before Fêng Tao published the Classics, yet in one of the commentaries that he published—a commentary written in T'ang times—the works of Lao-tzŭ and Chuang-tzŭ were included among the Classics.[45] This

is, so far as known, the first printing of Taoist classical literature—commentaries printed not by Taoists but as a part of the Confucian canon.

The publication of the Confucian Classics in 953 and of the Buddhist Tripitaka in 972 evidently spurred the Taoists on to competition. The compiling of the full Taoist canon was completed in 1016, and it was printed either at that time or somewhat later. Nothing from this first edition survives, but several reprints, made before the end of the dynasty, are still extant. Two such Taoist books are among Koslov's finds at Kara-khoto,[46] and one, a Sung edition of the *Tao-tê-ching*, appears in the collection of photographic reproductions recently added to the Library of Congress.

Curiously enough, two books of the Manichean scriptures, adopted and taken over by the Taoists as their own, were printed along with the other Taoist books, either at this time or in one of the later editions of the Taoist canon. That these sacred writings of a religion that made its way across northern Africa during the latter days of the Roman empire, and that has been known to us almost wholly from the works of St. Augustine, should have found their way in the course of centuries into China, there to appear in print some two or three hundred years before the art of printing reached Europe, is one of the anomalies of history.

One reason why few Taoist books have survived is the determined attempt made by the Buddhists, often with imperial backing, to destroy them. In 1258 the Great Khan Mangu deputed his brother Kublai to represent him at a debate which was held in Kublai's presence between Buddhist and Taoist representatives with regard to the authenticity of the tradition concerning Lao-tzŭ's activities in Central Asia. The Taoists were defeated, and the result was an imperial order to the head of the Taoist religion that he should bring all Taoist books to the capital and burn them, and that all the blocks for printing such books should be burned at the same time.[47]

Mohammedans have never in any part of the world been

fond of printing. Though Moslems entered China in great numbers during the Mongol period and of course brought the Koran with them, there is no record that the Koran or any part of it was ever printed in China. There is, however, one record of printing for Mohammedans. In the year 1328 there was a great issue of printed almanacs, 3,123,185 of them, in three different sizes, with special details about lucky and unlucky days for marrying, starting on a journey, making a garment or buying goods. It is recorded that these almanacs were of two kinds, and that one kind was prepared specially for the use of Mohammedans.[48]

Of all the religions that flourished in China under the Mongols, there is just one that, so far as our records go, never printed. This is Christianity. Neither the Nestorians, whose churches Marco Polo found at Chinkiang and Hangchow and in Central Asia, nor the Roman Catholics, whose work flourished in Peking and Fukien soon after Marco's departure, seem to have availed themselves of the new invention—at least no Christian printing is recorded. However it must be remembered that even Buddhist printing is almost never recorded except in Buddhist books. It is only the finding of these books that has revealed the great part which Buddhist printing played. The discovery at some time in the future of a printed New Testament from this period is not an impossibility and may throw light on the problem of how printing was transmitted.

This story of the development and spread of block printing in the Far East during the time of its greatest advance—during the four centuries before the art first made its appearance in Europe—may well close with a summary written by Yeh Mêng-tê about the year 1130.[49] It is to be noted that the author wrote before quantity production really began, before most of the Sung books now in our libraries were printed, and before the speeding up that took place in Mongol and early Ming times.

"Before the T'ang dynasty," writes Yeh Mêng-tê, "all books were manuscripts, the art of printing not being in existence. People regarded the collecting of books as something honorable, and

no one had them in large quantity. Those who collected them had great ability in collating and comparing, whence it frequently happened that people had fine copies, and students, as a consequence of the great labor of transcription, also acquired great ability and closeness in reciting them. In the time of the Five Dynasties, Fêng Tao first memorialized his sovereign praying that an official printing establishment might be put in operation. And again in those years of our reigning dynasty called *Shun-hua* (990–994) officers were commissioned to print the historical records and the annals of the first and second Han Dynasties. From that time forth printed books became still more numerous; scholars and officers ceased to make the collection of books a chief object of attention; and, as students found it easy to obtain books, the practice of reciting was in consequence broken up." It is idle to speculate why in the stagnation of later centuries China lost the progressive educational impulse the existence of which this conservative writer so laments. Suffice it to say that every record of the Sung Dynasty that we possess enables us to see a country which in its progressive thinking shows the result of this new stimulus and reminds the reader strangely of the re-awakened Europe of the century that followed Gutenberg.

CHAPTER XI

THE PRINTING OF PAPER MONEY

THE form of early printing that was most widespread in China—the printing that touched all classes of the people, and also attracted the attention of Marco Polo and other European travellers—was paper money.

Chinese writers in treating of paper money consider it to have been a natural development from other forms of representative currency. In B.C. 119, pieces of white deer skin a foot square were used at the court of the emperor Wu Ti with a certain monetary value.[1] Again, a little more than a century later, the emperor Wang Mang issued a series of coins differing but slightly in size and shape, but differing greatly in value, and ordained by decree that they should circulate for values far in excess of the actual worth of the metal contained.

As for money actually made of paper, most writers date its beginning in the reign of the emperor Hsien Tsung of the T'ang Dynasty. About the year 807 it is recorded that the supply of copper became scarce, apparently on account of the large number of images of Buddha being cast, and it was forbidden to use copper for the making of tools and other utensils. At the same time merchants who came to the capital were expected to deposit their cash with the government, and to receive in exchange certificates of indebtedness, which were apparently negotiable and hence received the name "flying money." This relieved the temporary money stringency, but for some reason the practice was soon discontinued.[2] Two years later "flying money" was again resorted to and paid to merchants in exchange for iron and salt, but the practice was continued only a short time.[3]

While it is usually supposed that this "flying money" of 807 and 809 was printed, there is nothing in the Chinese text to indi-

cate the fact. From the text it seems more probable that the "flying money" consisted simply of written receipts sealed with the imperial seal and identifiable by fitting the torn edge with the torn edge of a stub kept at the imperial treasury.[4] It is needless to add that the claims of various collectors to possess paper money of this issue are without adequate foundation.[5]

A century and a half passed after the two issues of "flying money" before anything resembling paper money is heard of again. The next notice is from the state of Shu or Szechuen, and comes from the very time when Fêng Tao and the rulers of Shu were rivalling each other in printing the first edition of the Classics. At this time, according to Ma Tuan-lin, "The people of the state of Shu had made paper money without the knowledge of the government, because their iron money was so heavy. They had called this paper money *chiao-tzŭ*[6] or bills of exchange. Because these bills of exchange were convenient in trade, sixteen wealthy families had united together to manage their issue. But when the wealth of these families gradually diminished, and they were no longer able to redeem their pledges, many quarrels and lawsuits ensued. Certain persons advised the prohibition and cancellation of the bills. As this however would paralyze trade, it was suggested to establish an office for the issue of paper money on the part of the government and to prohibit the people from making it privately. According to this proposal, a decree was enacted to establish a bank for the issue of bills of exchange at I-chou."[7]

This first issue of paper money in Shu cannot be accurately dated, but, as it is evident that the issue of notes by the state government took place some time before the year 970, it seems reasonable to suppose that that work was going on at just about the same time (935–954) that the first public printing of books was being carried on in Shu, and that the private issue by sixteen wealthy families began some years or decades earlier. It is interesting to note that I-chou in Shu is the very city about which the first references to printing in Chinese literature center, references

that carry the private printing of books as far back as the end of the ninth century. There can be little doubt that the paper money of I-chou, and subsequent issues, both in Shu and in the imperial capital, were printed.[8]

While the first issue of printed paper money, like the first official printing of books, probably took place in Szechuen or Shu, the imperial government was not long in seeing the advantages of the new medium of exchange. In the year 970, under the first emperor of the Sung Dynasty, there was established at Ch'ang-an (Si-an-fu), the capital, a government office for the issue of "convenient money" as it was called. For four centuries this office did a flourishing business, until gradually paper largely displaced other forms of money and became the chief currency of the empire.

By 998 the amount of paper money in circulation had reached a total of 1,700,000 *tiao*. (A *tiao* is a string of a thousand cash, equivalent now to about thirty cents, U. S. currency, but having at that time far higher purchasing power.) In 1022 there was an additional issue of 1,130,000 *tiao*. During the next ten years the dangers of over-issue of paper money became apparent and some time about 1032 a decree was issued limiting the total circulation to 1,256,340 *tiao*. This law apparently had the desired effect, and for more than half a century was strictly adhered to.[9] In 1068 counterfeit bills appeared, and a decree was promulgated providing that this offence should be punished by the same penalties as forgery of the seals of state.

The decade from 1068 to 1078 witnessed an attempt at thorough-going renovation of China's fiscal system under the administration of the radical reformer Wang An-shih, commonly known as China's socialist premier. In spite of intense opposition from the conservatives, the whole incidence of taxation was changed and placed on a more democratic basis. Certain of the decrees of Wang An-shih indicate that it was no easy task to keep the paper currency at par and that various expedients had to be resorted to. But they were apparently successful, for it was nearly twenty

NOTE FOR ONE THOUSAND CASH ISSUED BETWEEN 1368 AND 1399

There is reason to believe that the paper money described by Marco Polo less then a century earlier than this did not differ greatly from the note here shown. Notice specially the red seal impressions. By the time this note was issued, seal impressions and printing, once identical had become as clearly distinguished as our postmark and postage stamp are to-day
(34 x 22.5 cm.)

New York Museum of Numismatics.

years after Wang's retirement and after his laws had been rescinded, that serious depreciation began.

Rapid inflation started some time between 1094 and 1107. At the latter date it is recorded that twenty times as much money was in circulation as in 1023, and in the same year a new issue was put forth with the regulation that each thousand cash of the new should be equal to four thousand cash of the old. A few years later the statement is made that a thousand cash note had only the purchasing power of ten cash.

The history of the twelfth century is the story of a constant struggle between the Chinese and the Nü-chen Tartars, whose rulers after their conquest of North China called themselves the Kin Dynasty. It is also the story of a constantly losing warfare with high prices and falling currency. There were times when the printers of Hangchow must have been almost as busy as those of Berlin in 1923. Again there were times when inflation seemed to be checked for a while, only to break loose again with a mad issue of notes that quickly became worthless.

In the year 1127 the emperor Hui Tsung was taken captive by the Tartars, and all northern China ceded to the Tartar power. From this time the Chinese Dynasty, that ruled only South China, was known as Southern Sung, and the period was one of general demoralization, in which continued and increasing currency inflation played no small part. The constant wars between the Chinese and the Kins usually ended in Chinese defeat and large war indemnities, payable partly in gold and silver, partly in silk and other articles of merchandize. To meet this drain on her resources, China had recourse to inflation on a hitherto unprecedented scale. From 1161 to 1165, twenty-eight million taels' worth of notes were issued, in denominations ranging from two hundred to a thousand cash. In 1166 between fifteen and sixteen million taels were added. (A tael was then considered equal to a thousand cash). From this time the amount increased steadily year by year. In 1209, the year after the most humiliating treaty with the Kins, when the annual tribute had been increased, and a

special additional war indemnity of three million taels imposed, the pitiful experiment was tried of issuing a new kind of note, promising to pay in gold or silver, instead of copper as in previous issues. To show that this issue was something new, and to make it popular, it was printed on perfumed paper, made partly of silk.

But it was all in vain. The new money was no better than the old. Ma Tuan-lin, China's great historian, who himself witnessed the fall of the Sung Dynasty and the financial condition that hastened that fall, describes the final paroxysm of inflation in words that have a strangely familiar sound to modern ears:

"After having for years tried to support and maintain these notes, the people had no longer any confidence in them, and were positively afraid of them. For the payment for government purchases was made in paper. The fund of the salt manufactories consisted of paper. The salaries of all the officials were paid in paper. The soldiers received their pay in paper. Of the provinces and districts, already in arrear, there was not one that did not discharge its debts in paper. Copper money, which was seldom seen, was considered a treasure. The capital collected together in former days was . . . a thing not even spoken of any more. So it was natural that the price of commodities rose, while the value of the paper money fell more and more. This caused the people, already disheartened, to lose all energy. The soldiers were continually anxious lest they should not get enough to eat, and the inferior officials in all parts of the empire raised complaints that they had not even enough to procure the common necessities. All this was the result of the depreciation of the paper money." [10]

Meanwhile, a century before the Southern Sung Dynasty had come to an end, the Tartar conquerors of northern China had followed the example of their southern neighbors and begun to issue paper money. The Kins who ruled in the North collected their tribute and indemnities from the Chinese in metal money or bullion, which the government stored up, issuing in its place a paper currency, which, in the beginning at least, fared better than the notes of the defeated Chinese. The first recorded issue by

this northern government was some time between 1156 and 1161, and from that time the use of paper money in the North became as general as in the South.

The first recorded issue of paper money in the Mongol Empire took place in the year 1236, two years after Ogatai, Jinghis' son, had overthrown the last Kin emperor and made himself master of North China. This was a small issue of fifteen thousand taels.[11] From 1260, when Kublai Khan completed the conquest of China and took the title of emperor, the issue of paper money became a settled and permanent feature of the Mongol government's financial policy. In the first year of his reign Kublai issued smaller notes ranging from ten cash to two thousand cash in value, and larger notes representing a thousand taels (ounces) of silk, which were considered to be the equivalent of fifty taels of silver. In 1264 a treasury for the issuance of paper money was established in each province. Records have been preserved showing year by year the amount of notes issued through Kublai's reign and that of his successors for sixty-four years (1260–1324). During this period a total face value of over two billion taels (2,380,563,800) was printed, an average of more than thirty-seven million per year.[12]

What this represented in real value it is hard to say. There was of course depreciation, but in a successful empire, receiving tribute instead of paying indemnities, depreciation was not rapid. Marco Polo distinctly states that in his time the notes passed for full face value and Pegalloti half a century later says the same. Other authorities disagree. According to one Chinese source there was a depreciation of sixty per cent. between 1287 and 1309. According to others the depreciation was still greater. But it is everywhere indicated that the Mongol money held its own remarkably, as compared with that of the previous century, and that an annual issue of thirty-seven million taels, at a time when the total budget of the wealthiest sovereign in Europe could hardly have exceeded one million taels,[13] makes Marco Polo's statement that "the Great Kaan hath more treasure than all the kings of the world" not a great exaggeration.

The subsequent fortunes of Chinese paper money may be briefly stated. In the last half century of the Mongol Dynasty, the period of decline, more paper money was issued than ever, and depreciation was rapid. Under the able administration of the first Ming emperor, Hung Wu (1368–1399), the amount of paper currency issued was decreased, and it was put on a firm and stable basis; under Yung Lo (1403–1425) the issue of paper money ceased and was never resumed till the year 1851.

In this resumé certain facts stand out that are of interest in the history of printing:

First as to date. China had been issuing paper money for more than a century when Christendom saw its first paper. China had been on a paper money basis for four hundred years when block printing began in Europe. The last issue of Chinese paper money took place during Gutenberg's childhood.

Second as to amount. The average annual issue of paper money during the early years of the Mongol Dynasty—before heavy depreciation began—was over thirty-seven million taels. It is evident that in the various issues small denominations prevailed, sometimes as low as two cash. Hence there must have been more than thirty-seven million separate notes printed each year. In other words, printing was being done on a very large scale, and specimens of printing were in the hands of everyone who bought or sold.

Third as to geographical distribution. Marco Polo's statement is, "He makes them [paper notes] to pass current universally over all his kingdoms and provinces and territories and whithersoever his power and sovereignty extends." On the other hand, while Marco Polo has a regular formula with which he introduces his descriptions of Chinese cities, "The people are idolators and subjects of the Great Kaan, and have paper money," this formula is not used of places outside of China. De Rubruquis' statement and certain Russian sources indicate that another form of representative currency, made of sable fur, was used in Russia. An important issue of printed paper money took place in Persia in the year 1294,

but the language used to describe it indicates that it was something unusual.[14] Marco Polo's apparently conflicting statements may be reconciled, if we consider that paper money was the ordinary medium of exchange only in China and in the territory immediately adjoining China, but that in other parts of the empire it was known and used by merchants having dealings with China. Outside the Mongol Empire there was an issue of paper currency in Japan between 1319 and 1327.[15]

Paper money was the first form of Chinese printing met with by European travellers, was independently described by at least eight pre-Renaissance European writers,[16] and is, so far as known, the only form of Chinese printing described in European writings of pre-Gutenberg days. Marco Polo's description is the most detailed, and also of interest because of the great publicity that his writings gained in Europe.

"The Emperor's Mint," Marco Polo writes, "is in this same City of Cambaluc, and the way it is wrought is such that you might say he hath the Secret of Alchemy in perfection, and you would be right! For he makes his money after this fashion.

"He makes them take of the bark of a certain tree, in fact of the Mulberry Tree, the leaves of which are the food of the silkworms—these trees being so numerous that whole districts are full of them. What they take is a certain fine white bast or skin which lies between the wood of the tree and the thick outer bark, and this they make into something resembling sheets of paper, but black. When these sheets have been prepared they are cut up into pieces of different sizes. The smallest of these sizes is worth a half tornesel; the next, a little larger, one tornesel; one, a little larger still, is worth half a silver groat of Venice; another a whole groat; others yet two groats, five groats, and ten groats. There is also a kind worth one Bezant of gold, and others of three Bezants, and so up to ten. All these pieces of paper are issued with as much solemnity and authority as if they were of pure gold or silver; and on every piece a variety of officials, whose duty it is, have to write their names, and to put their seals. And when all is prepared

duly, the chief officer deputed by the Kaan smears the Seal entrusted to him with vermilion, and impresses it on the paper so that the form of the Seal remains printed upon it in red; the Money is then authentic. Any one forging it would be punished with death. And the Kaan causes every year to be made such a vast quantity of this money, which costs him nothing, that it must equal in amount all the treasure in the world.

"With these pieces of paper, made as I have described, he causes all payments on his own account to be made; and he makes them to pass current universally over all his kingdoms and provinces and territories, and whithersoever his power and sovereignty extends. And nobody, however important he may think himself, dares to refuse them on pain of death. And indeed everybody takes them readily, for wheresoever a person may go throughout the Great Kaan's dominions he shall find these pieces of paper current, and shall be able to transact all sales and purchases of goods by means of them just as well as if they were coins of pure gold. And all the while they are so light that ten bezants' worth does not weigh one golden bezant.

"Furthermore all merchants arriving from India or other countries, and bringing with them gold or silver or gems and pearls, are prohibited from selling to any one but the Emperor. He has twelve experts chosen for this business, men of shrewdness and experience in such affairs; these appraise the articles, and the Emperor then pays a liberal price for them in those pieces of paper. The merchants accept his price readily, for in the first place they would not get so good an one from anybody else, and secondly they are paid without any delay. And with this paper-money they can buy what they like anywhere over the Empire whilst it is also vastly lighter to carry about on their journeys. And it is a truth that the merchants will several times in the year bring wares to the amount of 400,000 bezants, and the Grand Sire pays for all in that paper. So he buys such a quantity of those precious things every year that his treasure is endless, whilst all the time the money he pays away costs him nothing at

all. Moreover, several times in the year proclamation is made through the city that any one who may have gold or silver or gems or pearls, by taking them to the Mint shall get a handsome price for them. And the owners are glad to do this, because they would find no other purchaser give so large a price. Thus the quantity they bring in is marvellous, though those who do not choose to do so may let it alone. Still, in this way, nearly all the valuables in the country come into the Kaan's possession.

"When any of those pieces of paper are spoilt—not that they are so very flimsy neither—the owner carries them to the Mint, and by paying three per cent. on the value he gets new pieces in exchange. And if any Baron, or any one else soever, hath need of gold or silver or gems or pearls, in order to make plate, or girdles, or the like, he goes to the Mint and buys as much as he list, paying in this paper money.

"Now you have heard the ways and means whereby the Great Kaan may have, and in fact *has*, more treasure than all the Kings in the World; and you know all about it and the reason why."[17]

The question naturally arises what this paper money looked like that was issued in such quantities for four hundred years before the invention of printing in Europe, and that was regarded with such interest by so many of the early European travellers in China. Among the many Chinese notes held by museums and private collectors that claim early date, it is necessary to select those whose genuineness is unassailed.[18]

The Russian expedition under M. Koslov discovered at Karakhoto in Mongolia several of the notes that were there in use during the period of Mongol domination. The inscription on them is in the square Mongol character. They represent not the currency of China that was described by Marco Polo, but the currency that was in use in Mongolia itself. The notes are badly damaged, but are still in part legible.[19]

A considerable number of notes of a later issue, found at Peking, are even more valuable in reconstructing the paper money which Marco Polo described. During the looting of the Palace

precincts at Peking after the Boxer uprising in 1900, an image of Buddha had been thrown down by some European soldiers, and in the pedestal were found gems, jewelry, ingots of gold and silver, and finally a bundle of notes. The notes, being of no intrinsic value, were handed to a bystander, a surgeon in the United States army, and notes from that bundle have now found their way to museums in Shanghai, New York, London, Berlin and elsewhere. These notes were found to have been issued during the reign of Hung Wu (1368–1399), and, as the only recorded issue of paper money during that reign was in the year 1375, that date has been tentatively assigned to them. That they are genuine notes of Hung Wu's reign has not been questioned.

These notes are a foot long by eight inches wide. They are printed on heavy paper of a dark slate color. The value, one thousand cash, is shown not only by the text, but also by a picture of a string of cash, divided in piles of a hundred each. What is of greatest interest is the clear distinction between print and seal. The text and ornamentation is in black and is a good example of careful printing, not engraved, but excellently printed from a well cut plate of either wood or metal. The seals on the contrary, which are to these notes what the signature is to ours, are roughly stamped in red. The seals and the print are as clearly distinguished and bear much the same relation in appearance as the postage stamp and the post-mark on a modern letter.

While the probable date of these notes is about seventy years after Marco Polo's description, and seven years after the fall of the Mongol Dynasty, there is every reason to believe, from the descriptions of Chinese, Arabic and European writers, that the earlier notes were very similar to these that have come down to us.

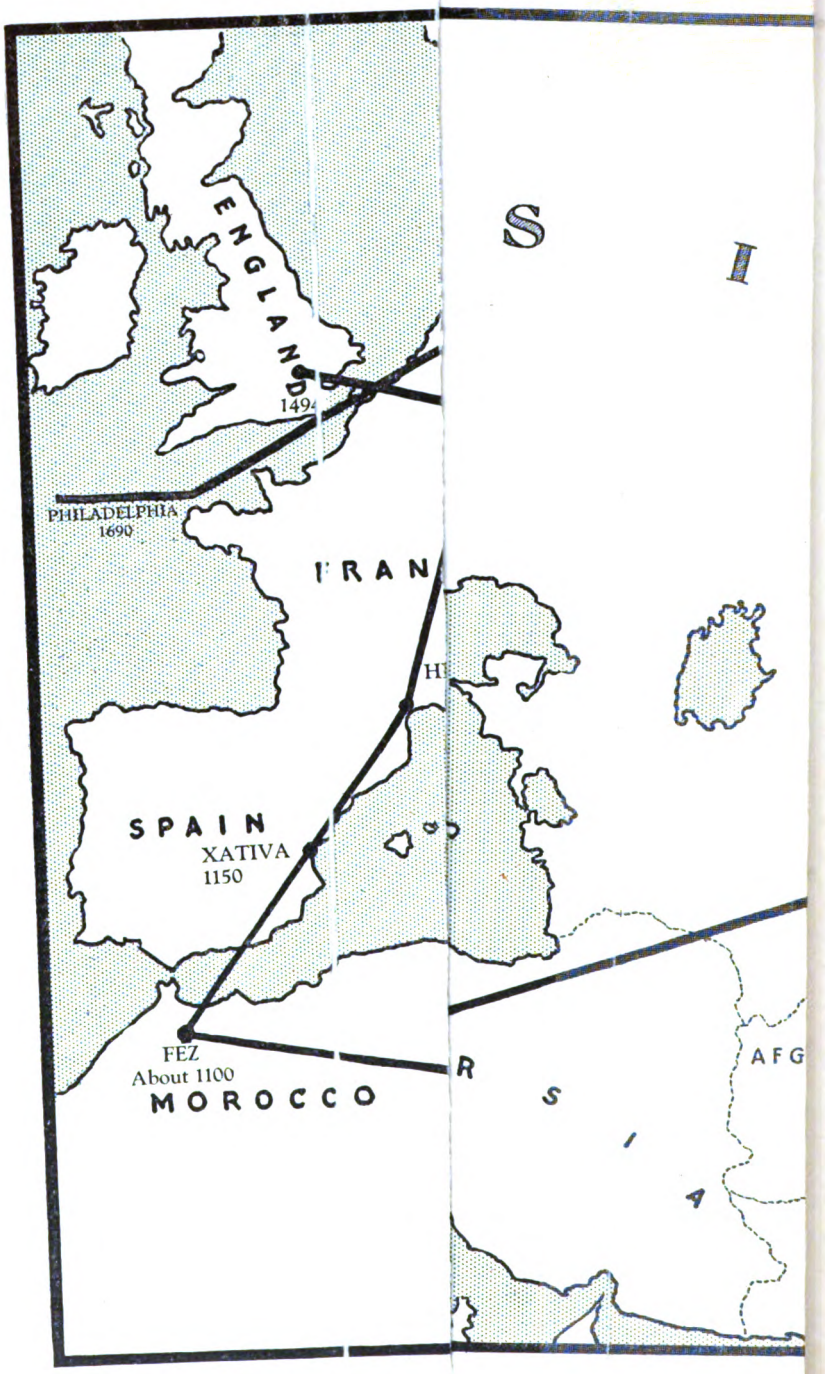
If a full series of notes were available, it would throw much light on the early history of printing. From the "laundry ticket" receipts for goods or cash deposited, that were called "flying money" in the ninth century, to these beautifully printed and sealed notes of the fourteenth is a long development. Indications are that this development took place in the main early, and that

the form of the notes during the last two or three centuries was fairly constant. During this early period, while the seal was developing into the true block print in Buddhist monasteries, it would be interesting to know whether in commercial circles a similar and independent development was going on that culminated in the private bank notes of Szechuen in the tenth century.

But that is speculation. The clear facts that concern this history are that during the four centuries before Gutenberg a form of printing was going on that issued not only millions, but actually billions, of notes, and scattered them to every hamlet in China, that this printing of paper money extended at one time as far west as Persia (Tabriz), and that it was so interesting to European travellers that no less than eight of them described it.

PART III

THE COURSE OF BLOCK PRINTING WESTWARD



CHAPTER XII

EARLY COMMERCE IN THOUGHT AND IN WARES ALONG THE GREAT SILK WAYS

TO understand the westward movement of printing it is necessary to form some picture of the ways by which early culture passed between the West and the Far East. The idea that the history of China has until recent times been a closed compartment, affected by nothing and affecting nothing in the Western world, is being rapidly dispelled by investigation. Each new journey of exploration into Central Asia and each new study of ancient literature makes it possible to follow a little further the silken thread that has bound the civilization of the West to that of the distant East. Imperial Rome wanted silk, China had it. Here is the key to the development of a great caravan route that crossed Turkestan, Persia and Syria, and reached the Mediterranean at the ports of Phenicia and Palestine.

Modern scholarship has not yet answered the question why the Birth of Thought—the age of Confucius, of Buddha, of the Hebrew prophets and of the early Greek philosophers—came to the widely separated lands of ancient culture at the same time. Much less has it explained that earlier Neolithic pre-civilization that developed similar stone implements and even similar pottery designs at various places along the route from Greece to China.[1]

With the establishment of Roman dominion in the West and the Han Dynasty in China, the connection between East and West first begins to emerge into the light of history. Somewhere about B.C. 170 a tribe known to Chinese annals as the Yüeh Chih, and later to the Greeks as Indo-Scythians, a people probably of Indo-European origin, living within the borders of China in what is now the province of Kansu, left their ancestral home and moved westward. Within a little more than two centuries they had conquered

the eastern provinces of what had been Alexander's empire, and had shown their ability to absorb diverse elements of culture by striking coins in Greek style, bearing the effigies of the gods of Greece, of Persia, of Egypt, and of India and even portraits of Augustus Caesar and of Buddha. All the gods, including Buddha (who looks strangely like Apollo) are clearly labelled in Greek. It was in this Indo-Scythian empire that Buddhism was transformed to suit its more cosmopolitan environment, and that the new Buddhism started on its long journey eastward to China and Japan. At the court of one of the Indo-Scythian kings, some time before their Buddhist and coin-striking days (cir. B.C. 126), Chang Ch'ien, an emissary of the Chinese emperor, gained for China its first clear reports of the lands of the West. Chang Ch'ien also brought back the seeds of alfalfa and the grape vine, which were planted in China by the Emperor, and are, so far as known, the first plants introduced into China from the West.[2] In the wake of Chang Ch'ien's mission came the Chinese conquest of Eastern Turkestan, opening up the pathway across the Indo-Scythian kingdom to the Roman Orient, and with this conquest came an enlarged silk trade. Armies, ambassadors and caravans were sent frequently to the West, one Chinese embassy in the year A.D. 97 got as far as the Persian Gulf and was deterred from going on to Rome only by the reports which they heard of a "kind of homesickness which men have when they are long upon the sea." The first travellers recorded from Rome to China came by sea as far as Tongking in the year A.D. 166, and were led from there overland to the Chinese capital, Lo-yang. They are known in the Chinese annals as envoys from the Emperor An Tun, who has been identified as Marcus Aurelius Antoninus.[3]

During this period silk was the chief article of export from China, the Chinese keeping the process of silk production a strict secret. Roman writers thought of silk as a vegetable product, which was stated by Virgil to be combed from trees. Silk came into the Roman Empire in ever increasing quantities during the classic period, and continued to come into Constantinople after

Rome had fallen. The re-opening of the silk routes was one of the central features of the foreign policy of Justinian (A.D. 527–565) and his immediate successors. These routes had been closed by the Sassanian power in Persia out of fear of the fast growing Turkish kingdom on the northeast, which was at this time first heard of in western history. Justinian tried to interest the king of Abyssinia and certain Christian princes in India in a project to open a new trade route with the East that should avoid the Persian dominion altogether. When this plan fell through owing to the lethargy of the king of Abyssinia, advantage was taken of an embassy from the Khan of the Turks, and a return embassy was sent in 568 around north of the Caspian Sea to the Turkish court (in Turkestan) and an alliance formed, the purpose of which was to compel Persia to allow a resumption of the silk trade.

Meanwhile some Nestorian priests returning from the East had brought to Justinian the astonishing 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 either to China, or—more likely—to the kingdom of Khotan in Chinese Turkestan, whither silk culture had been brought in the year 419 by a Chinese princess.[4] To avoid detection as they carried the precious eggs over the frontier, they hid them in the long bamboo staff that one of the priests carried. From the eggs carried in this bamboo staff—if the story told by the Greek chroniclers is to be credited—are descended all the silkworms that have been reared in Europe down to modern times.[5]

The century after Justinian saw marked changes in the face of Asia. Two great empires, that of the T'ang Dynasty in China and that of the Caliphs in the West, had divided most of Asia between them, and the two empires had met in Turkestan. From this time on it was the Arabs who supplied Europe with silk. Imported silk they drew from China through Samarkand. Silk culture they learned from Constantinople. Throughout the Middle Ages Europe bought the bulk of its silk—both Chinese silk and silk of

Arabic manufacture—from the Arabs. Not till the Crusades were well under way did the art of silk culture become known in Western Europe, being first introduced into Italy in the thirteenth century and into France in the fourteenth.

Silk was thus, so far as known, the first of China's great gifts to the West, reaching Europe some time before the Christian Era; but the art of producing silk, like most Eastern arts, reached Western Europe only through the Crusades.

To-day there is no part of the world, except the Polar Regions, less known and less often traversed by civilized man than the lands that lie between China and the Near East. Some Germans, escaping from internment in China during the World War, were reported in the newspapers to have made the journey, and it was thought at the time to be an incredible feat. This is the one great trade route of the world where the means of communication are poorer to-day than they were one or two thousand years ago. Other ways of commerce by sea and land have opened up and have left the ancient route from China to the Western world scarcely even a memory. It is hard to-day to imagine that great highway over which the world's long distance caravans plied to and fro. Two or three years were spent on the journey—often more, for it is seldom that one man or one caravan made the whole trip. Men of all races and creeds relayed the silks of China and the varied wares of the West stage by stage over the long road. Great cities grew up, both in the fruitful lands and in the oases of the desert along this now deserted trail. Turfan and Capernaum, cities at the two extremes, that once profited by being near the great trade route, to-day are ruins. Samarkand and Bagdad have lost their glory. But there was a day when that whole road lay through the lands of prosperous peoples who gathered together the elements of culture from all the East and all the West, an eclectic and cosmopolitan culture that has been buried and preserved wherever the route lay across what is now desert, especially in Chinese Turkestan.

Nor was it through a short period that this prosperity of the

cities along the Silk Ways continued. Whether Western Asia was ruled by Caesar or Caliph, Western Asia loved to clothe itself in silk, and Western Asia had products that it was willing to send in exchange. Great empires—the Romans, the Indo-Scythians, the Caliphs and the T'angs of China—facilitated the trade, which continued to grow till finally in the Crusades Europe broke through and began to have her part also in the traffic along the Great Silk Ways.

Owing to the fact that until the later Arab period goods were generally carried by relays and few caravans went the whole distance, people at the one end of the line knew very little about people at the other end. But that did not prevent ideas and products from making the long journey, even though the recipients seldom knew from whence they came. Pliny called the apricot and the peach "Armenian tree" and "Persian tree," little knowing that the Armenians and Persians had received them from China.[6] Aristophanes called chickens "Persian birds" without realizing that chickens came from Burmah.[7] When Saladin made a present of porcelain to the Sultan of Damascus, he called it Chinese, but when some centuries later porcelain began to be manufactured in Venice, it was called Arabic.

So during the long period from Roman times down through the Middle Ages there was a steady give and take. The peach and the apricot, silk and tea,[8] porcelain and paper, playing cards,[9] and probably gunpowder and the compass were among China's gifts to the West. The grape and alfalfa, the carrot,[10] glass manufacture,[11] Nestorian Christianity and Mohammedanism, the alphabet,[12] and some impulses of Greek art were a few of the things that the countries of the Far East received in return.[13] Laufer traces the history of some twenty-four agricultural products, the knowledge of which was carried westward from China to Persia or beyond from the Christian Era down to Mongol times, and sixty-eight that were carried in the opposite direction.[14]

The greatest gifts of Southern and Western Asia to the Far East were their religions, and these formed the closest cultural link be-

tween East and West. The advance of Buddhism from India through Central Asia to China and Japan is well known. Less known but of great importance as forming a point of connection across the continent is the advance of Nestorian Christianity and Manicheism.

The latter, the religion of Mani, which was founded in Persia during the third century on a substructure of Zoroastrianism and Gnostic Christianity, and which greatly influenced the thought of the Roman Empire (St. Augustine himself being a Manichean before he became a Christian), has been little known until recent discoveries in Chinese Turkestan have brought to light a large quantity of Manichean scriptures and other writings in Persian, Sogdian, Chinese and certain dialects of Turkish. It is now known to have been the state religion of the Uigurs, whose capital was at Turfan. Certain of the Manichean scriptures were printed in China in the twelfth century (see chapter ten).

Christian missionaries of the Nestorian sect came from Persia and Syria into Chinese Turkestan sometime in the fifth or sixth century. In almost every site excavated by the German expeditions in Turkestan, remains of Christian churches were found, with manuscripts in Syriac and Persian as well as in Chinese and the languages of Central Asia. Even the correspondence of some of these priests with their mother churches in Syria has been unearthed. Recent discoveries tend fully to confirm the record contained in the famous Si-an-fu inscription of the introduction of Christianity into China in the seventh century and of its persistence, both in Central Asia and in China down to Mongol times. The metropolitans of Central Asia and of China were subject to the Nestorian patriarch of Bagdad, a dignitary who, strange to say, was given by the Moslem Caliphs great freedom in the exercise of his authority. During the latter part of the period, by special dispensation the metropolitan of China was relieved of reporting to his superiors in Bagdad except once in four years. At one time (during the Mongol period) a Christian of Turkish extraction from northern China was made patriarch of

Bagdad.[15] The exaggerated reports that reached the Crusaders of the exploits of Prester John have now been traced as referring to the Nestorian king of one of the tribes of Central Asia.

The Mohammedan penetration of the Far East began within a few years after the death of the prophet, when about the year 652 the first Mohammedan envoys reached the Chinese court. From that time Arab trade with China steadily increased. How the early Arabic trading posts flourished is indicated by Abû Zeyd, who, writing about 900, stated that, in the rebellion of 878 in the city of Canton,[16] one hundred and twenty thousand Moslems, Jews, Christians and Parsees, who were there on business of traffic, were killed. Even allowing for Arab exaggeration, there is evidence here that trade between China and the Saracen Empire had already reached large proportions.

The infiltration of religious ideas from the West is again illustrated in the account of the Arab traveller Ibn Vahab, who visited China in the latter part of the ninth century and describes his audience with the emperor. The emperor, after discoursing with considerable accuracy of the five great kingdoms of the world—the Chinese, Turkish, Indian, Arab, and Greek—is said by the Arab narrator to have pulled from a box beside his throne pictures of Noah in the Ark, of Moses and his rod, of Jesus upon an ass, and of the Twelve Apostles. The surprising modernness of this Chinese emperor as seen by his Moslem visitor is illustrated by the fact that though he marvelled at what Jesus accomplished in the short space of thirty months, he combatted the idea that there had ever been a universal deluge and laughed heartily when his Arab visitor tried to tell him that the world had been created only six thousand years.

The Mohammedans in China always retained a close connection with their home base either by sea or across Central Asia. They were under a system somewhat similar to present-day extra-territoriality, and it was not until after Mongol times that they began to be submerged as an integral part of the Chinese people. The large number of Moslems in China to-day, who as a rule are of

Arabic ancestry, shows the extent of this early infiltration and indicates how close must have been the contact between China and the West that was thus established.

In return for religious ideas, which were moving eastward and northward across Asia, China sent back her inventions. Some of the inventions with which the Chinese have been credited still await the research student and nothing clear and definite can be stated until a large amount of careful study has been made. The invention of paper, which has been more fully studied than the others, is described in chapters one and twelve. Though gunpowder and the compass are still obscure in their beginnings, a few words about them as well as about porcelain may present some useful analogies to the student of printing.

It is known that gunpowder was used in the T'ang dynasty, though probably not for warfare. The first use of gunpowder in warfare was in the form of explosive hand grenades, or grenades thrown by various mechanical devices. When the use of these grenades first began is still obscure. They were apparently used in the battles of 1161 and 1162, and again by the northern Chinese against the Mongols in 1232. The Arabs became acquainted with saltpeter some time before the end of the thirteenth century and called it Chinese snow, as they called the rocket the Chinese arrow. Roger Bacon (c. 1214 to c. 1294) is the first European writer to mention gunpowder, though whether he learned of it through his study of Arab lore or through his acquaintance with De Rubruquis, the Central Asiatic traveller, is uncertain. All that can be said certainly is that the use of gunpowder in warfare became known among the Saracens and in Europe very quickly after its first use in warfare in China.[17]

With respect to the compass, the Chinese had known the properties of load-stone since before the Christian era, and during the first millenium after the Christian era there are many curious stories, the interpretation of which is still obscure, with regard to the construction of "south-pointing chariots." The earliest clear mention in Chinese literature (or any literature) of a magnetic

needle is by Shên Kua (1030–1093), the same man who first described movable type printing. The first mention in Chinese literature of the use of the compass for navigation is a little after 1100 but refers to the period from 1086 to 1099. At this time, according to the statement of Chu Yü, it was used by foreign (that is probably Arab or Persian) navigators between Canton and Sumatra. The first mention of the compass in Europe is in a poem by Guyot de Provins about 1190 and again a few years later by Cardinal de Vitry, who visited Palestine in the fourth Crusade, and who describes load-stone as having been brought from "India." The indications would seem to be that the Chinese first knew the use of the compass but had not applied it to navigation;[18] that Arab traders in Chinese waters were the first to use this Chinese device for sailing ships; and that from them the secret was carried to Europe during the Crusades.[19]

The gradual evolution and westward movement of porcelain is better known. As far back as the Han Dynasty (i.e. before A.D. 220) the Chinese had discovered that at a sufficiently high temperature a very fine glaze could be obtained with powdered felspathic rock mingled with lime. It is not, however, until about the seventh or eighth century that this glazed pottery was so perfected that it can be called porcelain. The first appearance of porcelain in the Near East was in 1171 (or 1188) when Saladin sent a present of forty pieces of Chinese porcelain to the Sultan of Damascus. Porcelain manufacture was not known in Europe till after the Crusades. It is first mentioned in 1470 in Venice and the statement is made that the Venetians learned the art from the Arabs.

It is in this world of varying and increasing currents of trade and intercourse that block printing started on its westward way. The trade that began under the wide empires of the Caesars and the Hans and was furthered by the Caliphs and the T'angs, reached its culmination in the time of the Mongol Empire and the Crusades. Immediately after the Crusades new ideas of all sorts, some of which had their origin in the East, began to sweep

over Europe. Whether or not the discovery of printing, that foundation stone on which modern education is built, is one of the gifts which Europe received from the East through the medium of the Mongol Empire and the Crusades, will be the subject of investigation in the next chapters—the discussion in Part Three being confined to Block Printing and in Part Four to the use of Movable Type.

CHAPTER XIII

PAPER'S THOUSAND-YEAR JOURNEY FROM CHINA TO EUROPE

PAPER has everywhere been the forerunner of printing. Without this strong economical material, printing could never have made headway. Moreover the westward movement of paper not only prepared the way for printing, but its history is often suggestive of the ways in which printing may have travelled. In order to investigate the course of block printing, it is therefore necessary to understand clearly the history of paper. This history of paper is open before us. As compared with that of block printing, the advance of paper was a triumphal progress, hailed by literary men, and displacing quickly the old writing materials in every place it touched. Typography later met with a like welcome, first in Korea, then in Europe. But block printing was always in its beginnings an obscure and despised art, whose history can be traced only with the greatest difficulty. A study therefore of the progress of paper affords the best introduction to the more difficult study of the westward course of the block printing which followed in its wake.

The invention of paper from hemp, tree bark, fish nets and rags, as officially announced to the Emperor of China in the year A.D. 105, has been described in the first chapter. The history of the later Han Dynasty, written about 470, states, "From this time on it was used universally." Other references confirm the impression that its spread through China was very rapid. West China is especially noted by several writers as one of the early seats of the paper industry.[1]

The first point at which paper is met on the journey from China westwards is one of the watch towers of a western spur of the

Great Wall. In this ruined watch tower near Tun-huang, amid a mass of documents written on wood and one or two on silk, Dr. Stein discovered nine letters which are without doubt the earliest bits of paper that have yet been found. They are neatly folded sheets about sixteen inches by nine, each contained in an addressed wrapper. Microscopic examination shows that the material is a pure rag paper. The language is not Chinese like that of the surrounding wooden slips, but Sogdian, an Iranian language written in a script derived from Aramaic. None of the letters are dated, but as the Chinese documents in these watch towers cover the years A.D. 21–137 (one possibly 152) it seems certain that the garrisoning of the watch towers ended at about the middle of the century, and that the paper there found must have come from the first half century after Ts'ai Lun's official announcement of his invention. In another watch tower were found several fragments in Chinese, which are presumably of about the same date. Gradually paper made its way westward in Turkestan. The earliest paper found by Sven Hedin's expedition—up to that time the earliest paper known—was found at Loulan, and is believed to date from about A.D. 200.[2] Each of the older sites excavated in Turkestan yields both wood and paper as writing material. At several places the gradual displacement of wood by paper in the third, fourth and fifth centuries can be traced. At Loulan for example, abandoned about A.D. 350, some twenty per cent. of the many documents found by Dr. Stein are on paper, the balance on wood.

At Turfan the oldest paper found by the Prussian Expeditions dates from 399. Here paper coming from the east met the culture currents that were coming from the west and south. From here we have early Aramaic texts on paper, and even some three or four words of Greek. Also written on paper is a fragment of a Bible manuscript (from the Book of Psalms) in Persian, which has by some been dated as early as 450. The early paper from Turfan includes Manichean texts, Buddhist canons, and a variety of

Christian literature—among other things a delightful fairy story based on the visit of the Wise Men to Bethlehem.

Step by step paper penetrated around both edges of the Taklamakan Desert, till by the end of the fifth century, through all the Central Asian territory which then as now was under Chinese control, except in certain backward spots, the use of wood for writing had stopped and paper was in general use.[3]

In the early years of the eighth century the Arabs mastered what is now known as Russian Turkestan. Here in July, 751, paper manufacture entered the Arabic world and started on its career from Samarkand to Spain. The circumstances are related in detail in the Arabic annals. There was war between two Turkish chiefs. One appealed for help to China, the other to the Arabs. The Arabs defeated the Chinese army and drove them back as far as the Chinese frontier. Among the prisoners taken were some paper makers, who taught the art of paper making at Samarkand.[4] The Chinese annals of the T'ang Dynasty describe the same battle and the date exactly agrees.[5]

The Arabic report states that the paper introduced into Samarkand was made of "grasses and plants." On the other hand, all early Arabic paper that has come down to us, including the great Rainer collection, is rag paper. An examination of a number of papers of just this period from Eastern Turkestan (768–787) shows that they are made of a mixture of rags and raw fibers, the raw fibers predominating.[6] The Arabs seem to have found difficulty in getting all the materials that had been used by the Chinese and made their paper wholly of rags, like the earlier Chinese paper found by Stein in the Great Wall.

"Paper of Samarkand" soon became well-known through the Asiatic dominions of the Caliphate—so much so that a century later (869) Juhith wrote, "The papyrus of Egypt is for the West what the paper of Samarkand is for the East." A writer of the eleventh century, Tha'ālibī, writes, "Among the specialties of Samarkand that should be mentioned is paper. It has replaced the rolls of Egyptian papyrus and the parchment which were for-

merly used for writing, because it is more beautiful, more agreeable and more convenient. It is found only here and in China. The author of the work 'Journeys and Kingdoms' tells us that paper was brought from China to Samarkand by prisoners. It was Ziyad, son of Salih, who took those prisoners, among whom were found the paper makers. Then the manufacture grew and not only filled the local demand but also became for the people of Samarkand an important article of commerce. Thus it came to minister to the needs and well-being of mankind in all the countries of the earth."

But long before this a rival factory had started at Bagdad. In the year 793–794 Harun-al-Rashid of Arabian Nights fame brought Chinese workmen for the starting of the first paper factory in the capital. Bagdad however does not seem to have seriously rivalled Samarkand as a source of supply.

Already in the tenth century we find Arabic scholars debating with warmth whether the Omayyids or the Abbassids had the honor of the introduction of paper at Samarkand, the change of dynasty having occurred in 750.

The third factory recorded in the Arabic empire was on the south-east coast of Arabia. The fourth was Damascus. It was Damascus that for several centuries was the main source of supply for Europe, paper in Europe being generally known as *charta damascena*. Mambij or Bambyx, another Syrian town, seems also to have given its name to paper in Europe, with strange consequences. For *charta bambycina*, paper of Bambyx, was corrupted to *charta bombycina*, paper of cotton, and from the time of Marco Polo down to 1885, when the view was disproved by the microscopical investigations of Dr. Wiesner, Arabic paper and early European paper have always been known as "cotton paper" and the invention of rag paper was attributed to the Germans and Italians of the fifteenth or sixteenth century.[7]

But while Damascus became the center of the *export* of paper to Europe, the secret of its *manufacture* was destined to enter Christendom by a longer route. It had come the full length of

Asia; it was yet to go the full length of North Africa and enter Europe through Saracen Spain.

Paper in Egypt has special interest because it is here in the desert that almost all the old Arabic paper has been found—just as the desert of Turkestan has been the storehouse for old Chinese paper. The Erzherzog Rainer collection at Vienna contains more than twenty thousand documents on paper dating from about 800[8] to 1388. It is the examination of this Egyptian paper which has thrown the greatest light on the history of paper manufacture.

The steady displacement of papyrus by paper is interestingly illustrated by the dated documents in this collection. Of the second century of the Hegira (719–815) there are thirty-six dated documents all on papyrus. From the following century (816–912) there are ninety-six documents on papyrus and twenty-four on paper. From the fourth century (913–1009) only nine are on papyrus and seventy-seven on paper. The last papyrus dates from 936.

A polite letter of thanks, whose date lies between 883 and 895, closes with the words, "Pardon the papyrus." As the letter is written on a most beautiful piece of papyrus, the writer is evidently apologizing for not using paper, which although just introduced from Bagdad or Samarkand, was already the stylish material for letters.

A Persian traveller, writing about 1040, recorded with surprise how in Cairo "the venders of vegetables and spices are furnished with paper in which everything that they sell is wrapped." A physician from Bagdad, writing a century later, tells the source of this wrapping paper used by the grocers: "The Bedouins and fellahs search the ancient cities of the dead to recover the cloth bands in which the mummies are swathed, and when these cannot be used for their clothes, they sell them to the factories, which make of them paper destined for the food markets." Let us be grateful that no paper mill was set up to use the textiles in the tomb of Tutankhamen!

From Egypt paper manufacture passed to Morocco and thence to Spain. The first clear mention of the making of paper in Spain —which is also the first in Europe[9]—indicates already a well established industry. It was in 1150 that El-Edrisi said of the city of Xativa, "Paper is there manufactured, such as cannot be found anywhere in the civilized world, and is sent to the East and to the West."

For a century still, the paper manufacture of Spain was altogether in Saracen hands, 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, though for still another century Europe's needs were largely supplied by paper from the Saracen mills of Damascus and Spain.

So for its first six hundred years paper making was a Chinese monopoly, till taught to the conquering Arabs by Chinese prisoners at Samarkand. For the next five hundred years paper making in the West was an Arab monopoly till the Arabs in turn taught their Christian conquerors in Spain, and Christendom made ready to take the lead.

Meanwhile paper was entering Europe by two other routes. Paper of Damascus was becoming a large article of commerce, chiefly through Constantinople, and paper from Africa was entering through Sicily. It was probably by the latter route that the manufacture of paper penetrated into Italy.

The earliest extant paper document from Europe comes from Sicily. It is a deed of king Roger, written in Arabic and Latin, and dated 1109. A manuscript on paper, a part of which dates from 1154, is still preserved in the archives of Genoa. Emperor Frederick II. in 1221 forbade the use of paper for public documents, but the prohibition was not altogether effective. The import into Italy of paper from Damascus increased steadily through the thirteenth century. By 1276 the first Italian paper factory had been set up at Montefano, in the same year that witnessed the first recorded manufacture of paper by Christians in

Spain. Italian paper manufacture spread rapidly, and Italy in the fourteenth century soon rivalled and then out-stripped Spain and Damascus as the source of Europe's supply.

In Germany the use of paper increased steadily during the fourteenth century, especially during the latter half, but all paper was imported—largely from Italy. Toward the end of the century, when block printing first appeared, South Germany was buying its paper supply from Venice and Milan, and the Rhineland from France, though import from Damascus had not altogether ceased. The use of the new writing material was just beginning to be general. Its employment was not yet as common as that of parchment. Nuremberg, which was one of the earliest centers—perhaps the birthplace—of the block printer's art, has also the honor of being the first place in Germany, so far as known, where paper was made.[10] This first paper mill was started in 1391. The date of the earliest block printing is uncertain, but it was probably at just about the same time.[11]

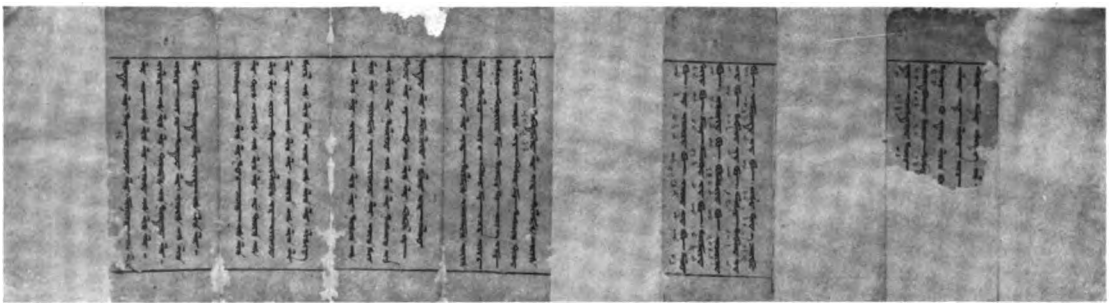
The slow advance of paper manufacture in Europe, which can readily be seen from a glance at the accompanying chart and map, is in startling contrast to the very rapid advance of printing when it once started on European soil. Paper seems to have advanced less rapidly in Europe than it had advanced either in China or in the Arabic world. The European parchment with which paper had to compete was a far better writing material than either bamboo slips or papyrus. Furthermore, there were few in Europe who read, and the demand for a cheaper writing material, until the advent of printing, was small. While it was the coming of paper that made the invention of printing possible, it was the invention of printing that made the use of paper general. After Europe began to print, first from blocks and then from type, paper quickly took its place as the one material for writing as well as for printing, though, strange to say, the first paper mill in England was not set up till seventeen years after Caxton began to print.[12]

CHAPTER XIV

THE PRINTING OF THE UIGUR TURKS IN THE REGION OF TURFAN

THE important position held by China's western borderland in the early history of block printing has already been noted. Both the earliest literary references and the oldest prints that have been found come from the two far western provinces of Szechuen and Kansu, while printed books of the eleventh century have even been found across the border in Mongolia. Though the better preservation of documents in such places as Tun-huang and Kara-khoto is chiefly due to the climate, yet there can be little doubt that the earliest printing centers were in the western part of China, and that from this part of the country the new art spread not only eastward but westward. The region where the greatest quantity and the greatest variety of early block prints has been found is the oasis of Turfan in what is now Chinese Turkestan.

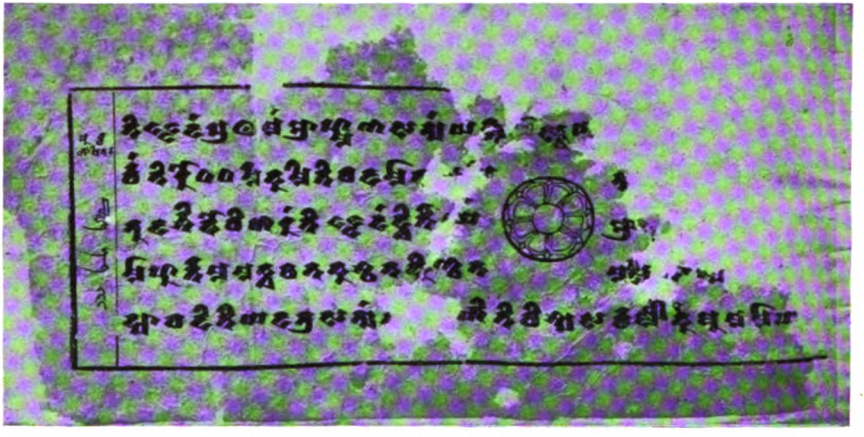
This oasis of Turfan, some four hundred miles northwest of Tun-huang, is a strange depression in the earth's surface almost as deep as that of the Dead Sea, and surrounded on all sides except that toward China by high mountains. An Indo-European people developed the first recorded civilization in the Turfan basin, going back to a period before the Christian era. In the early centuries after Christ, Buddhism swept through the region, bringing in its train a highly developed literature and art. Manichean and Christian (Nestorian) missionaries began coming to the Turfan oasis about the fifth or sixth century and their influence soon rivalled, though it never displaced, that of the Buddhists, bringing into the country a considerable element of Persian and even Byzantine culture. In the seventh century the oasis was conquered by the Chinese and from that time on down to Mongol times Turfan



A BUDDHIST SUTRA

Printed in the language of the Uigur Turks, with interlinear notes in Sanskrit and page numbers in Chinese. The book, like most Buddhist literature of the period, was folded like a railway time table and not bound. Only a small fragment is here shown (11 x 30.5 cm.)

Museum für Völkerkunde.



LEAF FROM A SANSKRIT BOOK PRINTED TO IMITATE THE POTHI OR PALM LEAF BOOKS OF INDIA

Sanskrit manuscripts and even printed books were often made up like the ancient books of India that had been written on palm leaves. Such books are known as *pothi*. When the folded book came into use, and the hole in the center was no longer needed for binding, a hole was still printed in—often a highly conventionalized hole—as seen in this illustration.

About twelfth or thirteenth century

(15.9 x 31 cm.)

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was usually more or less under Chinese control, though the hand of Chinese overlords was rather lightly felt, and the country was left to develop its own peculiar institutions. More important was the conquest by a powerful Turkish tribe called the Uigurs in the eighth and ninth centuries, for these Uigurs soon made Idiqut, near the modern Turfan, the capital of their empire, and adopted as their own the older civilization that they found.

From this time Turfan, located as it is in the very centre of Asia, may be said to have been a focal point where culture streams of all Asia met, open on the south and west to the religious influences of India, Persia and Syria, open on the east to the political hegemony of China, and on the north forming the cultural center of a loose empire that stretched far away over the nomad tribes of Mongolia and even Siberia. The Uigur civilization came to its height in the ninth and tenth centuries of our era, but Turfan remained an important cultural center till after its conquest by the Mongols under Jinghis Khan.

This Turfan basin was first excavated by the Prussian Expeditions of Dr. Grünwedel and Dr. von Le Coq in the years 1902 to 1907. The results of these excavations, including a large quantity of woodcuts and block prints, are in the Ethnological Museum at Berlin.

It is the mingling of races and religions that gives to the Turfan discoveries their peculiar fascination. Chinese and swarthy Indians, Turks and blue-eyed, fair-haired mountaineers of Indo-European race, all stand out clearly in the wonderful wall frescoes, while the manner of portrayal is a blending of the art of Greco-Indian Gandhara with that of China, not to speak of considerable Persian or Iranian influence.

Nor is there less mingling in the domain of religion. Side by side stood the churches of the Christians and the temples where Buddhists and Manicheans seem to have worshipped together.[1] All three religions flourished during the period before the Turkish conquest, and the conquest of the country by the Uigur Turks brought little change, except that Manicheism became the religion

of the reigning house. Christianity was apparently always tolerated and Buddhism encouraged by the new overlords. Islam, though sweeping over the lands directly to the west, left the older religions in the Turfan basin undisturbed till after Mongol times. Manicheism was the religion of the royal house, Buddhism that of the majority of the people, Nestorian Christianity that of the minority. The Confucian culture of Chinese overlords made little impression.

Needless to say, Turfan was a polyglot community. Seventeen different languages are represented among the documents found by the Prussian expeditions, including Syriac, Persian, Sanskrit, Chinese and a few words of Greek, as well as the local Tocharian and Turkish. Some of these appear in as many as four or even five different alphabets. There seems to have been a mania for fitting new alphabets to the various languages of the oasis.

Back of all this literary, linguistic and art activity was the religious impulse. It is in the ruined monasteries and temples that the ancient documents have been preserved. Christian scriptures, Manichean hymns and prayers, and, more than all, Buddhist sutras, form the bulk of all the manuscripts found.

In this melting pot of race, language and religion, with its high valuation of literature and art, block printing early found itself at home. It has already been pointed out how Buddhism had a particular genius for reduplication, and some of the earlier, cruder manifestations of that genius as found in the Turfan monasteries have been described. It is a significant fact that all the block printing of Turfan so far found is Buddhist. As in China and Japan, it was the instinct of the Buddhist for repetition and reduplication to which the new art specially lent itself.

Woodcuts and block prints were found in almost every site excavated in the Turfan region. Toqsun at the western edge of the Turfan oasis is the most western point at which Central Asiatic block printing has been discovered.

The state of preservation of the Turfan texts is very different from that at Tun-huang. In contrast to the neatly piled rolls of an

undisturbed sealed chamber, the Turfan manuscript treasures show signs not only of the natural destruction of the centuries, but of wanton destruction as well. In certain of these monasteries the floors were littered with papers, all either hacked to pieces, or else crushed, piece by piece, by hand. In the monastery at Idiqut, for instance, the floor was covered knee deep with this "waste paper." One could have carried away many hundred pounds of it. In the midst of this deposit were the corpses of several Buddhist priests, evidently killed while the systematic destruction of their library was going on. Manichean documents were mingled with those of Buddhist origin, but, whether by design or by accident, they do not seem to have been so thoroughly destroyed. One box of this deposit that I examined at Berlin—a box that had remained packed away ever since it came from Turfan and from all appearances might have been the crumpled-up contents of a waste-paper basket in a modern Chinese school-room, plus a generous accumulation of dust—contained, among crumpled and torn manuscripts in Uigur, Sogdian, Chinese and Sanskrit, a dozen very primitive Buddhist woodcuts, two printed texts in Uigur, a sheet of stamped Buddhas (hand-colored), a Chinese manuscript with a stamped Buddha at the top of each column, several bits of silk with Buddhist figures stencilled upon them, and a bit of printed silk.

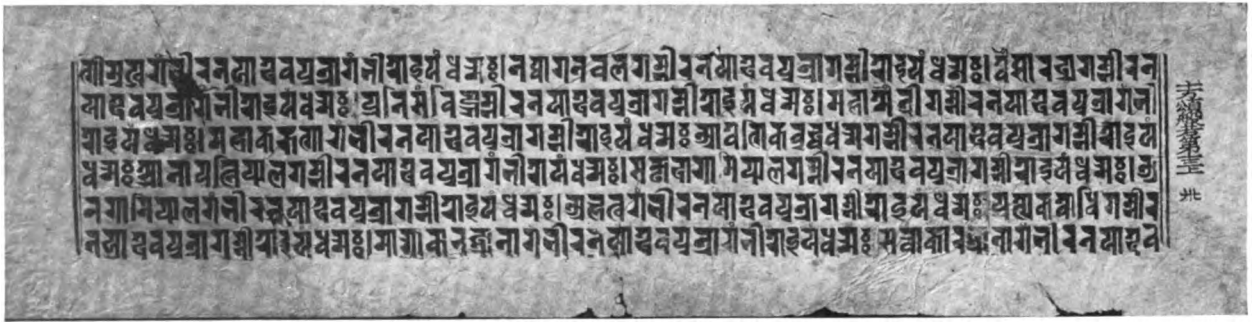
Most of the printing of the Turfan region has had to be rescued from such crumpled deposits. But one notable exception is the monastery at Murtuk, in which a large proportion of the best block prints were found. This monastery seems to be later than most of the others. Perhaps its documents were produced after the persecuting zeal that destroyed the other libraries had spent itself. Murtuk as compared with other sites is remarkable for three things—a larger proportion of its documents is printed, its printing is better done, and its printing is far better preserved.

Of all the printed documents found in the Turfan region, not one is dated. Nor is the approximate dating easy, especially of

the earlier pieces. With regard to the later ones, it is possible to speak with more clearness. There are four fragments in the Mongol language, also a beautiful large Sanskrit book in Lantsa script, and a fragment containing the name of Jinghis Khan—all of which could not be earlier than the opening decades of the thirteenth century. Moreover, as it is known that the Uigur civilization did not long survive the drain on its man power caused by the Mongol wars, the date at which the Turfan documents come to an end cannot be much later than the close of the thirteenth century. It may therefore be said with a fair degree of certainty that a number of the best printed pieces—and perhaps a very considerable number—belong to the thirteenth century and the opening years of the fourteenth, when Uigur printing came to its climax and ended. How far back of this the art goes can be only matter for conjecture. It may possibly go back as far as that at Tun-huang or further. It is certain that there is a large amount of very primitive printing and near-printing, which *may* indicate several centuries of development. Some would assign much of the printing in the Uigur language to an early date, because the Uigur civilization rose to its height during the ninth and tenth centuries. But all this is conjecture. Whatever may be the date at which Uigur printing began, there seems to have been continued progress both in quantity production and in quality. Late monasteries like Murtuk are much richer in block prints than the earlier ones, and the printing is better. It may then safely be said that there was during early Mongol times in the monasteries of the Turfan region a highly developed and widely extended printing industry, which had very likely been going on for several centuries.

Six languages are used in the Turfan blockprints: Uigur, Chinese, Sanskrit, Tangut, Tibetan and Mongol, the Uigur, Chinese and Sanskrit prints predominating.

The Uigur books and fragments are in the Sogdian alphabet—an adaptation of Syriac that had penetrated into Central Asia early in the Christian era, and from the Indo-European population had been taken over by the Uigur conquerors. The language



A PAGE FROM THE SANSKRIT DIAMOND SUTRA

The most perfectly printed of the block books of Central Asia. Each page is about two feet long. Title and page numbers appear on alternate pages in Chinese. Thirteenth century or early fourteenth (64 x 15.5 cm.)

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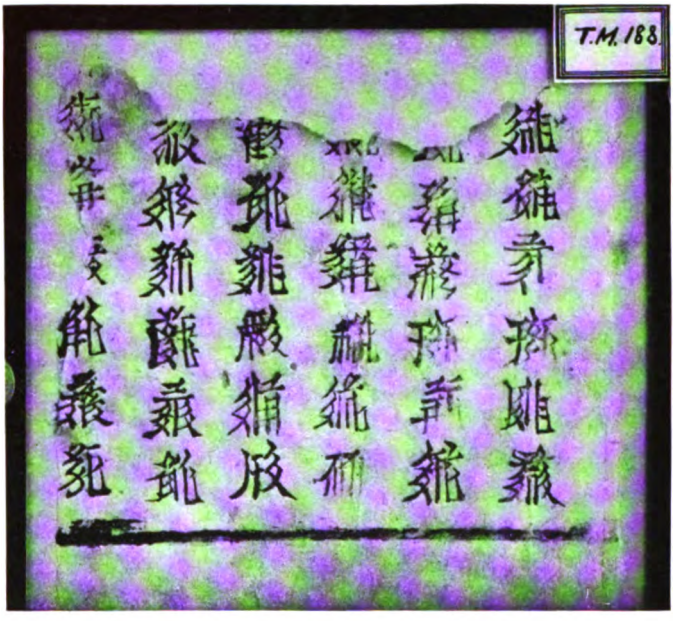


A BIT OF TANGUT PRINTING

The Tanguts were a people akin to the Tibetans who set up a strong kingdom on China's western frontier during the eleventh and twelfth centuries. Their kingdom was destroyed by Jinghis Khan soon after 1200. Block printed sutras in the Tangut language have been found at Turfan, at Tun-huang and at Kara-khoto
(12 x 13.6 cm.)

Museum für Völkerkunde.

is a pure Turkish, which, though not the direct ancestor of modern Ottoman, presents a striking likeness to it. As the books are all translations of Buddhist sutras, they contain many transliterations of Sanskrit names and words. Where this occurs, the Sanskrit original is printed in between the lines, much as English words are introduced in a modern Japanese text. The page numbers in Uigur books are as a rule in Chinese, as is also the title of the book, which appears at the side of many of the pages. These Buddhist printed books in a Turkish language with Sanskrit notes and Chinese page numbers, in a script brought from Syria, are in themselves an epitome of the eclectic character of the Uigur civilization.

The Chinese books, of which there are also a large number, are as a rule excellently printed in the large bold-faced style characteristic of the Sung era. They are better printed and easier to read than any modern Chinese block books. The Chinese books, like those in Uigur, are in the main translations of Sanskrit sutras. Both the Uigur and the Chinese books are usually in the folded form,[2] but there are also a few printed rolls, which may very likely indicate an early date.

The Sanskrit prints are of two kinds. The larger number are in an older script, which shows little change from that which was already in use in Central Asia several centuries before block printing began. A few Sanskrit prints are in the later Lantsa script, which was not in use before Mongol times. The most beautiful specimen of printing in the entire collection is a Sanskrit "Diamond Sutra" in Lantsa script. Each page is more than two feet long by six inches wide, with broad margins and beautiful clear print. The titles and page numbers on every other page are Sanskrit, on every other page Chinese. This Sanskrit edition is later than the Chinese editions of the same book found at Tun-huang, at Kara-khoto and in Japan, and, judging from the script, it may be said with a fair degree of certainty to date from the thirteenth century. It has the unique distinction of being apparently printed on both sides of the page. A close examination

however, reveals the fact that each sheet actually consists of two leaves pasted together with such nicety that the pasting can scarcely be detected.[3]

This, like many of the Sanskrit printed books, retains the Indian form rather than the Chinese. It is a *pothi*, that is, it is like the ancient books that were written on palm leaf in India, many long narrow sheets laid between two boards and bound through with a thong.

The printed books of Turfan afford an interesting study in the competition that was going on between different book-forms—the roll, which was the earlier form both in China and in the West; the folded book, which under the influence of printing had gradually displaced the roll in China; and the Indian *pothi*. The one form lacking is the stitched book, familiar in the West. This omission is interesting, as Christian and Manichean stitched books had begun to circulate in the Turfan region not so very long after their first use in Syria in the fifth century. The stitched book reached China early in the Sung Dynasty (about the eleventh century) and most of the printed books of that period from China that are now extant are stitched. Somehow the Buddhist has never taken kindly to this form. In Turfan it was used in the main by Christians and Manicheans; in China it was the mark of Confucian and secular literature, and as such it came in time to be the usual form, as in the West. The Buddhists always preferred the folded book—or sometimes in Central Asia the Indian *pothi*. In fact a curious form frequently met among the Turfan printed books is a cross between the two—a folded book copied exactly from a manuscript *pothi*, with the old holes for the *pothi* thong copied in the printing.

The Tangut printing is not extensive. It is in a script as yet undeciphered, ideographic and evidently based on Chinese, yet differing radically from Chinese—one of man's very few attempts within relatively modern times to create an ideographic script. It was the language of a powerful kingdom—radically akin to the Tibetans—which held sway in Kansu and adjacent territory dur-

ing the two centuries before the Mongol conquest. This Tangut printing can therefore be dated with a fair degree of accuracy.[4]

The Tibetan prints, though not the oldest, are the crudest of those found at Turfan. They are mostly charms of two or three words each, contained in little clay Buddhas, which have to be broken in order to remove the printed charm.

There are just four fragments of Mongol printing. They are bits of sutras, printed in the 'Phags-pa script that was derived from Tibetan, and not in the more usual script that the Mongols took over from the Uigurs.[5]

The Turfan finds include also a large number of woodcuts and fragments of woodcuts, without text. These are apt to be on very thin paper and rather primitive in workmanship, though there are notable exceptions.

The discovery at Tun-huang of a font of Uigur wooden type belonging to early Mongol times, naturally arouses the question whether any of the Turfan printing, especially that in the Uigur language, could have been done with movable type. This Uigur type will be more fully discussed in a later chapter.[6] All that can be said here is that there is no evidence of the use of type at Turfan. Nor is there evidence to the contrary. The difference between a block-printed book and one printed from such type as that found at Tun-huang would be difficult to detect.

The part played in the spread of printing by peoples of Turkish extraction is an interesting study. The tenth century was a great century for the Turks. During parts of this century, while the Turkish civilization of the Uigurs of Turfan was at its height, Turks of other tribes were ruling China, Egypt and the Bagdad Caliphate. While this vast territory under Turkish rule, stretching from the Pacific to beyond the Nile, did not in any sense constitute a single empire, and while it is doubtful if the Turkish emperors on the throne of China were even aware that men of their own race were ruling in Cairo and Bagdad, it was yet Turkish individuals—adventurers—who had seized the power in all three lands and it was Turkish armies by which they held that

power. The founders of the three short-lived dynasties that ruled China from 923 to 951 were, like their contemporaries in the Moslem empires, Turkish mercenaries, who became sufficiently strong to usurp power. The birthplace of these adventurers in China was in the region of Hami, not far from Turfan. The home of the rulers of Egypt and Mesopotamia was a thousand miles or so to the west across the mountains. Yet in language and racial affinity they were closely related.

The fact that the tenth century was a time in which block printing made such progress—the century of Fêng Tao in China, of most of the block prints of Tun-huang, and possibly of the earliest prints both of Turfan and of Egypt—brings up the question whether there is any connection between the spread of block printing and the spread of the various branches of the Turkish race—an interesting subject for further study. The theory has even been advanced that block printing was primarily a Uigur or Central Asiatic invention.[7] But the little Chinese page numbers on all the Turfan books, whether the language is Chinese, Sanskrit or Uigur, are a sure indication of Chinese workmanship. Block printing comes from China. The fact that a larger number of early prints have been found in Tun-huang and Turfan than in China proper is due to the climate.

The great significance of the printing of the Uigur Turks lies in the fact that the Uigur civilization was taken over *in toto* by the new Mongol empire. The conquest of the Uigur realm was one of the first great achievements of Jinghis (A.D. 1206). From that time not only did the Uigurs form a large part of the Mongol army—they were also the Mongol brains. It was Uigurs who reduced the Mongol language to writing and applied to it their own alphabet. It was Uigurs who did such writing as was needed at the Mongol court. A Uigur was appointed by Jinghis as tutor to his sons "to instruct them in the language, laws and customs of the Uigurs."[8] Under Jinghis' grandsons, the accountants and chief officers of state in Persia and in Mesopotamia were Uigurs.[9] As Turfan, drained of its man-power for the Mongol armies,

dwindled in importance, its culture was transferred bodily to Karakorum, and became the basis of such culture as the Mongols possessed, till it was gradually displaced at the eastward end of the empire by the higher civilization of China and at the westward end by that of Islam. During the lightning campaigns of the Mongols that resulted in the conquest of China, Persia, Mesopotamia and Russia, it was the culture of the Uigur Turks that followed the Mongol arms. And the Uigur Turks were a people that knew well how to print.

CHAPTER XV

ISLAM AS A BARRIER TO PRINTING

FOR several hundred years before block printing came into Europe, all East Asia was printing, from Nara to Turfan—Japanese, Chinese, and Uigur Turks—and through most of this territory printing was being carried on on a large scale. But between the Far East that printed, and Europe where printing was unknown, lay the Moslem world that refused to put its literature in printed form. This barrier between the Far East, where all Buddhist and Confucian literature was being spread abroad in printed form, and Europe where ancient manuscripts were being so laboriously copied by hand in the Christian monasteries, proved in the end to be not impenetrable, but for a time the isolation of Europe from the lands of the Far East was complete.

It is strange that such a literary people as the Arabs—and such a religious people—refused to use this vehicle for the spreading abroad of religious thought. Paper they found in Central Asia—and with almost incredible quickness it displaced all other writing materials from Samarkand to Spain. But not so with printing. The reason for this prejudice is uncertain. It has been suggested that the Moslem suspected hog's bristles in the brush used for cleaning the block, and that to touch the name of Allah with this brush seemed to him the height of blasphemy. It is more probable that mere conservatism was back of the prejudice. The Koran was given in written form, therefore the Koran must always be written. Whatever the reason may be, up to to-day the Koran has never been printed in any Mohammedan country except by lithography. In 1727, when permission was asked by a Hungarian by the name of Ibrahim for the erection of a printing press at Constantinople, the Ulema under Sultan Ahmed III. delivered a verdict that it was against the religion and honor of Islam to allow

the printing of the Koran, because the Koran rested upon written tradition, and must in no other way be handed down. Permission to set up a press was finally given him on condition that the Koran should not be printed, and in 1729 [1] a history of Egypt appeared, but it awakened such opposition that until the nineteenth century no more printing was attempted in Moslem lands, and even through the nineteenth century printing has had to fight against great odds. There was printing done in Syria in the sixteenth century by Syrian Christians. Printing had been done in Arabic in Italy before the end of the fifteenth century,[2] and later the Koran was there printed. Catherine II. had the Koran lithographed in Russia in 1787. But, so far as known, with the exception of the abortive project of 1729 at Constantinople, the Islamic world never printed a book till 1825, when the first press was set up in Cairo.

During all the early period of Chinese printing the Arabic world was in close touch both with China and with Chinese Turkestan, and before the period was over, intelligent Moslems could not have been wholly ignorant of the rôle that was being played by literary and religious printing in the lands to the east. The growth of intercourse across Asia during the T'ang Dynasty has already been sketched. There were trade relations by sea, and relations of many sorts—largely hostile—in Turkestan. With Western Turkestan converted to Islam and under Arab rule, and Eastern Turkestan a part of the Chinese domain, there was naturally a constant interchange—in the course of which paper making entered the Islamic world. This intercourse was somewhat retarded by political conditions in Central Asia during the Sung period, only to be renewed and greatly increased under the Mongol empire.

The extent of Arab penetration of China at this time is borne witness to by the fact that the province of Kansu, the main avenue of Arab trade, is still largely Mohammedan, and that the Mohammedans there, as all over China, have a large admixture of Arab blood. In fact all large cities of China and many small ones have a considerable Mohammedan population, who trace their

descent back to the intermarriage of Arab traders with Chinese women during this period of Moslem penetration that reached its culmination during the Mongol Dynasty. Commerce came by sea as well as by land, the coast cities of South China having been great Arab centers, and having to-day also a large Moslem population.

This peaceful penetration of China by Arab trade is described both by Chinese and by Arabic writers, especially by those of Mongol times. Chou Ju-kua, who was a Chinese inspector of foreign commerce in the province of Fukien some time during the half century before Marco Polo's visit, has left a detailed description, too hazy for that of an eye-witness and evidently derived from Moslem traders, of the various lands of the West from Bagdad to Spain.[3] From the other angle, Ibn Batuta, writing toward the end of the Mongol occupation, gives a wonderful picture of how all China was in his day permeated with Arabs. It is no longer a tale of marvellous things he tells. His description sounds as if such a trip as his were an every day occurrence. In one city after another he is met by the Arab merchants and he notes that they are always organized under a judge and a Sheikh-ul-Islam. But most astonishing of all is the narrative where he tells of casually meeting a man at a feast in Hangchow and discovering that he and his new found acquaintance came from neighboring cities in Morocco, and that they had met a long time before in Delhi. The narrative ends, "I met his brother later in the Soudan; how far these brothers are separated, the one from the other."[4] By the time of Ibn Batuta the world was already growing smaller, and considerable information about China was part of the common knowledge of those who gathered about the bazaars of Tabriz and Cairo and Algiers.

Yet in spite of all this intercourse with the Far East, Arabic books were never printed. Whether, unrecorded and unheralded, there was an obscure block printing activity—the making of charms or playing cards, is another question and will be discussed later. But as far as literature is concerned, the Arabs did not

print. Rashid-eddin, who was grand vizier of Persia during the Mongol period at just the time when Tabriz was the great bridge between the East and the West, and who wrote a clear account of Chinese printing in his world history,[5] seems never to have contemplated having his history printed. Instead, he provided in his will, and left funds for the purpose, that each year two full copies of all his works should be made by hand, one in Arabic and one in Persian, until gradually there should be a complete copy in the mosque of every large city of the Moslem world.

Though Arab culture, that so profoundly influenced re-awakened Europe, knew of Chinese printing, the refusal of its literary men to profit by the art made Islam on the whole a barrier rather than a bridge for the transmission of block printing to Europe. The story of the penetration of this barrier—by the Mongols from the East, by the Crusaders from the West—and of the obscure forms of printing that succeeded in spite of prejudice in finding lodgment in Moslem soil, will be told in the next chapters.

CHAPTER XVI

THE MEETING OF CHINA AND EUROPE IN THE MONGOL EMPIRE

MEDIAEVAL Europe knew almost as little of China as it did of America, for Islam was a barrier well-nigh as impenetrable as the Atlantic Ocean. It was in the early part of the thirteenth century that Jinghis Khan and his Mongol hordes broke through this barrier, and Europe and China stood for a short time face to face. For a century or more—the middle of the thirteenth century to the middle of the fourteenth—the contact between Europe and the Far East was far closer than ever before and probably closer than at any subsequent period down nearly to the nineteenth century. Cathay to travellers from the West was the land of marvels, of wealth and of intellectual culture—a land to be looked up to. For one century and one century only the way was wide open. With the fall of the Mongols the curtain fell, only to be raised a century and a half later, after Europe had passed through the Renaissance.

In the year 1206 Jinghis received the submission of the Uigur kingdom and incorporated into his own rapidly expanding state the brains and the marvellously eclectic culture that had centered about the oasis of Turfan. One country after another was added to the ever-growing empire—parts of North China in 1215, Korea in the same year, Khwarezm (Russian Turkestan) in 1223, Persia in 1231, the balance of North China in 1234, Russia in 1240, Bagdad in 1258, and South China in 1280. Devastating raids were made into Poland, Hungary, Germany, Indo-China and Java and a great navy sent against Japan. Almost the whole continent of Asia was under one rule, and with it was united much of European Russia. Roads were built, and armies, mounted on fast horses, were continually passing to and fro.[1] In their wake came

trade—overland trade between the lands of the Near East and those of the Far East over the Turkestan passes and the Mongolian deserts flourishing as it has never flourished before or since. China and Europe met—a China that for three centuries had been printing books—a Europe that was just waking up to the need of books. Just at the end of the period of Mongol domination the first primitive block prints appeared in Europe. No clear documentary evidence can be produced to show how block printing entered, but certain phases of the history of the Mongol period show points at which Europe was especially exposed to Far Eastern influence. Upon these different phases are based various hypotheses as to route—hypotheses which are not mutually exclusive, and which may show a variety of influences to which the beginnings of block printing in Europe were due.

Block Printing in Mongolia

As already explained (chapter fourteen), it was through the Uigur Turks that the Mongols first came in contact with civilization and with the art of printing. One of the first tasks of Jinghis after he had received the submission of the Uigurs was the conquest of the kingdom or empire of Tangut which had established itself for some two hundred years in northwestern China and eastern Mongolia. The Tanguts were a people of Tibetan stock, but the population over whom they ruled was largely Chinese and Tartar. Like the Uigurs the Tanguts were printers, using the art largely for the duplication of Buddhist sutras. Such sutras in a peculiar ideographic character[2] have been found both at Turfan and at Tun-huang, but the larger number have come from Karakhoto, far out in what is now Mongolia, where they were discovered by the Russian expedition of M. Koslov. Here Buddhism was the religion of the state, and block-printed sutras, both in Chinese and in the Tangut language, were printed by imperial order. With these Chinese and Tangut sutras were found two sutras and some paper money[3] in the language and the character

of the Mongols, showing how the conquerors naturally took over the culture of the conquered peoples.[4]

Printing by the Mongols in China

As the Mongol hordes moved eastward they were constantly in touch with peoples that knew how to print, and as they adopted the culture of conquered lands, it was a culture based on printing that they adopted. As has already been pointed out,[5] printing in China had just reached its highest point of achievement at the time of the Mongol conquest, and during the period of Mongol control there was no diminution in the number of printed books produced. The Mongol rulers made it a point of honor to see that the ancient Chinese literature was printed not only in Chinese but in their own language as well.

The Mongols in Hungary and Poland

After the conquest of North China, the Mongol arms turned westward, penetrating Persia and Russia and even Hungary and Poland. In the invasions of Hungary and Poland, Mongol domination came nearest to the heart of Europe. The great campaign against Poland took place in 1241, immediately after the conquest of Russia. Cracow and other leading cities were burned, Silesia was invaded, and a combined German and Polish army defeated at Liegnitz in German Silesia. So great was the panic throughout Germany that the herring fisheries on the Frisian coast were abandoned, and, according to a contemporary chronicler, herring about the coast of England became so plentiful that they sold in the English market for half their usual price. Meanwhile Hungary was invaded, Buda-Pesth burned, and the whole country ravaged, even a number of cities along the Adriatic coast being sacked. Fortunately for Europe, the death of the Grand Khan Ogatai recalled the Mongol armies. They occupied Hungary only a year, Poland a still shorter time. A second invasion of Poland took place in 1259, a second invasion of Hungary in 1285. In these in-

vasions the capitals of the two countries were again burned, but in neither case was the occupation of long duration.

In these campaigns the Mongol armies came very close to those places where the earliest block printing activities of Europe during the next century were carried on—Venice, Prague, and the cities of Bavaria. Did they leave in their wake anything that suggested the art? The fact that the earlier and more important campaigns were fought before the Mongols had attained a high degree of civilization, and that all the campaigns were little more than raids, without much opportunity for cultural mingling with the people of the land, suggests a negative reply, though the communication of such objects as printed charms or playing cards is not impossible, and more important printed matter, such as religious pictures, may have been in the hands of Uigurs who accompanied the Mongol armies.

The Mongols in Russia

The influence of the Mongol occupation of Russia was far different. Russia was invaded in 1223, conquered in the campaigns of 1236–1240, and held in Mongol hands for more than two hundred years. While distance required the giving of considerable autonomy to the Russian princes, and while Russia was never as directly controlled as were China and Central Asia, yet circumstances made necessary a large amount of travel between Moscow and the court of the Great Khan. Every Russian nobleman of the higher ranks was compelled to go to Karakorum for investiture, at least during the early part of the occupation, and many internal disputes had to be referred to the Great Khan for decision.

Throughout Mongol times the market of Nijni-Novgorod, east of Moscow, was a distributing center for articles from the Far East entering Europe, and here the caravans of China and Turkestan came in contact with the river-borne traffic of the cities of the Hanseatic league. One section of Novgorod is still called the "Cathay Section," and an important street of Moscow "Cathay

Street," in memory of the time when these areas were devoted to Chinese merchants and their wares.

While the hypothesis of Russian agency rests in the main on circumstantial evidence provided by the general history of the period, there are in addition certain clues, a further investigation of which may lead toward more direct evidence.

The seal cutter of the Great Khan Kouyouk (1246–1251) is known to have been a Russian by the name of Cosmas,[6] a fact of importance in consideration of the close connection that existed between seal cutting and block printing.

Furthermore, de Rubruquis states that the currency of Russia under the Mongols consisted of bits of leather or fur "marked with colors."[7] Whether by this is indicated a stamping process or anything allied to printing—after the analogy of the printing of paper money that was going on in the other parts of the empire—is uncertain, but in any case the paper money of China and Central Asia—parts of the same empire and closely connected by trade routes—could not have been unknown in Russia.

The statement that printing came into Europe from China by way of Russia is first made by the historian Jovius in 1550, just a century after Gutenberg, in what is apparently the earliest reference to Chinese printing in European literature. Jovius' statement is, "There are there (at Canton) printers[8] who print according to our own method books containing histories and rites . . . Pope Leo has very graciously showed me a volume of this sort, given as a present with an elephant by the king of Portugal. So that from this we can easily believe that examples of this kind, before the Portuguese had reached India, came to us through the Scythians and Muscovites as an incomparable aid to letters."[9]

Early Embassies from the Pope and the French King to the Mongol Court

John of Plano Carpini was sent by Pope Innocent IV. in March 1245 on an embassy to the court of the Grand Khan. He went by Prague and Kiev to Mongolia, where he presented his letter

A FRAGMENT OF A PRINTED SUTRA IN THE MONGOL LANGUAGE IN SQUARE ('PHAGSPA) SCRIPT

The page numbers are Chinese. Found in the ruins of the old city wall of Chotscho near Turfan. Dates from about 1300 (14.2 x 20 cm.)

Museum für Völkerkunde.

and received his reply. This reply—the original—was discovered by accident in the year 1920 in the archives of the Vatican.[10] It is written in Uigur and Persian and contains in lieu of signature the seal of the Grand Khan Kouyouk (grandson of Jinghis). This is the first recorded appearance in Europe of an impression from a seal based on those in use in China and impressed with ink upon paper.[11] The seal was without doubt made by Cosmas, the Russian seal cutter, of whom Plano Carpini tells. This letter, written in the Persian and Uigur languages, sealed with a Mongol seal of Chinese style that had been cut by a Russian seal cutter, and sent by the hand of an Italian monk to the Pope, is a typical example of the cosmopolitan character of the Mongol Empire, bridging the gap between the Far East and the West.

In 1248 and 1253 two embassies were sent by Saint Louis of France, then in Cyprus on Crusade, to the court of the Grand Khan. The leader of the second of these embassies, William de Rubruquis, in his description of the journey tells of the number of Europeans whom he met at the Mongol capital. Among the prisoners who had been brought from Belgrade and from Hungary and who were still living at Karakorum were the nephew of the Norman bishop of Belleville near Rouen; a French woman from Metz named Paquette who was married to a Russian; an Englishman named Basile; and a Paris jeweller Guillaume Boucher, who was serving as goldsmith to the Khan. Other Westerners at Karakorum in the narrative of de Rubruquis were a Christian from Damascus and an Armenian bishop. The knight Baldwin of Constantinople had just left the court with another knight Templar. All this indicates that even at the beginning of the Mongol régime the men who wrote books were not the only people who went back and forth between the Mongol court and Europe.

De Rubruquis, while not describing printing, is the first European writer to mention printed paper money. In the same section in which he mentions the leather money of Russia, he says, "The ordinary money of Cathay is made of cotton paper, as large as a

hand, upon which they imprint certain lines like the seal of Mangu (imprimunt lineas sicut sigillum Mangu)." [12]

Marco Polo

Marco Polo was the one traveller in Central Asia and China who wrote such a clear account of his travels as to make a deep impression on Europe. For this reason a great variety of things that have come from China to Europe have been credited to him, and block printing is no exception. The story is that a certain Pamfilio Castaldi of Feltre, a block printer at the end of the fourteenth century, had learned the art from seeing some pieces of wood that Marco Polo brought back to Venice and that had served for the printing of Chinese books. The story, while not inherently impossible, rests on insufficient foundation.[13] It is a strange fact that Marco Polo's detailed description of China never mentions printing, except in the passage already quoted on paper money,[14] and there his interest is not in the printing but in the money. If the tradition mentioned above is in any way founded on fact, it is more likely that the blocks seen by Castaldi were brought from China by one of the many nameless travellers who came back to Italy from the Khan's dominions during the half century or more after Marco Polo's return, rather than by Marco himself.

European Missionaries in China

The men of education in mediaeval Europe—the men interested in books—were primarily priests and monks. If the bulk of all scientific study of the life, customs and history of China in later times up to the beginning of the nineteenth century was done by Roman Catholic missionaries, the same must have been still more true in a day when the laity were largely uneducated.

The first missionary sent by the Pope to China, John of Monte-Corvino, arrived in Cambaluc about 1294, just after Marco Polo left for Europe. He remained at Cambaluc as head of the mission till his death in 1328. In 1305 he wrote home that he had already baptized six thousand converts, that he had built a church in

Cambaluc, that he had learned the Tartar language and had translated into this language the New Testament and the Psalter. The next year he wrote that he had built another church in Cambaluc on land presented by a resident Italian merchant, and that he had prepared six pictures, representing scenes from the Old and New Testaments, for the instruction of the ignorant, with explanation in Latin, Tarsic [15] and Persian characters.

In 1307 Pope Clement V. raised John of Monte-Corvino to the rank of archbishop, and sent three [16] Franciscans with rank of bishop to assist him. They worked for five years in Peking, living on a subsidy from the Khan, then moved to Fukien, where a strong mission was established and a church built with funds given by a local Armenian woman. There were missionaries of the Roman Church at the same time at Yang-chou and in Turkestan.[17]

These missionaries, spending their lives in China, learning the language and mingling with the people, must have come in contact with printed literature at every turn. John of Corvino in the first dozen years of his work, even before reinforcements had arrived, had already translated the New Testament and Psalter, and prepared pictures and text for the ignorant, and that at just the time when in China it was the natural thing to have every important literary work printed. There is no question that the Chinese who were associated in the work of translation would have suggested that the translations and the pictures should be brought before the public in what to them was the usual and natural way. Whether the missionaries agreed and thus became the first European patrons of the art of printing, we have no means of knowing. That religious image prints, prepared, like the pictures of John of Monte-Corvino, "for the ignorant," began to appear in Europe some time within the half century after these early missionaries laid down their work, may not be altogether a coincidence.[18]

European Merchants and Travellers

As mentioned above, a Russian seal cutter, a Paris goldsmith and a number of other Europeans were already in the middle of

the thirteenth century at the court of the Great Khan in Mongolia. Marco Polo tells of a German who assisted Kublai's generals in the preparation of engines of war. But it was during the first half of the fourteenth century, after Marco Polo's reports of Cathay's wealth, that trade between Europe and China multiplied.[19] The extent of that trade can best be understood by a study of the zeal with which Columbus and his successors more than a century later were ready to brave untold hardships to rediscover the wealth of the "Indies" and find the North-west Passage to Cathay. The traders of Mongol times were not men of letters and there are only a few data, largely furnished by missionaries, from which to form a picture of this early commerce. Andrew, bishop of Zayton in Fukien, wrote in 1326, quoting the opinion of Genoese merchants at that port about exchanges. Odoric, missionary in China from 1323 to 1327, referred for confirmation of the wonders he related about Kinsay (Hangchow) to the many persons whom he had met at Venice since his return who had themselves been witnesses of these marvels. Marignolli, writing after his return from China in 1346, told of the *fondaco* or "factories" he found attached to the convents at Zayton for the accommodation of Christian merchants. But perhaps the best indication of the extent of European trade with China at this time is contained in a handbook prepared by Pegolotti in Florence in 1340. This book, which is a trade guide to the various ports of the world, devotes its first two chapters to Cathay, giving such information as a European merchant travelling in that country would need to know—about routes of travel, about imports and exports, about currency, weights and measures, taxes and duties, etc. Like Marco Polo, the writer of this book describes Chinese paper money, even giving particulars about rates of exchange, but—like Marco Polo again—what interests the writer is not the printing but the value of the paper money.

There is no record to show that printing was brought from China to the West in the wake of trade, nor is it likely that merchants would have come as closely in contact with Chinese printing as would missionaries and translators. Yet the very fact that, during

the half century before block printing appeared in Europe, large numbers of obscure men whose names have not been recorded in history were moving back and forth between China and Europe both by land and by sea, is not without significance. In a later period, when the way to Cathay had been rediscovered by Vasco de Gama, and trade had been reëstablished—some half century or more after Gutenberg—a Chinese printed book found its way very quickly to Portugal and was presented by the king of Portugal to the Pope.[20] It is not an unlikely hypothesis that a specimen of Chinese printing or a report of Chinese printing, brought to Europe during the earlier period when trade was more extensive, was one of the influences back of the great block printing activity that preceded the invention of type.

The Mongols in Persia

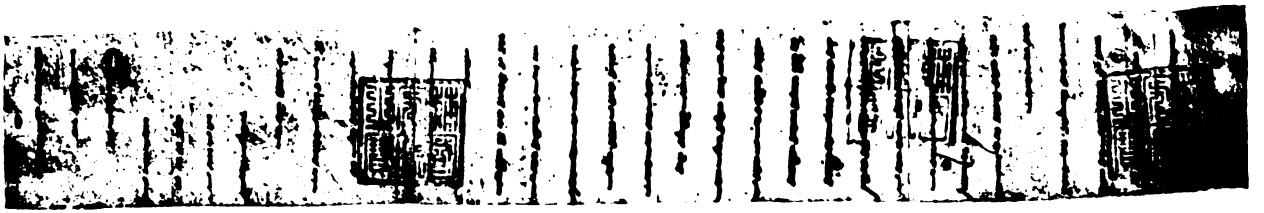
The one point at which Europe and the Far East came together and mingled most fully was Persia. The significance in the history of printing of the interchange of ideas between East and West that took place in Persia, and especially in the great cosmopolitan center of Tabriz during the enlightened reign of Ghazan Khan and under other Mongol rulers, is so great that a special chapter must be devoted to this natural crossroads between the East and the West.

CHAPTER XVII

PERSIA THE CROSSROADS BETWEEN THE EAST AND THE WEST

FROM the days of Mohammed until the time of the Mongol conquests, the world of Europe and Asia was divided into three very distinct cultural areas—Christendom in the West, Islam in the center, and the Buddhist and Confucian domain in the East. In Persia during the Mongol régime the three for a time seemed almost to coalesce. Under the tolerant rule of the Ilkhans, Buddhist and Moslem, Christian and Jew succeeded each other in the highest positions of the state with surprising swiftness, while all races of the known world mingled in Tabriz, the cosmopolitan capital.

Persia was first overrun by Jinghis in 1221, and in 1231 brought fully under Mongol domination. In 1258 Bagdad was taken by the great Mongol general, Hulagu, brother of Kublai, and Mesopotamia with much of Syria and Armenia was added to the Mongol domain. This brought the Mongol armies face to face with the Crusaders. Certain of the Mongol allies even proceeded as far as Palestine and sacked Bethlehem, the Crusaders' chief shrine. But as a rule the Mongol Ilkhans (as Hulagu and his successors were called) were more or less allied with the Crusaders against their common enemy, the Saracens. Constant embassies were exchanged between Tabriz, the Mongol capital of Persia, and the later Crusading princes. In the letters that have been preserved, the Mongols with true diplomatic courtesy express their deep attachment to the Christian faith, and the replies of the Crusaders greet them as Christian brothers, as do also letters from James of Aragon and Edward II. of England. A number of embassies were even sent to Europe by the Mongol rulers of Persia, bearing letters to the Pope, to the king of France and to the king of England,



LETTERS FROM THE MONGOL RULERS OF PERSIA TO PHILIP THE FAIR OF FRANCE

The first letter, dated, 1289 is from the Ilkhan Argon, agreeing to join the Crusaders the next year and encamp before Damascus, and agreeing, if Jerusalem should be taken by their combined efforts, to turn over the city to the King of France. The second letter, dated May, 1305, which is nearly ten feet long, is from the Ilkhan Uljaitu. It announces the reunion of the Mongol dominions, and introduces to the King of France two ambassadors. Both letters are in the Mongol language and in Uigur script. The seals are in Chinese
(First letter 183 x 25 cm. Second letter 300 x 50 cm.)

Yule's Marco Polo. Cordier Edition.

and several such letters with their large vermillion seal impressions in Chinese characters are still preserved. One of these letters written in 1305 by the Mongol ruler of Persia and now in the Paris archives, is nine feet long by eighteen inches wide and contains as many as five impressions of the Great Seal which the Ilkhan had received from his overlord in Peking.[1] These various Chinese seal impressions which were impressed on letters from Mongol rulers, and which as a rule were nearly six inches square, were perhaps the nearest approach to block printing that Europe had yet seen.[2]

In matters of religion the Mongols were always chameleons—taking their color from their surroundings. The extent of their contact with the Crusaders is indicated by certain phrases and expressions that they used. There is a letter from the Ilkhan Argon in which the Chinese date (the year of the Cock) is followed by the phrase, "In Christi nomen, Amen." The coins of the earlier Ilkhans are inscribed, "In the name of the Father, Son and Holy Ghost," and curiously enough the first Moslem Ilkhan, Ahmed Tigudar, kept the same inscription.[3]

Nestorian Christians, especially those of Uigur race, were especially active in bringing about this close relationship between the Mongols of Persia and the princes of Christendom. One such Uigur Christian, Rabban Marcos, born near Peking, was appointed in 1281 patriarch-general of the Nestorian Church with Bagdad as his place of residence. His close friend, Rabban Çauma, another Christian of Uigur race from Peking, was entrusted by the Ilkhan Argon with an important mission to Europe, where as Mongol envoy he visited the Constantinople emperor, the Pope, the king of France and the king of England.[4]

The conquest of Bagdad by Hulagu took place at just the same time that the capital of the Mongol Empire under Hulagu's brother, Kublai, was being moved to Peking and the Imperial court was becoming altogether Chinese. Chinese influences soon made themselves strongly felt in Hulagu's dominions. A Chinese general was made the first governor of Bagdad,[5] and Chinese engineers were employed to improve the irrigation of the Tigris-

Euphrates basin. The Chinese quarter in Tabriz became an important section of this new capital of the Mongol domain.

With the fall of Bagdad, Tabriz soon took its place as the leading commercial center of Western Asia, and so remained during the latter part of the period of the Crusades. Rashid-eddin, a resident of Tabriz at the time, thus describes the city, "There were gathered there, under the eyes of the *padishah* of Islam, philosophers, astronomers, scholars, historians, of all religions, of all sects, people of Cathay, of Machin (South China), of India, of Kashmir, of Tibet, of the Uigur and other Turkish nations, Arabs and Franks."[6] Friar Odoric, who visited his fellow Franciscans there in 1318, described the place as "a nobler city, and better for merchandise, than any which at this day existeth in the world."[7]

The first mention of a European settlement at Tabriz is in 1264, when the Venetian, Pietro Viglioni, died there. With the beginning of the next century trade relations increased rapidly. There were treaties in 1305 and 1320 between Venice and the court of Tabriz, and the latter treaty gave to Venetians elaborate privileges with regard to residence and trade. By 1324 Venice had formed the practice of keeping a consul regularly at the Persian court,[8] and Genoa soon followed her rival's example. By 1241 the Genoese community at Tabriz was presided over by a council of twenty-four members headed by the consul. Not only were the Italian republics thus represented—embassies frequently arrived from other European states also, including France, England, Aragon and the Papacy.

Tabriz is the only place in the Islamic world where there is a clear record of early block printing.[9] In the year 1294 at this Mongol capital of Persia there was an issue of paper money with text in Chinese and Arabic. The treasury had been exhausted by the extravagance of Khaikhatu Khan, and the paper money was issued at the suggestion of a financial officer named Izzudin Muzzaffar. The notes, which ranged in value from half a *dirham* to ten *dinars*, were direct copies of Kublai's, even the Chinese characters being imitated as part of the device upon them. The Chi-

these word *ch'ao* was applied to them.[10] Extensive preparations were made for the project, offices called *ch'ao-khanahs* were erected in the principal cities of the provinces, and a numerous staff appointed to carry out the details. There was an Arabic inscription on each note to the effect that the notes were issued in the year 693 of the Mohammedan era (A.D. 1294),[11] that all who issued false notes should be summarily punished, and that "when these auspicious notes were put in circulation, poverty would vanish, provisions become cheap, and rich and poor be equal." The prophesy was not fulfilled. After the constrained use of the new *ch'ao* for two or three days, Tabriz was in an uproar; the markets were closed; Izzudin, the minister who had proposed the issue, became the object of intense hatred, and according to some accounts was murdered; and the whole project had to be abandoned.[12]

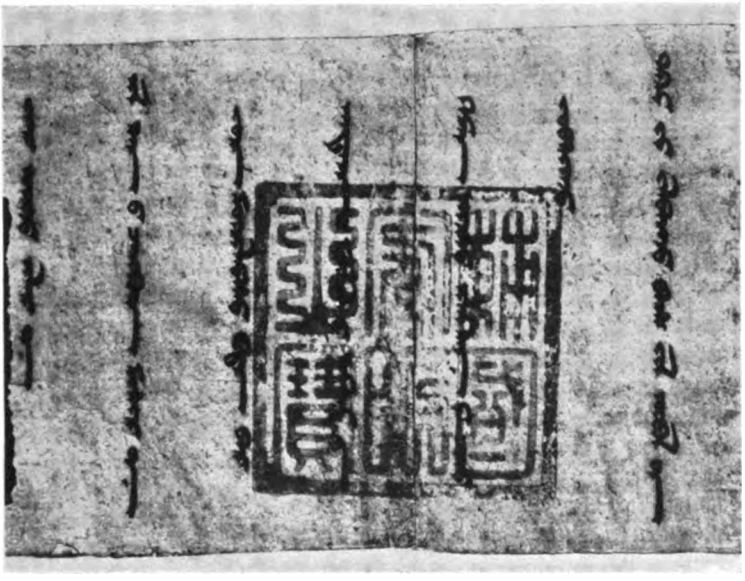
This dramatic issue of a printing project a century and a half before Gutenberg in a great cosmopolitan community near the confines of Europe could not have gone unobserved in the commercial republics of Italy. It did not encourage any European issue of paper money,[13] but it did bring bits of printed paper rather vividly to the attention of a large number of Europeans. Without doubt it brought some of these printed notes as curiosities to Italy—valueless as money, but very valuable to civilization if they got into the hands of some one of an inventive turn of mind. Furthermore this issue of paper money indicated that there were artisans at hand in Tabriz who knew how to print. It seems not unlikely that other forms of printing were going on in the Chinese quarter of this cosmopolitan city, which formed the natural meeting ground of Europe and Asia, and perhaps not only in the Chinese quarter. What these forms were is at least suggested by the block prints of this period that have been found in Egypt and that are described in the next chapter, and by what is known of the history of playing cards.

In the year 1295, just one year after the ill-fated issue of paper money at Tabriz, Ghazan Khan,[14] the greatest of the Mongol rul-

ers of Persia, came to the throne and had his court in that city. Under him the cosmopolitan character of the Persian dominion reached its highest point. He threw off his allegiance (which had already become nominal) to the court at Peking, and declared Mohammedanism the official religion of his empire. Yet by yearly embassies he maintained close relations with the Chinese court, and his relations with certain Christian princes in Europe were equally close. Ghazan was himself a man of broad education, and is said to have been able to read eight languages, including Chinese, Uigur, Arabic and Latin.

Soon after coming to the throne, Ghazan called as his prime minister Rashid-eddin, and entrusted to him the preparation of a history of the Mongol Empire, which was followed later by a history of the world,[15] the first history so far as known that ever attempted to bring within the limits of one work the records of China, of the Near East and of Europe. The world history begins, as is natural, with the Creation, and gives a vivid description hour by hour of the work accomplished by the Creator on Thursday of Creation week, in order that he might be ready to rest on the Moslem Sabbath. Turning to Europe, the book tells among other things of the contemporary wars that were going on between England and Scotland, and gives the information that even at that time there were no snakes in Ireland. But the part of Rashid's work that touches our subject is the section on China. For there, embedded in a short sketch of Chinese history, is the following clear description of Chinese block printing. Having described the care with which the Chinese transcribe historical and other passages from their ancient books, he says:

"Then, according to a custom which they have, they were wont and still continue to make copies from that book in such wise that no change or alteration can find its way into the text. And therefore when they desire that any book containing matter of value to them should be well written and should remain correct, authentic and unaltered, they order a skilful calligraphist to copy a page of that book on a tablet in a fair hand. Then all the men of



REPRODUCTION OF ONE OF THE RED SEAL IMPRESSIONS FROM THE FOREGOING LETTER OF 1289, TO THE KING OF FRANCE

The Seal of State, in Chinese characters, from which this impression was made was sent from Peking to the ruler of Persia with much ceremony by the Great Khan Kublai. The impression is nearly six inches square

Yule's Marco Polo. Cordier Edition.

RUINS OF THE GREAT MOSQUE OF TABRIZ

Built during the reign of Ghazan Khan and under the direction of the historian Rashid-eddin.

Yule's Marco Polo. Cordier Edition.

learning carefully correct it, and inscribe their names on the back of the tablet. Then skilled and expert engravers are ordered to cut out the letters. And when they have thus taken a copy of all the pages of the book, numbering all (the blocks) consecutively, they place these tablets in sealed bags, like the dies in a mint, and entrust them to reliable persons appointed for this purpose, keeping them securely in offices specially set apart to this end on which they set a particular and definite seal. Then when anyone wants a copy of this book he goes before this committee and pays the dues and charges fixed by the Government. Then they bring out these tablets, impose them on leaves of paper like the dies used in minting gold, and deliver the sheets to him. Thus it is impossible that there should be any addition or omission in any of their books, on which, therefore, they place complete reliance; and thus is the transmission of their histories effected." [16]

This is the earliest notice of Chinese printing, aside from the making of paper money, outside of Chinese sources. It is evident that Rashid had a reasonably reliable source of information and that the printing in which he was interested was the printing of books, especially historical records. Where he failed was in not grasping the importance of the new art as an economical means of disseminating literature, and in seeing in it merely a means of authenticating the exact text—a characteristic of Chinese official printing that has already been noted, but which Rashid without doubt overemphasized and exaggerated. In spite of this overemphasis, Rashid's description could not have failed to spread abroad the idea that books could be produced otherwise than by hand labor. For Rashid's history was a widely read book. Many copies were transcribed, both in Arabic and Persian, and deposited in the libraries of mosques throughout the Moslem domain,[17] and at least twenty-six early manuscripts are still preserved, in Persia, in India and in the libraries of Europe.[18] Furthermore, Rashid's description seven years after it appeared was incorporated in another and still fuller world history, the so-called *Garden of the Intelligent* by Banakáti, a history which carried cosmopolitanism

and breadth of view even farther than that of Rashid.[19] The world of Islam, even if it refused to print books, was not altogether unacquainted with the printing of China. It is not without significance that the paper money of 1294, Rashid's description, and Banakáti's history all were issued from Tabriz during the quarter century when that city's commercial prosperity and cosmopolitan character were at their height.

In this and the preceding chapter there are suggested some of the points at which China and Europe met across the Mongol Empire—points at which Europe was exposed to the block printing activity of China and Central Asia. During the middle decades of the fourteenth century, the Mongol power in Persia, in China and in Central Asia disintegrated, and, some time within the next half century after that collapse of Mongol power, block printing made its appearance in Europe. No positive documentary evidence has yet been found to show that block printing entered Europe by any of the routes here described, or that European block printing came from the Far East at all. But strong circumstantial evidence leads to the conviction that either through Russia, through Europeans in China, through Persia, or through Egypt (see chapter eighteen)—perhaps through several or all of these routes—the influence of the block printing of China entered the European world during the time of the Mongol Empire and the years immediately following, and had its part in bringing about the rise and gradual development of that activity which in turn paved the way for Gutenberg's invention.

CHAPTER XVIII

BLOCK PRINTING IN EGYPT DURING THE PERIOD OF THE CRUSADES

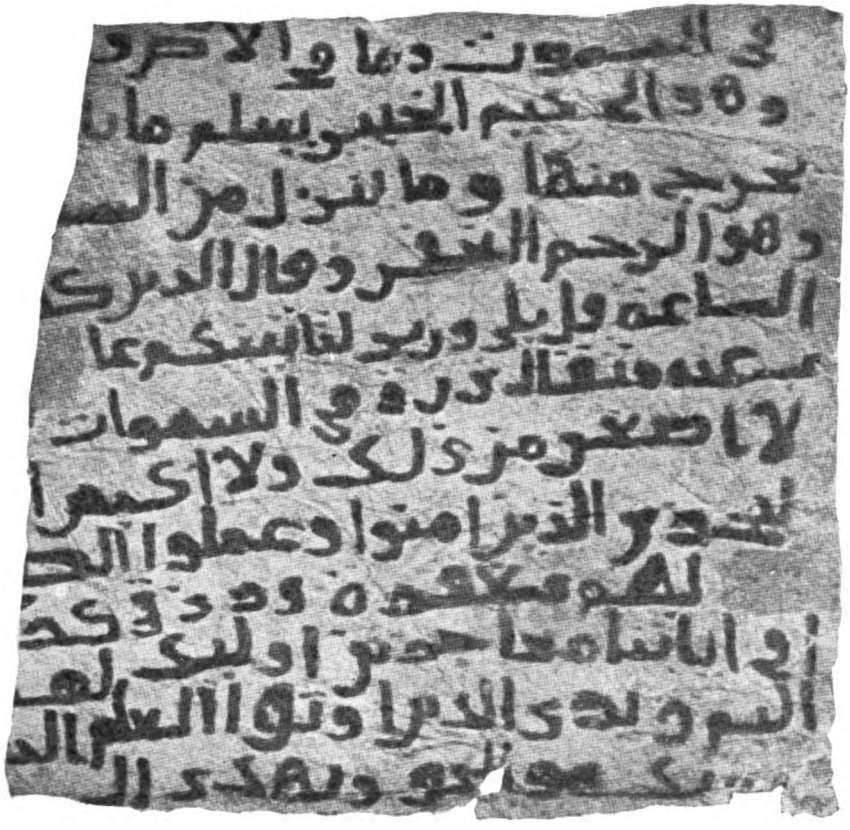
WERE it not for one archaeological discovery, it might be thought that the Arab prejudice against printing had completely gained the day. The fact that no books were printed in Islamic countries down almost to our own time might be held as sufficient evidence that the only instance of early printing in the Moslem world was the unfortunate issue of paper money at Tabriz. Against this view stand some fifty bits of printed paper. About the year 1880 excavations in the region of El-Fayyûm in Egypt, near the ruins of the ancient city of Crocodilopolis or Arsinoë, brought to light great masses of documents. Whether they belonged to refuse heaps or to archives of an earlier age does not seem to be altogether clear. From this find more than a hundred thousand sheets and fragments of papyrus, parchment and paper have been brought to Vienna and now constitute the Archduke Rainer Collection in the Austrian National Library. They are in ten different languages and their dates range from the fourteenth century, B.C., to the fourteenth century, A.D.—a continuous stretch of about twenty-seven hundred years. The importance of this collection in the history of paper manufacture is well known to the scientific world. The fact that the collection contains some fifty fragments of block printing and that these fragments form almost the only evidence of the printer's art between China and Central Asia on the one hand and Europe on the other seems largely to have escaped attention.[1]

These printed fragments show endless variety. In size they range from tiny bits up to pieces nearly a foot long and as wide as a column of newspaper. Some are beautifully printed, with perfect alignment and graceful ornamentation; others show the crud-

est workmanship. Some are on rough paper, others on fine. On some the printing is black on white; on others white on black; one is printed in red ink. But most important of all from the historian's point of view, is the variety in the form of the Arabic letters. Here scarcely any two of the fragments are alike. It is from this that the skilled Arabist can set the approximate date. Judged by this standard, the block prints range all the way from 900 to 1350.[2]

With all their variety there are certain particulars in which the fragments are alike. They consist entirely of text and simple geometric ornamentation, conforming thus to the Mohammedan (Sunnite) prohibition against pictures. On the other hand their appearance immediately suggests the printing of China and Turfan. There is every evidence that they are printed not by pressure, but by being laid on the block and rubbed with a brush or pad in the Chinese fashion. The language is always Arabic, though there is one Arabic prayer, around the edge of which in the form of a border is printed a transliteration in the Coptic alphabet.

In subject matter the fragments are also similar in that they are all religious. Some are prayers, some are texts from the Koran and some contain special protective charms. One consists of the so-called hundred beautiful names of God. The oldest fragment [3] is about four inches square and contains verses 1–6 of the 34th Sûre of the Koran, reading as follows: "In the name of God the all-merciful. Praise be to God, to whom belongeth all that is in heaven and on earth. The last hour will not bring us to nought. Speak, Verily as the Lord liveth, the hour will come to you. To Him who knoweth all secrets, to Him who knoweth all secrets, to Him is nothing hid, in heaven or upon earth, even if it be so small as an ant. Be it smaller or be it larger, it is yet written in the certain book of judgment, that he may reward them that believe and deal righteously. But they who seek to weaken our tokens, they shall be punished with grievous punishment. They to whom knowledge is given see well that that which is revealed by the Lord is truth and leads to the way of glory and of praise."



THE OLDEST OF THE EGYPTIAN BLOCK PRINTS

Found at Ushmûnein, near el-Fayûm. A tentative date of early tenth century has been assigned by Arabists on epigraphic grounds. Contains the 34th *Sûre* of the Koran, vs. 1–6
(10.5 x 11 cm.)

There is one large and well printed piece [4] that contains a section of the Koran and with it, as a very potent charm, the letter that Mohammed is supposed to have dictated to Abû Dudshâna after that worthy had rubbed against Satan in the dark and found him covered with porcupine quills. It ends, "Protect the possessor of my letter from the influence of the evil eye and from the evil look." Accompanying this charm against the evil eye is the following conversation between the Talismanic Power and the owner of the charm:

(Talismanic Power): Come nigh and fear not, for thou art safe.
(Owner): Save me from (blank to be filled out by owner in writing).
(T. P.): When thou shalt read aloud from the Koran, we shall cause a thick veil to hang between thee and them who believe not in the eternal life.
(O.): Our Savior is God. Full of bounty is God. Full of forgiveness is God. He is the best protector and the best helper.
(T. P.): I have met and killed him who thought to bring upon thee destruction and evil.
(O.): I place my trust in God, for God looks upon his servants.

How are we to account for this printing that apparently was going on for a very considerable time under a culture that has always been known for its hostility to printing—under a religion which in 1727 declared by its highest authority that it was against the religion and honor of Islam to allow the printing of the Koran? On the one hand no books printed, no reference in literature to Arabic printing, and a settled hostility to printing when it tried later to enter from Europe. On the other hand some fifty scraps of printed paper, Arabic in language and Mohammedan in content, many of them passages from the Koran, found in the heart of Egypt, presenting great variety of form and extending from a time that was probably soon after the earliest printing in Central Asia up almost to the beginning of block printing in Europe. The phenomenon is not very different from that which occurred in

China before 953. There an obscure religious printing, deep down among the people, spread over much of China and into Japan with scarcely a mention in literature. But for the later development of the art in China, that early Buddhist printing would have been utterly forgotten till brought to light by excavations in the Turkestan desert. And again history repeated itself in Europe. Those early rough image prints, now so carefully treasured as the tentative beginnings of the impulse to print, would never have been heard of, if there had been no further development of printing. The early block printing of Tun-huang, of Egypt and of Nuremberg are in their essence the same. The language is different and the religion is 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 have supernatural power, but which he could not himself write or paint and could not afford to buy unless duplicated for him by some less laborious process. In China, in Egypt and in Europe printing was the same in its beginnings. But China had its Fêng Tao. Europe had its Gutenberg. Egypt had neither. In China and in Europe printing profoundly affected civilizations. In Egypt—owing probably to a peculiar prejudice of the learned—it remained, as it had begun, an obscure art.

It is possible that the analogy may be carried one step further. Chinese printing during the period of its obscurity met such a need of the common people that it spread through a considerable area in China, Japan and Central Asia. In the same way the block printing of pre-Gutenberg days spread through much of Central Europe. It is not impossible that there has been preserved in Egypt on account of the dryness of the desert all that remains of a more wide-spread block printing activity that extended through other parts of the Islamic world. This can only be offered as a possibility. Later discoveries may or may not show it to be true.

As to the origin of Egyptian block printing, it is not well to be too dogmatic. That it is connected with the printing of China and Central Asia rather than a natural development from textile print-

ing is the general view of such men as Karabacek and Grohmann who have made a study of the prints, and has not been disputed. This view cannot yet be regarded as absolutely proved, but it is the theory that fits best with such facts as are so far known, and is the natural conclusion to be drawn from the technique, from the religious subject matter and from the materials used.[5]

As to the date of the transference of the new art from China, there is considerable difficulty. Arabists are inclined to place the date early, somewhere about 900, on account of the script of two or three of the prints, notably the one here illustrated. At that time block printing was in its very beginnings in China, and probably it had not yet spread even to Central Asia. Such a date is possible, but a date later in the century, after the printing of the Classics and the Buddhist Canon, and after printing had started across Turkestan, in many ways seems more reasonable. Yet there is the objection that through the Sung Dynasty communication between China and the Near East was less frequent than it had been in the previous period. Another possible view might be that the printing of charms and sacred texts—like so many other things—moved into the Islamic world through Persia during the Mongol period, and that the few prints which exhibit script of an earlier period had their blocks cut from manuscripts that were already ancient. There are difficulties with each of the various views as to date. The best that can be said is that the Egyptian block prints date from somewhere between 900 and 1350, and that many, if not all, date from the latter part of this period.

The question of route by which block printing may have travelled is closely bound up with that of date. If the date is early, the route may have been by sea direct from China or it may have been overland and connected in some way with the movement of great bodies of Turks from Central Asia to Mesopotamia and Egypt.[6] If the date be put as late as the Mongol period, Persia must almost certainly have been the route, and in that case there was probably a block printing activity in Persia even

more important than that of Egypt, but of which on account of the climate no traces have yet been preserved.

The dates of the block printing of Egypt cover at least a part of the period of the Crusades and of the trade activities that sprang up in the wake of the Crusades, the time when pious souls and enterprising souls from Europe visited the Moslem East as never before. As the Egyptian prints came to an end, the block prints of Europe began. Texts from the Koran gave way to texts from the Bible; and, in accordance with Christian tradition and the unlettered condition of those who bought them, pictures appeared. What connection, if any, existed between the charms and Koran texts of Egypt and the image prints of Europe, is a matter for further investigation.

CHAPTER XIX

PLAYING CARDS AS A FACTOR IN THE WESTWARD MOVEMENT OF PRINTING

INASMUCH as one of the first forms of block printing known in Europe—perhaps the very first form of printing on paper—was the making of playing cards, a study of the origin of cards may throw some light on the question of the origin of European block printing.

A large amount of research must be done in Chinese sources and comparison made with the history of other games in Arabic and Indian sources, before a record can be written with anything like completeness or accuracy of the pre-European history of playing cards. A few facts have however been ascertained and a few conclusions may be more or less tentatively stated.

Cards belong to the group of games that had spread over a considerable part of Asia before the Crusades. From such preliminary study as has so far been done, it would seem that the currents had passed in a number of different directions. Dice, known in Egypt from remote times, spread throughout the Roman Empire, and entered China early in the Christian era. Backgammon [1] and chess [2] probably originated in India and entered China, with other Indian influences, either during the T'ang Dynasty (618–907) or a little before. Polo spread from Persia to India and China about the same time, and is easier to trace than other games, because it goes by the same name, *pulu* or *polo*, with only slight modifications, in the various countries where it has been played.[3] The confusion of names and the use of the same name for several games, makes the tracing of chess, cards and dice very difficult, especially in Chinese sources.

The earliest reference in China to dice, which form the background of Chinese playing cards, is in the year 501, and records

the tradition that "Lao-tzŭ brought back the game when he returned from the region of the Western Barbarians."[4] We have here a feeling that the game was already ancient, that it had been introduced from the West, and that it was connected in some way with divination or magic—Lao-tzŭ's name having by this time gained that peculiar association.

There is little doubt that both playing cards and dominoes originated in China and that both games had dice as their background, influenced also perhaps by certain forms of divination and the drawing of lots and possibly by paper money. There are certain indications that the transition from dice to cards took place at about the same time as the transition from manuscript rolls to paged books. As the advent of printing made it more convenient to produce and use books in the form of pages, so it was easier to produce dice in the form of cards. These "sheet-dice," as they were called, began to appear, according to the Tz'ŭ-yüan Encyclopedia, before the end of the T'ang Dynasty,[5] and if this is true, they were one of the earliest forms of block printing in China, as they were later in the West.

With the Sung Dynasty (960–1280) it seems probable that the evolution of these "sheet-dice" took two forms. Some continued to be printed on cards, and these grew more complicated, developing various picture forms and conventional designs—the ancestors of both Chinese and European playing cards. Others came to be made on bone or ivory, and as these were more difficult to produce, they remained for some time relatively simple (dominoes), but later these also developed more complicated forms, one of which has come to the Western world under the name of Mah Jongg.

The statement of Abel Rémusat, repeated in the Encyclopedia Britannica and other authorities, that "cards were invented in the reign of the emperor Hsüan Ho in 1120,"[6] needs considerable modification. In the first place such games as cards are not invented—they grow. In the second place there is a passage in the Liao annals that carries playing cards with almost entire certainty

back to the year 969.[7] And in the third place the very authority that Rémusat quotes, the Cheng-tzŭ-t'ung dictionary, adds the note, "It does not follow that this class of games originated in the *Hsüan-ho* period." It is true however that at about this time—the time of the removal of the capital to Hangchow, early in the twelfth century—begin the first clear and detailed references to card playing, references which cannot possibly be confused with chess or dice, and which show a widespread and highly developed game of cards that continued throughout the Southern Sung and Mongol periods.

Our next sources for the history of playing cards are European. In all mediaeval Arabic literature they are, so far as known, never mentioned.[8] Nor is archeology of very much aid, for though two Chinese playing cards—presumably ancient—were turned up by the German expedition near Turfan, there is no material by which they can be dated with certainty. For further clues it is necessary to turn to Europe.

Here again in the early records there is confusion of terms. Chess, which had spread from India through the Saracen world, had reached Europe with the first Crusades [9] or even earlier, and had been played for two or three centuries before cards began to appear. The Arabic or Persian origin of the European game of chess is clearly indicated in the use of such words as 'check' (*shah*, king) and 'mate' (*mat*, dead).[10] Certain supposed early references to cards in Europe, during the thirteenth century and the early part of the fourteenth, are now generally conceded to refer to chess rather than to cards.[11]

The earliest references to playing cards in Europe that can be clearly differentiated from chess, follow each other with rapid succession in various countries—Germany 1377,[12] Spain 1377,[13] Luxemburg 1379,[14] Italy 1379,[15] France 1392.[16] By 1397 card playing had become so popular in Paris as to occasion an edict by the provost of the city, in which workingmen were forbidden to play cards and certain other games on working days. In 1404 the Synod of Langres forbade the clergy to play cards. A climax was

reached in 1423, when a famous sermon against card playing was preached by St. Bernard of Sienna from the steps of St. Peter's at Rome, with the result that his hearers rushed to their houses, brought such cards as they possessed to the public square and burned them.

A comparison of the dates of the spread of playing cards with the dates of the earliest religious block printing is significant. The most generally received view is that the earliest religious block prints date from the last decades of the fourteenth century. The earliest *dated* print, which shows a more advanced stage of the art, the St. Christopher of 1423, coincides with St. Bernard's sermon against card-playing. The period during which playing cards spread through Europe corresponded therefore exactly with the period of the earliest religious prints. It corresponded also with the half century after the collapse of the Mongol Empire.

The question how early the playing cards of Europe began to be *printed* has been much debated.[17] The consensus of opinion is that very early in the fifteenth century or even before 1400, and possibly from the time of their first use in Europe, at least some of the cards were printed. The printing of cards soon came to be an important industry. An edict of the Council of Venice, dated 1441, indicates that the card printing industry, which before that time had flourished in Venice, was already being interfered with by outside competition.[18] Card makers, who were presumably card printers, had already between 1418 and 1438 been mentioned five times in the city records of Augsburg and Nuremberg, and at about the same time the records of the city of Ulm in Germany show that cards were being shipped in barrels to Sicily and Italy. By some the first printing of playing cards is believed to have preceded the making of image prints, but it seems more probable that the two forms of printing developed side by side at about the same time, and that they were sometimes carried on by the same persons.[19]

In determining the source of European playing cards, the student is faced with a paradox. With the exception of a seventeenth

AN OLD CHINESE PLAYING CARD

Found near Turfan. Date uncertain, but probably about 1400 (9.5 x 3.5 cm.)

Museum für Völkerkunde.

century writer who claims that cards were introduced directly from China to Italy,[20] European sources are unanimous in indicating that the game was derived from the "Saracens."[21] On the other hand Arabic sources, so far as has yet been discovered, never mention the game. From them it would seem as if the injunctions in the Koran against games of chance were obeyed to the letter. To solve this apparent paradox, it is necessary to understand the historical situation. Card playing had been general in China for at least two centuries before it was known in Europe. Presumably cards were in common use in the Mongol armies and among their camp followers. Chinese, Central Asiatics of various sorts, Moslems, Genoese and Venetians were living and trading together for a century or more in Persia. Immediately thereafter cards spread through Europe from the "land of the Saracens." But card playing had not, like chess, made itself sufficiently at home in the Islamic world to enter into Arabic literature. The game passed quickly and lightly across the Near East without leaving any trace in Arabic records. There was no repetition of paper's laborious course of a thousand years from China to Europe, for the things that Europe had real demand for—such things as gunpowder and playing cards—it got quickly! Furthermore, the Mongol conquests and the Crusades had intervened.

Of the connection between the introduction of playing cards from China through the Islamic world to Europe and the transmission of block printing there is no certain proof. The cards of China were of course printed. It is difficult to imagine the colonies of Chinese and Central Asiatic merchants who settled in Tabriz not bringing their games and their gaming habits with them, as Chinese have always done in those countries to which they have gone in more modern times. It is easy to speculate farther, to think of Chinese block cutters (perhaps the same men who made the ill-fated paper money of Tabriz) setting to work to make cards and thus avoid the long and expensive import across the deserts, and gradually adapting those cards more and more to the language and customs of the land in which they lived. It is certainly not

difficult to imagine the joy with which Venetian merchants and perhaps some of the later Crusaders hailed this new-found game and brought it back with them to Europe. And it is not likely that the cheap and simple way in which the cards were made and duplicated would have escaped them.

But all this is conjecture. What is known with certainty is that printed playing cards were in common use in China before the Mongol conquest; that immediately after the Mongol period cards began to appear in Europe and were recognized as of Eastern origin; that, either from the first or soon after, these cards were printed; that playing cards were among the first, if not altogether the first, block prints in Europe; and that the printing of cards constituted an important industry both in Venice and in southern Germany in the early part of the fifteenth century. While it is not safe to say with certainty that playing cards in coming from China to Europe brought block printing with them, the evidence is at least sufficient to suggest that among the possible ways by which block printing may have entered the European world, the use of playing cards holds an important place.

CHAPTER XX

THE PRINTING OF TEXTILES

THE beginning of block printing in Europe was undoubtedly the result of many influences. In the preceding chapters there have been traced certain influences that seem to have come into Europe from the East, and especially from the Far East; but there were other influences at work whose connection with the Orient is less obvious. Foremost among these is that of the printing of textiles.

Wherever textiles have been used, and wherever man—or woman—has been pleased to have clothing decorated with patterns, there has been a tendency to produce these patterns by mechanical labor-saving devices. Certain of these devices have involved the transfer of the pattern by the use of wooden blocks in a manner that suggests early block printing on paper, and textiles whose patterns have been thus produced are generally known as prints.

While many materials have been used for the making of prints, cotton has in general been the most satisfactory, especially for the various dye processes used in India and the Near East. It seems reasonable to suppose that India, the home of cotton, was also the first country where many of those processes were born that led the way to textile printing. The very advanced technique of the earliest Indian textile prints that have come down to us tends to confirm this hypothesis.[1]

The Indian methods of textile printing, and the methods which spread through Asia and into Egypt, differ somewhat from the method that grew up in Europe during the time of the later Crusades. The Oriental methods were far more complex and varied. While the early European textile printer actually impressed pigment on his fabric directly from the block, with the help of such vehicles as oil, resin or albumin, and by so doing failed to allow

the color to penetrate the fibre, the textile printer of the Orient had learned the secret of allowing the dye fully to penetrate. This latter process was ingenious, and required some empirical knowledge of chemistry. What he impressed on the material by means of a block was generally not pigment—it was either a resist or a mordant. If he used a resist—some substance like wax that resisted the action of dye—the printed portions were kept white when the fabric was later dipped in the dye vat. If he impressed on his fabric a mordant—a substance that was capable of uniting chemically with the dye and holding it fast—and if the fabric printed with mordant was then dipped in the dye vat, only the mordanted portions took the dye and held it, while from the rest of the fabric the dye could be rinsed out.

Still a third process, known as negative printing, has been found in Japan, and there are indications that some at least of the printed fabrics found in Central Asia were also produced by this method. The block is laid on the fabric dry, with another block, a perfectly smooth one, beneath. The two blocks with the fabric between are then locked together tightly in a vise. The upper block has been so prepared that liquid color may be inserted through holes in the back and may penetrate to the incised surfaces. When the two blocks are held together firmly with the fabric between, the color is applied through these holes and remains long enough to penetrate the fabric thoroughly. It is then poured off, and after a time, when the blocks are removed, the pattern of the fabric is found to correspond with the incised portion of the block.[2] The process of negative printing could be used at will, either for impressing dye-stuff directly on the fabric or for using resist or mordant.

Though there is a statement in the writings of Pliny which indicates the probability of some sort of resist printing in Egypt in Roman times,[3] the earliest prints that have come down to us seem to date from about the sixth century. These are resist prints on cotton, and have been found in Egypt. With them there was found a print-maker's wooden block from the same period.[4] The

oldest printed fabric found in Europe comes from Arles in southern France, from the tomb of St. Caesarius, who was Bishop of Arles from 502 to 543. Another textile print, found at Quedlinburg in Germany, which is believed to be from the seventh century, shows a fairly advanced technique, as it contains three colors, among them gold. Both of these European prints were apparently produced by the Oriental process, and judging from the designs, and also from the material, it seems likely that they were imported from the Near East.[5]

The earliest clearly dated prints have come from Japan, and here too we find at an early period a highly developed technique. Among many bits of printed silk that have been preserved in the ancient palace of Nara, and which all date presumably from the Nara period, 712 to 770, are two in which the actual date forms a part of the pattern. The dates of the two pieces are 734 and 740. These dates are the earliest examples in the world of block printed script, and it is not surprising to find that they antedate by only a few years the first block prints on paper from Japan. The designs of these Japanese prints include flowers, willows, butterflies, pheasants and small birds.[6]

The oldest textile prints from China that have been preserved are slightly later than those found in Egypt, Western Europe and Japan; but in the Tun-huang Caves enough printed textiles of the tenth century or earlier were found to indicate that by that time the making of these fabrics was an established industry.[7] It is altogether probable that it had been going on for a considerable time, and that the art as practiced in Japan two centuries earlier had been brought over from the mainland. Among the Turkestan finds also from the region of Turfan, textile prints are not uncommon, but their dating is beset with considerable difficulty. There are indications that these prints of Tun-huang and Turfan were produced by the negative process, and that very likely both mordants and resists were used.

It is a striking fact that textile prints should have made their appearance in such widely separated regions as Western Europe,

Egypt, China and Japan at so nearly the same time. It is too early yet to put forward with confidence any theory of common origin. All that can be said is that in the overland trade across Asia textiles bore a preponderating share, and that in the wake of commerce a textile printing industry with many common features both of ornament and design seems to have spread over much of the country from Europe to the Pacific.

The printing of textiles made little advance in Europe until the thirteenth and fourteenth centuries. When it sprang up anew at this time, it was a different and more primitive form of printing than that which had formerly been brought from the East. Both the prints themselves and a description written by Cennino Cennini at the beginning of the fourteenth century,[8] show that the pigment was impressed directly upon the fabric from a wooden block. According to Cennini, the printer used two blocks (as in Japan), the one above the cloth having the pattern incised, and the one below being plain and smooth. But in the European process the fabric was held firm in a frame, while the two blocks, one in each hand, were pressed together upon it, with the result that the pattern was transferred directly to the fabric from the raised surface of the upper block.

It was during the latter part of the period of the Crusades that prints of the kind described by Cennini began to spread in any number through western Europe. Some prints were produced by this process in the Rhine Valley as early as the twelfth and thirteenth centuries, but in the fourteenth century, at just about the time when the first block prints on paper began to appear, there came a rapid expansion. In the first place, printed textiles began to be produced on a larger scale, and the territory in which they were made widened. In the second place, there was greater variety in design.[9]

Along with these changes and improvements, and along with the growth of block printing on paper, there began to appear a few textile prints where the picture rather than the fabric was the center of interest, prints which were evidently sold not by the

yard or ell, but by the picture. These were the so-called picture prints. They seem to have been made for use as embroidery patterns, though two or three have been found, presumably dating from the end of the fourteenth century and the beginning of the fifteenth, that show a more finished workmanship, more nearly approaching the style of the block prints on paper.[10]

That the printing of textiles, and especially these picture prints, had a part in preparing the way for block printing on paper, there can be no doubt. Whether in Asia or in Europe, textile printing formed a background which made the learning of the new art of paper printing a comparatively simple transition. In Europe in particular the close connection of the textile printer and the early block printer has always been recognized, and rightly so.

On the other hand, it is important to note the distinct differences that have always existed between printing on paper and printing on cloth. Not only are the materials different, paper and ink as opposed to textiles, mordants, resists, and dye; still more important was the complete difference of purpose that showed itself in the choice of objects to print. The printer on textiles printed designs for ornamentation. The early printer on paper printed objects of piety for edification. This is the fundamental distinction to be kept in mind. It is equally true in Japan, in China, in Central Asia, in Egypt and in Europe. Whether picture or text, practically all the earliest block prints on paper that have been preserved are religious.[11] On the other hand, with the exception of a very few of the picture prints mentioned above, none of the textile prints, whether in Asia or Europe, has a religious motive.

While textile printing was one of the influences back of the beginning of block printing in Europe, it was not the only influence. Other strong tendencies were at work, tendencies of a different character, to produce that deeply religious art, so pregnant with possibilities, that sprang up in Europe toward the close of the fourteenth century. What those other influences were will be the subject of the next chapter.[12]

CHAPTER XXI

BLOCK PRINTING IN EUROPE

THE fourteenth century was the early dawn time of the modern world. It is a century that sings with the birdsong of new life. Chaucer sang that new life in England in all its freshness; Dante had given it a richer deeper note in Italy. All over Europe the cathedral builders were reaching their triumph. In Florence and in Flanders art was waking from its thousand years' sleep. In religion the century began with the simplicity and beauty of the early followers of St. Francis. It closed with the deep moral earnestness of Wiclif, Savonorola and Huss. Ecclesiastical religion was in captivity at Avignon; the religion of the spirit was breaking free.

Europe had been to the East in the Crusades and had come back ready for new things. Travel inspired her; the germs of a thousand ideas were suggested to her. But Europe with her newly awakened creative genius did not merely copy. She used rather the impulses that had been suggested to her to rear a structure all her own.

The new movement was a democratic movement. Its poets—Chaucer and Dante—wrote for the first time in the language of the people. The roots of the new life were in the cities; Venice and Florence, Nuremberg and the cities of Flanders were beginning to dispute with the feudal lords their mastery of society.

It was here in certain of these cities, deep down among the people, some time during this century of awakening, that block printing had its birth. Just when or where or how it began no one knows. Its beginnings were as obscure in Europe as they had been in China and in Egypt. From the first, two very distinct lines of development can be traced, the playing card and the image print. As the story of playing cards has already been told in a previous

Der Form ſchneider.

Ich bin ein Formen ſchneider gut/
Als was man mir für reiſſen thut/
Mit der federn auff eitt form bret
Das ſchneid ich denn mit meim geret/
Wenn mans deñ druckt ſo find ſichſcharff
Die Bildnuß/wie ſie der entwarff/
Die ſteht/denn druckt auff dem papyr/
Künſtlich denn auß zuſtreichen ſchier.

AN EARLY EUROPEAN BLOCK CUTTER PREPARING BLOCK FOR A WOODCUT

From woodcut by Jost Amman, 1568

chapter, the discussion here will be largely confined to image prints and their later developments.

The point of departure is a picture of St. Christopher, which bears on its face the clear date of 1423. There is no reason for supposing that this is the oldest of the several hundred image prints that have come down to us, but it is one of the very few that bear dates, and of those few it is the earliest. When the making of such prints actually began is much disputed. Some carry the beginnings of the art back nearly to 1300. Others place the date nearer 1400 or even after the opening of the new century. The weight of evidence seems to favor the latter decades of the fourteenth century as the period when block printing in Europe began.

These image prints have been found in the main in monasteries of southern Germany, though some are of Flemish origin, and from documentary evidence it is clear that Venice was another early center of production.[1] By the time of Gutenberg the making of image prints seems to have spread over most of central Europe.

There are certain marked characteristics that these early prints have in common. They are all religious—rude drawings of scenes from the Bible or from the lives of the saints. They are in general printed in outline, to be filled in with color either by hand or by stencil. They are usually crude in workmanship, prepared for those who could not afford better pictures. The purpose which many at least of the image prints served—and which reminds one strangely of the charms with which printing in the Far East began—is indicated in the two lines of script that appear beneath the picture of St. Christopher, of which the following is a rough translation:

"In whatsoever day thou seest the likeness of St. Christopher,
In that same day thou wilt from death no evil blow incur."

The line of development from the image print to the block book is not difficult to trace. The earlier image prints are without text. Then come pictures with text beneath. Soon the practice began of

pasting these pictures on the pages of a book and writing under each one a few words of explanation. Finally printed pictures with printed text were made up together into books, the printing being done on one side of the page and the blank pages folded together, as in the books of China. There is some controversy as to when the first of these block books were produced. Of those that bear dates there is none that antedates the earliest work of Gutenberg. The making of block books went on parallel with typography up to the early years of the sixteenth century. The weight of evidence however seems to indicate that the earliest *undated* block books preceded by at least a few years the earliest books printed from type and that they were one of the influences suggesting the idea that whole books could be printed. According to one theory—the one accepted in the article on typography in the Encyclopedia Britannica—the inventor of typography was himself first a maker of block books.

The importance of block printing as the precursor of typography has long been recognized.[2] It remains to carry the question back and inquire what were the impulses that lay back of block printing—why at the end of the fourteenth century men began to make inked impressions on paper that in a short time developed into printed books. It may safely be said that there were four main impulses which combined to produce block printing and which finally culminated in typography, (a) the *demand* created by an awakening intellectual life, (b) the strong and inexpensive *material*, paper, which was just coming into general use, (c) *analogous practices* already in vogue in Europe, such as seal cutting and textile printing, that made the new art easy to learn, and (d) *some impulse from without* that determined the direction the new art should take, both as to design and as to technique.

In all these factors the Crusades and renewed contact with the East played an important part. Europe, whose intellectual life had been largely dormant through the Dark Ages, flung herself with abandon against the older civilization of the East. The struggle affected Europe more than it did the East. Influences from

Byzantium and from the Islamic world, echoes from ancient Greece preserved in the lands of the East, all surged back into Europe in a great flood. The very fact of travel, the constant meeting of new experiences, awakened all the latent powers of Christendom. It was this new life surging through the Western world that was after all the most important of the various factors in the preparation for printing.

In this new life current that swept through Europe in the fourteenth century there were also influences from the Far East that had their part, influences as strong—and as obscure—as gunpowder and the Black Death, both of which apparently spread from the Pacific to the Atlantic during this century and arrived in Europe about the same time. Throughout the century mariners in the Mediterranean as well as in waters further east were in fear and trembling experimenting with the mysterious magnetic needle, preparing for the great age of discovery that was about to set in. But more important than gunpowder or plague or compass was the advance of paper. At the opening of the century paper was a fairly rare material, imported from Damascus and Spain, and being turned out in small quantities from two or three mills newly established in Italy. By the end of the century it was being manufactured in Italy, France, Spain and southern Germany, and had largely displaced parchment as the writing material of all but the wealthy.[3] It was paper that made printing worth while. There would have been little use in a cheap method of duplication, if the only material available had been as expensive as sheepskin. Gutenberg's Bible was one of the few early books printed on parchment, and each copy of Gutenberg's Bible is said to have required the skins of three hundred sheep.[4] Without a cheaper material to print on, the invention of printing would have been abortive.

In addition to influences from the East, Europe had within her own borders certain processes that made the transition to block printing natural and easy. Egypt and Babylon had already in ancient times used wooden blocks to stamp their bricks; Rome had

had dies for making coins, engraved seals for impressing wax, and metal letters for branding cattle and slaves; the Middle Ages had added the art of textile printing. When Europe was ready for the next great advance, there were men with hands trained who readily transferred their skill to the new art.

The beginnings of the intellectual awakening created the demand for printing; China—by way of Damascus and Spain—furnished the material; textile printing and other similar practices gave the requisite skill. The fuel was ready—all that was needed was to apply the match. A study of the facts concerned leads with a very fair degree of certainty to the conclusion that that final impulse came from China.

In the first place the way was open. It was in the first half of the fourteenth century that the Central Asian trade routes, and the sea routes to Cathay as well, were wide open as never before. It was in this same half century that John of Monte-Corvino and his followers were engaged in missionary work and translating Christian books in Cathay. It was during this half century that Tabriz attained its greatest fame as a cosmopolitan center, with its colonies of Genoese and Venetians, of Uigurs, Mongols and Chinese, and that Rashid at Tabriz wrote his description of Chinese printing. It was at this same time that Mongol Russia rivalled Persia as a pathway to the Far East. For this was the time when the Mongol power was supreme from the Euphrates and the Volga to the Pacific. And it was just at the close of this period of wide open intercourse that block printing in Europe had its beginnings.

An examination of the prints themselves, the materials used, the technique, and their general character, leads naturally to the conclusion that this intercourse bore fruit. Textile printers had used various dyes, preferring, as a rule, the brightest colors. The printers on paper (itself a Chinese material) from the first used ink, and their ink was made almost exactly like that of China, from lamp black and gum, dissolved in water. The use of oil as a dissolving agent, which was one of the factors that made the work

of Gutenberg a success, and which probably began in Korea a few years before Gutenberg, had not yet been discovered either in Asia or in Europe. As to the method by which the European block prints were produced, the consensus of opinion is that it too was very similar to that of China. A block of wood with the desired picture or text cut in relief was inked and held in one hand; the paper was laid on it with the other and rubbed with a brush or frotton. There was no press. Neither were there two blocks, as in the printing of textiles. As a result of their similarity of technique, both European and Chinese block prints are printed on one side of the paper only.[5] Furthermore, both in the European prints and in very many of the Buddhist prints of Central Asia, color was later applied either by hand or by means of a stencil.

But the most striking fact about the early European prints is the choice of subject. Those that have come down to us, aside from playing cards, are all of one kind—religious image prints.[6] The printers of textiles had made designs—geometric designs, animal designs, heraldic designs: those who used paper as a material produced religious pictures. These image prints were the patron saints, the bringers of good luck, prepared for humble folk, just as were the Buddha prints of Central Asia and the printed talismans of Egypt. They satisfied the religious instinct of the common man, as playing cards, the one other sort of early printing of which we have record, satisfied his play instinct. Hence they were needed in quantity. If block printing had been a natural development from textile printing without outside influence, we might expect a certain continuity of design. Instead we have continuity with Central Asia and China rather than with European textiles.[7]

This continuity with China did not end with the appearance of the first primitive prints. Printing in Europe as in China soon developed into the making of books—into an art that affected the whole life of the people. It is true that in Europe block printing, as not suited to the Roman alphabet, soon proved abortive and that the great development came only with typography. But the

significant thing is that Europe, following the path of China, quickly advanced from the primitive stage to a method for the wide dissemination of books and of education.

The way between Europe and the Far East was open, an examination of the earliest printing, both image prints and playing cards, naturally suggests a close connection, and later developments in Europe and in China were in the same direction. The circumstantial evidence is strong. The one bit of early direct evidence, that of Jovius, has been referred to in an earlier chapter.[8] Until further and more convincing direct evidence can be found, the case cannot be considered as absolutely proved. Yet the contrary view is far more difficult to believe—the view that, with such intercourse as there was between Europe and the Far East, a practice so similar in its various manifestations should have arisen in the two parts of the world altogether independently. While keeping an open mind for further light, it will be safe to accept as a working hypothesis the view that Chinese influence was not only seen in the use of paper, but was the final determining factor in the ushering in of European block printing.

PART IV

PRINTING WITH MOVABLE TYPE

CHAPTER XXII

THE INVENTION OF MOVABLE TYPE IN CHINA

WHILE the T'ang Dynasty (618–907) has a freshness that reminds one of the Elizabethan Age, the time of the Sung emperors (960–1280) has a polish, a love of system and a scientific spirit that are essentially Victorian. The Sung mind was that of the modern man. Accounts written at this time of the early history of the human race have about them an evolutionary flavor seldom met with in Europe till the last century, while the financial and social reforms of Wang An-shih foreshadowed Karl Marx. In spite of political upheaval and financial chaos, science and philosophy went forward.

Nowhere is this progress more marked than in the realm of printing, which was itself one of the causes of the spirit of advance. It was in 953, seven years before the Sung Dynasty began, that under Fêng Tao's administration the Confucian Classics were finally published and the era of large scale official and secular printing inaugurated. The rapid printing of all sorts of books that immediately began in the wake of Fêng Tao's epoch-making publication naturally made men think of improved methods of producing printed books.

One experiment was in the use of metal blocks instead of wood. As the characters were not cut into the metal, as in modern engraving, but stood out in relief as in the wooden block, printing done with such metal plates cannot be easily distinguished from ordinary block prints, and it is uncertain how extensively metal plates were used. There are only a few references to this process in literature.[1]

Far more important was the experimentation that began early in the Sung Dynasty with movable type. Fortunately we have a

clear account of this invention written by a contemporary writer, Shên Kua, whose description bears the marks of an eye-witness, and the authenticity of whose writings is unchallenged.

"Under the T'ang Dynasty," writes Shên Kua, "block printing, though carried on, was not fully developed. In the time of Fêng Ying-wang (Fêng Tao), first the Five Classics and then in general all the ancient canonical works were printed.

"During the period *Ch'ing-li* (1041–1049) Pi Shêng,[2] a man in cotton cloth (i.e., a man of the common people),[3] made also movable type. His method was as follows: He took sticky clay [4] and cut in it characters as thin as the edge of a cash.[5] Each character formed as it were a single type.[6] He baked them in the fire to make them hard. He had previously prepared an iron plate and he had covered this plate with a mixture of pine resin, wax and paper ashes.[7] When he wished to print, he took an iron frame [8] and set it on the iron plate. In this he placed the type, set close together. When the frame was full, the whole made one solid block of type. He then placed it near the fire to warm it. When the paste [at the back] was slightly melted, he took a perfectly smooth board and rubbed over the surface, so that the block of type became as even as a whetstone.

"If one were to print only two or three copies, this method would be neither convenient nor quick. But for printing hundreds or thousands of copies, it was marvellously (lit. "divinely") quick. As a rule he kept two forms going. While the impression was being made [9] from the one form, the type were being put in place on the other. When the printing of the one form was finished, the other was all ready. In this way the two forms alternated and the printing was done with great rapidity.

"For each character there were several type, and for certain common characters [10] there were twenty or more type each, in order to be prepared for the repetition of characters on the same page. When the characters were not in use, he had them arranged with paper labels, one label for each rhyme,[11] and thus kept them in wooden cases. If any rare character appeared that had not been

prepared in advance, it was cut as needed and baked with [a fire of] straw. In a moment it was finished.

"The reason why he did not use wood is because the tissue of wood [12] is sometimes coarse and sometimes fine, and wood also absorbs moisture, so that the form when set up would be uneven. Also the wood would have stuck in the paste and could not readily have been pulled out. So it was better to use burnt earthenware. When the printing was finished, the form was again brought near the fire to allow the paste to melt, and then brushed with the hand, so that the type fell of themselves and were not in the least soiled with clay.

"When Pi Shêng died, his font of type passed into the possession of my followers,[13] and up to this time it has been kept as a precious possession."[14]

Shên Kua, the writer of this careful description, lived from 1030 to 1093. He was therefore a boy in his teens at the time of Pi Shêng's invention. His book, *Mêng-ch'i-pi-t'an*, or Essays from the Torrent of Dreams, describes many natural phenomena, and contains the earliest clear description of the compass, as well as this contemporary account of the world's first attempt at typography. He is regarded as one of the most accurate of the Sung writers. If the text of the older edition is the correct one, he must have been a personal friend or acquaintance of Pi Shêng, the one in whose hands (or in the hands of whose "followers") the font of type was left at the inventor's death.[15]

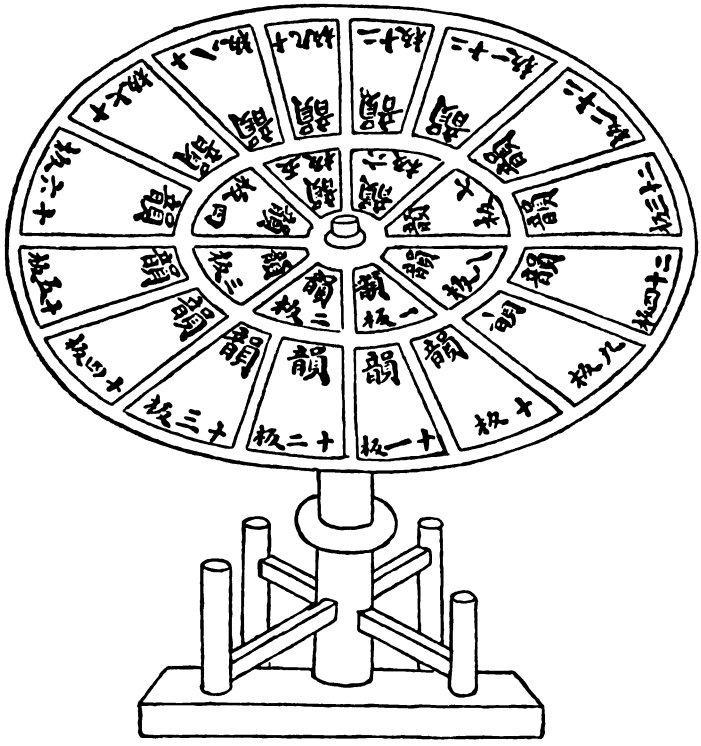
During the period of the Mongol Dynasty, in the year 1314, a brief review of the history of movable type up to date was written by a man named Wang Chêng.[16] Starting with the invention of block printing (which according to the generally accepted view he assigned to Fêng Tao's time), he proceeded to tell of Pi Shêng's invention and the type made first of earthenware and then of tin that followed it, and finally described in detail the wooden type of his own day and a device which he himself had perfected for the setting of type. The following is Wang Chêng's statement:

"In ancient times all books were manuscripts. The learned found the spreading abroad of books by copying a difficult matter, and the keeping of books was considered a thing that required wealth.

"During the period of the Five Dynasties, in the year 931, the prime minister Fêng Tao, together with Li Yü, memorialized the emperor, requesting that orders be given to the director of the National Academy, T'ien Min, to revise and correct the Nine Classics, to have them cut on wooden blocks and printed and to have copies sold. The emperor gave the order. This was the beginning of printing from wooden blocks.[17] Following this the use of printed literature became general throughout the empire. There was however a great outlay for blocks and for labor, so that sometimes the blocks for a single book, unless great energy was used, were not completed till after some years had elapsed. Although there were books that were well worth printing, they often could not be produced and published because the cost of labor was lacking.

"At a later period there was a man who invented a wonderful device. He made out of iron [18] a composition form for keeping the columns distinct, over which he poured liquid tar [19] which became hard when cooled. When this had been held over a slow fire and slightly melted, he placed in the form earthenware type that had been thoroughly hardened by burning, and so out of movable type he made blocks for printing. Inasmuch as his method was not altogether practicable, a step forward was taken later by making the compositor's form of earthenware, and setting the type of burnt earthenware in it in thin clay. When this form full of burnt clay type had been placed in the fire and also burned till the whole had become one solid mass, it could be used for printing just like any wooden block.

"In more recent times, type have also been made of tin by casting.[20] These are strung on an iron wire, and thus made fast in the columns of the form, in order to print books with them. But none of these type take ink readily, and they rapidly deteriorate



THE REVOLVING WHEEL

Typesetting device described by Wang Chêng in 1314. From edition of Ch'ien Lung's reign (1736–1796). Whether this illustration goes back to the original edition of 1314 or whether it is a reconstruction by Ch'ien Lung's editors, is uncertain. In either case it shows the device which Wang Chêng described

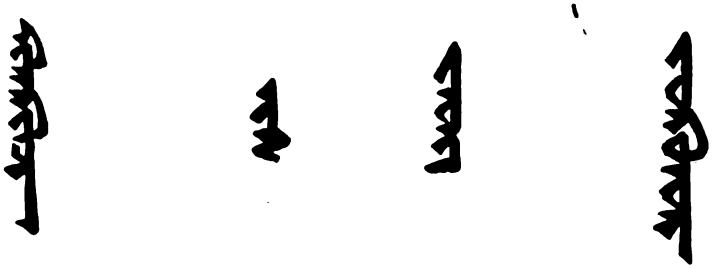
Liu An.

WOODEN TYPES OF THE EARLY FOURTEENTH CENTURY AND IMPRESSIONS FROM THEM

These types, found by Professor Pelliot in one of the Caves of the Thousand Buddhas, date from about the year 1300. They are in the language of the Uigur Turks. Each type represents a word

(Height to paper 2.2 cm.; width 1.3 cm.; length varying from 1.0 cm. to 2.6 cm. according to length of word)

Metropolitan Museum, New York.



IMPRESSIONS FROM THE WOODEN TYPES OF THE EARLY FOURTEENTH CENTURY IN THE UIGUR LANGUAGE

Gusman.

in the course of printing. For that reason they cannot be used long.

"Now, however, there is another method that is both more exact and more convenient. A compositor's form is made of wood,[21] strips of bamboo are used to mark the lines and a block is engraved with characters. The block is then cut in squares with a small fine saw till each character forms a separate piece. These separate characters are finished off with a knife on all four sides, and compared and tested till they are exactly the same height and size. Then the type are placed in the columns [of the form] and bamboo strips which have been prepared are pressed in between them. After the type have all been set in the form, the spaces are filled in with wooden plugs, so that the type shall be perfectly firm and shall not move. When the type are absolutely firm, the ink is smeared on and printing begins.

"The Writing of the Rhymes and the Cutting of the Type. First, a division is made of all characters into the five tones and into rhyme sections according to the official Book of Rhymes. According to this arrangement, a complete copy of the characters in that book is made. A skilful calligrapher is chosen who picks some writing which shall serve as model for the type. In accordance with exact measurements as to size, he writes one copy of every character. These are pasted on the wooden block, and a workman is ordered to engrave them. A little space is left between the characters for sawing. For each auxiliary,[22] numeral and other specially common word, there is a larger number of type made. In all, somewhat more than thirty thousand type are needed. When the patterns have been written, the type are made as disscribed above.

. . . . . .

"The Sawing and Finishing of the Type. After the engraving of the characters on the wooden block, each single character is cut on all sides with a small fine-toothed saw, and the type are then put in a wicker basket. Next, the type are finished off with a small knife until they are alike and exact. After that they are sub-

jected to careful measurement, and by this measurement are tested for exact uniformity in size and height. Finally they are put away in a special container.

"The Cases and the Placing of the Type in them. The type from the various sections of the official Book of Rhymes are arranged in wooden cases and held in rows with bamboo strips. After they are all laid in, they are lightly kept in place with wooden plugs, and arranged upon a revolving table (lit., *a wheel*).[23] The division is according to the five tones, as described above, and large characters are used for labels.

"The Making of the Revolving Table. Out of light wood a large table top is made, about seven feet in diameter. The central leg of the table (lit., *the axle of the wheel*) is about three feet high. On the floor there is a large wooden pedestal with holes bored in it. The leg of the table fits in the center of one of these holes, and is strengthened with wooden braces, while in the bottom of the table top there is a cavity [24] for the shaft [25] [of the table leg] in order that the entire top of the table may revolve. Upon the table is a round bamboo frame in which the movable type are kept. Each section of the table is numbered, the numbering going from top to bottom. As a rule, two such tables are provided. Upon the one are the type from the official Book of Rhymes. Upon the other are the special type (i.e., the selection of most usual characters). Between the two sits a man, who is able to turn the tables either to right or to left and to take out the type. For if the man had to go about and seek for the type, it would be difficult, but when the type come to the man, it is easy. By the use of this revolving wheel, without putting forth any effort, just by sitting still, the typesetter can select the type wanted, and again, after they have been used, put them back in their proper rhyme-compartments—both of which things are very convenient.

"The Setting up of the Type. A special list of characters is written according to the Book of Rhymes with the characters all numbered. Each section of the two revolving tables, each row and each type is then numbered to correspond to this list. A man

holds the rhyme list and calls for the type by number. Another takes the type from the compartments on the table and places them directly in the form for the printing of the book. Unusual characters that are not found in the Book of Rhymes, are made by the wood-cutter as needed, so that everything may be complete.

"The Construction of the Form, the Fixing of the Type in it, the Application of the Ink and the Printing. Select a smooth, dry block. Estimate the dimensions of the book [to be printed] and make about the four edges of the block a [wooden] edging. Leave the right hand edge open until the form is full, then mount this edging also and fasten tightly with wooden plugs. The type within the columns of the form must be so fixed that they are exactly even and correct, one with the other. For this purpose there are prepared in advance little slivers of bamboo of various sizes, which are kept in a special receptacle. If the type do not stand exactly even in the form, these bits of bamboo are wedged in. Not until the type stand absolutely even and firm is printing begun. The inking of the form must be done with a brush down the columns. Care must be taken that the inking be done vertically and never across. Finally for taking the impression upon paper the columns must likewise be rubbed with a brush from the top down.[26]

"This is a description of how the use of movable type was fixed.

"When I was district magistrate in charge of the magistracy of Ching-tê in the district of Hsüan-chou, I composed the Book of Agriculture. However, inasmuch as the number of characters used in that book was very large, I found difficulty in having it printed from blocks. I therefore followed an idea of my own and had artisans make for me movable type. This work was finished in two years. Then as an experiment I printed the official records of the district,[27] using for the purpose about sixty thousand type or more. In less than a month a hundred copies were completely ready and were exactly like books printed from blocks. This was for me a proof of the practicability of my system.

"Two years later I was transferred to the magistracy of Yung-fêng in the district of Hsin-chou, and when I went to my new office I took the type with me. At this time the Book of Agriculture had just been finished and I wished to have it printed with movable type. I then found out, however, that printers in the province of Kiangsi had already begun to cut the blocks for this work. Therefore I laid the type aside in order to await another opportunity for their use. But inasmuch as I have never seen this method described either in ancient or modern times, I therefore describe it here for the sake of all those who are interested in such things, hoping thus to pass on to future generations this simple and easy method of printing. Inasmuch as the occasion for the discovery of the method was the writing of the Book of Agriculture, I describe the method here at the close of this book."

Such is the description of type production and typesetting that was written in the year 1314, during the period of Mongol domination, and about twenty years after Marco Polo's return to Venice.

It is worth while to note what steps have here been made in the direction of modern printing and what great gaps remain to be filled. This achievement of Wang Chêng's depends in the main on two factors, the production of type of such a form that they could be made to fit together in a perfectly even and rigid block, and such systemization and mechanical arrangement of the symbols of the script as to make typesetting possible. The achievement of these two things makes the invention here described an epoch-making step forward in the history of printing. On the other hand there are three important features which contributed to make the work of Gutenberg a success but which were lacking in the Chinese method—the type mould, alphabetic type, and the press. The type mould—and with it the use of metal type—was perfected either in China or Korea during the following century and extensively used during the half century before Gutenberg's invention. The other two, alphabetic type and the printing press, are distinctly European additions to the art of printing, to which the East can lay no claim.

Authorities seem to agree that Pi Shêng's clay type and the type of tin that followed were never extensively used.[28] How far wooden type were used is unknown. Books printed with wooden type can seldom be distinguished from those printed with blocks. There is one book of the Sung Dynasty in which a Chinese character appears lying on its side instead of upright, and this, ever since the end of the eighteenth century when the defect was first pointed out by a Chinese writer, has been regarded as evidence that the book was printed with movable type.[29] A more critical examination than has yet been made of the books of the Sung and Yüan Dynasties for misprints or other indications might shed some light on the extent to which movable type were used in this early period. It seems probable that the use of wooden type in some form or other was more widespread than that of Wang Chêng's revolving tables.[30]

Most important evidence corroborating Wang Chêng's description is the font of wooden type found by M. Pelliot on the floor of one of the caves of Tun-huang. These are without doubt the earliest movable type in existence. From the deposit in which they were found and other factors, M. Pelliot has given the date as approximately 1300. There are several hundred type, most of them in perfect condition. They were made of hard wood, cut out with a fine saw, of exactly the same height and depth, and they meet perfectly the requirements of Wang Chêng's contemporary description.

There is just one marked difference, however, between Wang Chêng's type and those found by Professor Pelliot.[31] While the former were Chinese, those found at Tun-huang are in the Uigur script. By the time these type were produced, movable type printing had so spread and had become so at home in Central Asia that a font of type had been produced in the Uigur script, the whole genius of which is entirely different from Chinese. As Uigur writing is alphabetic, being based ultimately on Aramaic, it would seem natural that the Uigurs, when they began to use movable type, would immediately see the advantage of having these type

represent single letters, a system so infinitely less cumbersome than that in use in China. Perhaps they did, but if so, we have no record of the fact, and no examples of alphabetic type have been found. The discovery at Tun-huang consists entirely of word-type, in slavish imitation of the Chinese system. The alphabetic structure of the script merely changed the square Chinese type of Wang Chêng's description into type whose length varied according to the length of the word.

The significance of this discovery at Tun-huang lies in the confirmation it gives of the contemporary records, and in the evidence afforded that already in Mongol times printing with type had spread westward into Central Asia. The remarkable spread of type-printing eastward and its improvement in the hands of the Koreans will be shown in the next chapter.

CHAPTER XXIII

THE GREAT EXPANSION OF MOVABLE TYPE PRINTING IN KOREA

KOREA came under the domination of the Mongol Empire before the death of Jinghis Khan, but retained throughout the Mongol period a certain amount of autonomy, the kings of the native Koryu Dynasty merely receiving their appointment from the Great Khan and acknowledging his suzerainty. After the imperial court had become thoroughly Chinese under Kublai and his successors, it became the custom of the Korean kings to spend a large part of their time at Cambaluc (Peking). Korea had always been accustomed to draw her cultural stimulus from China, but during the Mongol period this cultural connection became peculiarly close. In 1314 a library of 10,800 books was brought to Korea from Nanking, to which the Mongol emperor added some 4,070 volumes. The relationship that was established at this time brought Korea close also to the countries of Central Asia, and it is generally believed that the large number of Sanskrit and Tibetan books that are still found in the monasteries of Korea date from the Mongol period.

The last years of the Mongol Dynasty and the first years after its overthrow were a time of misgovernment and anarchy in Korea. The last degenerate kings of the Koryu line spent their time in pleasure and license at the court of Cambaluc, and, after the Mongol Dynasty had been overthrown, in stupid vacillation between allegiance to the defeated Mongols and allegiance to the victorious Mings, while meanwhile the country was altogether a prey to Japanese pirates. In 1392, Korea's great hero, General Yi, put an end to this condition by deposing the last weak Koryu king and taking the throne, thus ushering in a line of energetic rulers, who for a century gave Korea the best government the

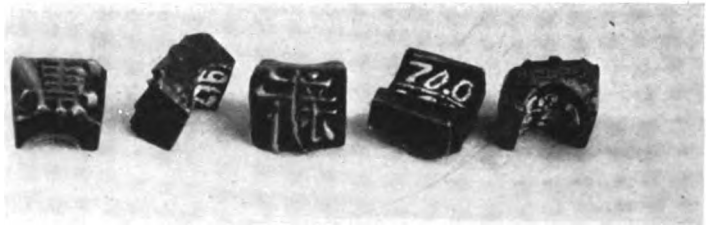
country has ever known. This century of good government, under kings who were not only strong rulers but were patrons of literature as well, was the time when Korea led the world in printing and developed to a high degree the use of metal type.

The first mention of a type foundry is in 1392, the very year the new dynasty was started. The Korean annals for this date contain the statement: "A department of books was established, which had as its responsibility the casting of type [1] and the printing of books." [2]

Whether the practice of casting type went back further than this is uncertain. There is evidence that has led some to believe that metal type were in use in Korea during the period 1232–1241,[3] and in the British Museum there is a book printed with type in Korea that on two title pages bears the dates 1317 and 1324.[4] But the authority for the thirteenth century date is not convincing, and the British Museum book may easily be a reprint containing the dates of the two original block-printed works. The earliest certain date for Korean typography is the starting of the "Department of Books" in 1392,[5] and Korean writers of the next century regarded the year 1403, the time when this department actually began work, as marking a new era in the history of printing.

While in the Far East, as later in Europe, the beginnings of *block printing* had been so gradual and unheralded as to be almost untraceable, the beginning of the official use of *metal type* for the printing of books was immediately hailed as a great invention. Both the Korean annals and the prefaces [6] of the books printed abound in ascriptions of praise to the kings who have enhanced the glory of their reigns by fostering this great invention.

The new department apparently did little till the year 1403. Two years before this the founder of the dynasty had died, and the energetic crown prince, to whose skill the successful establishment of the dynasty had been largely due, had come to the throne under the name of T'ai Tsung. T'ai Tsung, a reformer who by his energy and ability brought about radical changes in Korean life, is by



EARLY KOREAN METAL TYPES

Of uncertain date, preserving the form of the type of the early fifteenth century
(Actual size)

American Museum of Natural History.

many regarded as Korea's greatest king. The notice in the Korean annals of the beginning of official typography is as follows: "In the third year of T'ai Tsung (1403), the king thought with sadness of the fact that so few books could be printed. He founded therefore an establishment for the making of type and had books printed with them. The carrying on of the work was put in the hands of certain officers [here follow the names], and the metal for the purpose was furnished by the government." [7]

A fuller account of this same event [8] appears in the preface of a book [9] which, according to a statement on its title page, was printed with movable type in 1409 and a copy of which is still preserved: "In the second moon of the first year of *Yung-lo* (1403),[10] the king said to his attendants, 'Whoever is desirous of governing must have a wide acquaintance with the laws and the Classics. Then he will be able to act righteously without and to maintain an upright character within, and thus to bring peace and order to the land. Our eastern country lies beyond the seas, and the number of books reaching us from China is small. The books printed from blocks are often imperfect, and moreover it is difficult to print in their entirety all the books that exist. I ordain therefore that characters be formed of bronze and that everything without exception upon which I can lay my hands be printed, in order to pass on the tradition of what these works contain. That will be a blessing to us to all eternity. However, the costs shall not be taken from the people in taxes. I and my family, and those ministers who so wish will privately bear the expense.'[11] Then was money in great abundance given from the private treasury of the king, and officials appointed [list of names] to superintend the undertaking and to carry it out. The Book of Poetry, the Book of History and the Commentary of Tso were given from the royal palace to furnish models for the type. The casting began on the nineteenth day of the same month, and within a few months several hundred thousand type had been cast. . . . These type were cast in order that all books might be printed. May they extend to a myriad volumes in number and be handed

down through a myriad of generations. Thus vast was the design, so deep and far-reaching the thought that inspired it."[12] This preface is dated in the eleventh month of the same year (i. e. between December 14, 1403, and January 12, 1404) and appears in exactly the same form in books printed in 1409, 1434 and 1437.

That this event was regarded by Korean writers as on the one hand connected with the Chinese invention of movable type, and on the other as marking a new era in the history of printing, is indicated by the following statement written in Korea toward the close of the century. "The movable type method was begun by Shên Kua[13] and brought to perfection by Yang Wei-chung. All old and new books in the world could be printed with these type, so that their use was very great. But the type were usually made of burnt earthenware, were easily broken and were not durable. After some hundreds of years there had been great progress in intelligence, and then type were made of bronze in order to preserve them forever. I am confident that the beginning of this was under our dynasty. Kung Ting Wang (another name of T'ai Tsung, the dates of whose reign are 1401 to 1419) was the first to make them. Chuang Hsien Wang (1419–1451) and Hui Chuang Wang (1456–1469) carried on the work. Then the perfection of movable type could go no further. . . . From the time of Chi-tzŭ (the reputed founder of the Korean kingdom, about B.C. 1100) Korea has been a literary nation, but, being separated from China, there has been a lack of great books. Fortunately through the inventive wisdom of the sages of our dynasty, who have discovered the art of casting type to print books, all Classics, histories, books of philosophy and literary collections are in every home."[14]

Improvements—and with them new fonts of type—followed one another in rapid succession, eleven royal decrees relative to the casting of new fonts being recorded from 1403 to 1544. The best writers in the land were employed to write characters as models for the typemakers, and the autographs of ancient Chinese calligraphers were also used. The enthusiasm went so far that,

when there was lack of bronze, the bells of ruined monasteries and vases and instruments belonging to individuals and to various government departments were melted up.[15]

The second font was cast in 1420,[16] and a record of its founding is preserved in the second preface[17] (dated 1422), of a book printed in 1437:[18] "The invention of cast type for printing all kinds of books for transmission to posterity is truly of infinite advantage. But at first the type thus cast did not attain to the highest degree of perfection, and printers lamented that the work was difficult to perform. In the eleventh month of the eighteenth year of *Yung-lo* (1420), His Highness of his own motion ordered his officer Li Tsang, a vice-president of the Board of Works, to cast a fresh set of type to be very fine and small, and he commanded the following officers [titles and names] to superintend and carry out the undertaking. The work was completed within the space of seven months. The printers found these type more convenient, and were able with them to print at the rate of twenty sheets a day. Our late king, Hung Ting Wang (1401–1419), had already done the same thing, and now His Highness, our present sovereign, has extended his work. It would be impossible to add to the perfection of the workmanship. Thus there will be no book left unprinted, and no man who does not learn. Literature and religion will make daily progress, and the cause of morality must gain enormously. The T'ang and Han rulers, who considered the first duty of the sovereign to be finance and war, are not to be mentioned in the same day with the sovereign to whom this work is due. It is certainly an eternal and boundless piece of fortune for this Korea of ours."[19]

The fine print was found to be unsatisfactory, and in 1434 a new font with larger type was ordered cast. "In the seventh month of the ninth year of Hsüan Tsung (1434)," the record runs, "His Highness said to Li Tsang, 'The books printed with type, cast under your superintendence, are certainly very beautiful and admirable, but it is to be regretted that the characters are difficult to read, owing to their small size. It would be a fine thing to

cast a fresh font from written characters of a larger size.' So he ordered him to superintend the undertaking. A commencement was made on the 12th day of that month (August 16th) and in two months' time over two hundred thousand type had been cast. On the ninth day of the ninth month (October 11th) the printing was begun, and it was found possible to print more than forty sheets a day. The clearness and exactness of the type made the labor twice as easy as under the old conditions. . . . After two successive reforms the type cast had attained the greatest possible degree of beauty and are indeed a treasure for this Korea of ours for all time to come."[20] These three fonts were cast before the invention of printing in Europe—in 1403, 1420, and 1434. They were followed by new fonts in 1455 and 1465 and finally by a very magnificent printing outfit in 1484. It is evident that a large number of books was printed from each font. Sir Ernest Satow in 1882, in two libraries in Japan, found thirty-seven books still preserved, dating from 1409 to the end of the century, the oldest of which bear the dates 1409, 1434, and 1437. A large number more are now to be seen in the monasteries and libraries of Korea and Japan.

Like the Uigurs, the Koreans came so close to the use of alphabetic type that it seems strange that they should have stopped at the threshold of this further advance. From the earliest times Chinese had been the literary language of Korea. The Koreans had also worked out a method of expressing their own language more or less clumsily in Chinese characters. But during the Mongol period Koreans came closely in contact with the alphabet-using peoples of Central Asia—peoples whose languages were more akin in structure to their own. Large numbers of Sanskrit and Tibetan books found their way into Korean monasteries, and the study of foreign languages became a matter of interest. The result was that during the reign of the great literary king, Chuang Hsien Wang (1419–1450), who followed T'ai Tsung, a Korean alphabet was evolved—a very perfect phonetic alphabet based largely on Sanskrit. Just one book of early date in movable type

in the new alphabet is extant.[21] It is dated 1434. But it is printed in even more complicated form than that used by the Uigurs. It is in parallel columns, Korean and Chinese, the Korean showing the pronunciation of the Chinese characters. Each Chinese character with its corresponding Korean phonetic symbols forms a type. Again, as in the case of the Uigurs, printing was done with movable type in an alphabetic language, but again the idea of type representing single letters was, so far as known, not thought of.

Most of the books produced in Korea from metal type are royal editions. The title pages are in large characters, and prefaces in facsimile of the handwriting of the author are printed from blocks. Very frequently the title page mentions the fact that movable type were used. The style of the characters is that of Sung writing—a style that continued to be used down to the last century—so that early and late books are almost impossible to distinguish unless there is a date on the title page. During the early period Korean typography was confined to classical literature and books of history and morals.[22] Buddhist books in movable type are almost non-existent.

De Vinne, in his book on the invention of printing in Europe, writes, "The inventor of printing did not invent paper and did not originate engraving on wood. He was not the first to print upon paper, he was not the first to make printed books, it is not certain that he made the first press, it is not probable that he was the first to think of or make movable type. What he did was to invent the *type mould*—the first therefore to do practical and useful work."[23] The *type mould* then was the key to the invention of typographic printing. And it was the *type mould* that the Koreans developed. That is the significance of Korean printing. But it was a very different type mould from that of Europe. The European mould makes type so uniform that they naturally lock together and keep their alignment. The Korean type required mechanical contrivances, either a plate of wax or bamboo strips, and probably also a metal rod fitted into grooves of the type, to hold them in place. Song Hyon,[25] writing between 1495 and 1507, thus

described the Korean process: "Characters were cut first from beech wood, these were the models. Then sand was taken from the shore of the sea where the reeds grow. This was placed in a trough and the wooden letters pressed against it.[24] In this way the negative moulds were made, from which the type were cast. Over these was placed a cover with openings, and melted bronze poured in. When this cooled, it became type. Where irregularities occurred such as sharp corners, they were worked over afterwards with a file. The single type were held in columns by bamboo strips, so that they could not get out of line. At first it was not known how the type could be placed one against another and held firm, and for that purpose a wax plate was arranged for fixing the type. This, however, was not sufficiently firm, and so the practice began of fitting the type into a bamboo frame." [25]

In the Government Museum at Seoul are preserved a large number of ancient type which are believed by the Japanese museum authorities to belong to the early fifteenth century. In fact they have been classified as belonging respectively to the fonts of 1403, 1416, 1420, 1434 and later fonts. There are also in Leipsic and in the American Museum of Natural History [26] in New York Korean type which purport to be of the early fifteenth century. The data are not as yet sufficient to test the accuracy of these ascriptions. On the other hand it is probable that the style of type did not greatly change, and that an examination of the type now existing is useful in order to ascertain what the early Korean type were like. The type in New York are made of bronze and are quite rough in their workmanship. They are about one centimeter square, and the height to paper is only a little over half a centimeter. From the filing off of the jet, it can be seen just how the type were cast—the molten metal was poured in at the side of the type. Each type is grooved on the under side, evidently so that they could be laid along a metal bar to give the alignment. The edges, however, are so irregular that they never could have properly locked together. They must have been set in some soft material such as wax and made even with a planer. Judging from

the gradual slope where the space between the lines of the characters is cut away (in marked contrast to the direct deep cutting of our steel punches) it is quite evident that the models were made of wood. A certain roughness of the type indicates that the moulds from which the type were cast were of sand.

From Korea the use of metal type spread first back to China and later to Japan—but not so far as is known until after the invention of typography in Europe. The first book known to have been printed by the Japanese with movable type appeared in 1596,[27] just after the Japanese conquest of Korea, and from that date for the next thirty-three years there was a constant succession of books produced both with metal and with wooden type. Hundreds of different books were printed under imperial patronage, some of them very fine editions, among others an encyclopedia in two hundred and twenty-one volumes. Suddenly in 1629 all this activity stopped, and from that time till the coming in of European influence during the last half century, all Japanese printing was done with blocks.

In China printing with metal type began earlier than in Japan and continued through the eighteenth century. There was a printer by the name of Hua Sui [28] in the city of Wusih [29] who used bronze type some time about the end of the fifteenth century,[30] and there was printing carried on in Nanking at about the same time with type of both bronze and lead.[31] Throughout the Ming Dynasty there was a considerable amount of printing from type, among the books thus printed being the works of Mê Ti between 1522 and 1567 [32] and the *T'ai-p'ing-yü-lan* encyclopedia in 1572. In 1590 the earliest typography under European influence is recorded.[33] In 1662 a very perfect font of metal type was made under imperial direction, from which the *T'u-shu-chi-ch'eng*, an encyclopedia in six thousand volumes, was printed, as well as other works. The introduction to one of these works describes the process then in use for type-founding, which is similar to the process that had been in use earlier in Korea. Models were engraved in hard fine-grained wood, with them moulds were made in a sort of

porcelain paste baked in an oven, and from these moulds finally the type were cast. In 1736 there was a shortage of currency in the empire (and also, it would appear, in the pockets of certain officials) and this font was melted up for the minting of cash. It was replaced in 1773 by a font of wooden type with which a new imperial literary collection [34] was printed.[35]

In Korea itself the type-printing activity of the fifteenth century continued till 1544. Then it ceased entirely for more than two centuries. In 1770 a font of new type was made, and a few years later still another, with thirty-two thousand wooden models and three hundred thousand type. A large number of works were printed between 1770 and 1797 and a few continued to be produced through the larger part of the nineteenth century.[36]

In all three of the Far Eastern countries printing from metal type required large capital and was carried on almost entirely by the government, ceasing when government support was withdrawn. On account of the non-alphabetic structure of the script, block printing was found more practical for private and commercial purposes. By the nineteenth century the use of type had almost ceased in all three countries, and was reintroduced from the West as an entirely new art. Even to-day the use of type representing single letters or phonetic symbols has made little progress. In Japan, which has a syllabary of fifty symbols, similar in use to an alphabet, word type are still almost universally used, the Chinese character and its phonetic equivalent in Japanese phonetic (*kana*) appearing on the same piece of type. A modern Japanese newspaper requires a font of some twenty thousand different type.[37] For this reason, except for large presses in important centers of population, block printing has still retained its hold, especially in China, and, where it is giving way, it is being replaced in the smaller printing offices not by type, but by a new cheap form of lithography.

To sum up the progress of printing with movable type in the Far East. It began in China with Pi Shêng's invention of earthenware type in the eleventh century. It made considerable advance

with the development of wooden type during the Mongol period. It reached its highest point in Korea in the fifteenth century with the extensive use of cast metal type that began in the year 1403. The Korean system spread to China and Japan, and was the method in those lands, as it had been in Korea, by which strong monarchs sought to further literature and education. But it has never been a commercial success and by the nineteenth century had been almost altogether displaced by the older block printing which in its turn is now giving way in the larger centers to European typography. It is a strange fact that the nations the symbols of whose languages present more difficulties to the typographic printer than those of any other languages in the world, should have been the first nations to invent and develop the art of typography.

CHAPTER XXIV

THE PEDIGREE OF GUTENBERG'S INVENTION

ON the occasion of the five hundredth anniversary of Gutenberg's birth, a commemorative volume was published by German scholars, which contained a monograph on the geneology of the inventor's family. That is the pedigree of Gutenberg the man. It is possible now, in recapitulating the story of printing in China, to draw attention for a moment to certain persons who may be regarded as in a sense the ancestors, not of Gutenberg the man, but of Gutenberg the inventor of printing.[1]

If this pedigree is confined to that branch of the ancestry of the printer's art which bears evidence of leading back to China, the purpose of such emphasis is not to minimize the European line of descent—it is merely in order to leave the European line, which is beyond the scope of this volume, to those who have specialized in that direction. The bookbinders with their metal stamps, the engravers from metal plates, the block printers, the textile printers—that long line of ancestry leading back finally to the brick makers and seal cutters of Babylon and Egypt—all are of supreme importance for an understanding of the background of European printing.[2] But it is the other side of the family, so to speak, with which it is our purpose to deal here, a side that has hitherto been neglected.

First in that line stands an imposing figure, Ts'ai Lun the eunuch, inventor of paper (A.D. 105). Ts'ai Lun and Gutenberg, spiritual father and spiritual son. Of all the world's inventors these two, the inventor of paper and the originator of European typography, stand out preëminent as those who have advanced the cause of literature and education in the world.

Next in line stand certain men of unknown name and unknown date: the man who first rubbed his seal in ink and stamped it

on paper instead of on wax or clay; the Taoist makers of good luck, who enlarged their wooden seals, smeared them with red cinnobar and made with them potent charms; the long line of Buddhist priests and monks who sought by every conceivable device, including stamps of metal and wood, to multiply representations of the sacred Buddha.

The line now goes to Japan and includes the first imperial patroness of printing, the Empress Shotoku, the superstitious old lady who to prolong her life printed a million charms (A.D. 770).

Following her, and back in China once more, is Wang Chieh, the first known printer of books, who to honor his parents printed the long roll of the Diamond Sutra (A.D. 868).

Parallel to the Taoist and Buddhist lines were those Confucian scholars, who, more interested in the exact text of the Classics then in charms and sutras, started to cut that Classic text in stone, and from it to make rubbings or squeezes, which later came to be bound in books.

The various lines converge in the next great name, which to most Chinese writers is the greatest since Ts'ai Lun, Fêng Tao, the prime minister who held the empire together through the troublous reigns of seven emperors and four dynasties, and who showed his greatness by having printed during that period of anarchy the text of the Confucian Classics—a work that did for Chinese printing almost what Gutenberg's Bible later did for that of Europe (A.D. 953).

Following Fêng Tao the line again diverges. On the one side were the great block printers, who for the next four hundred years printed everything that was worth preserving and printed it well, making block printing a vehicle for thought and education such as it has not been in any other part of the world.

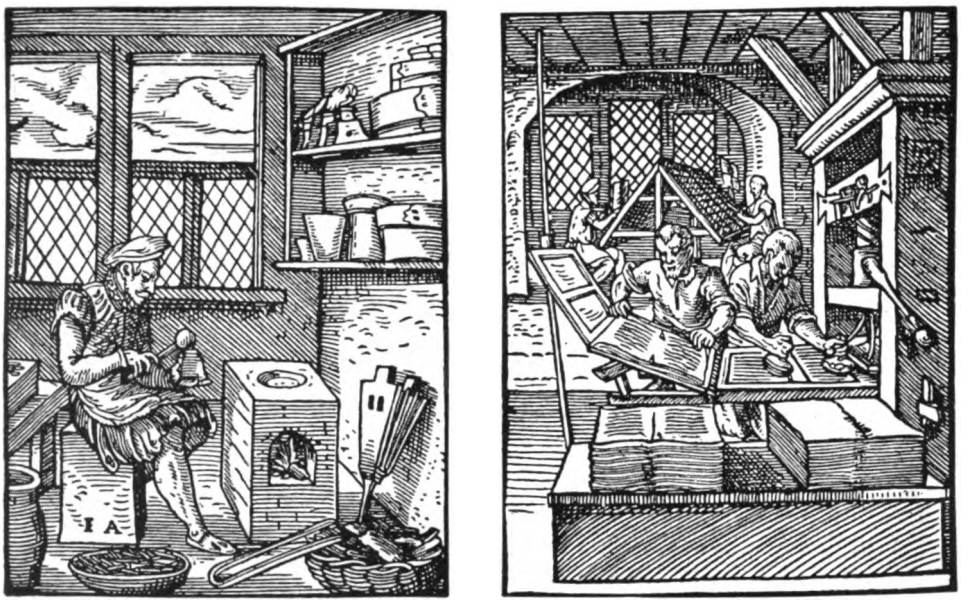
On the other side were the experimentors with movable type, whose place in this ancestral table is perhaps more collateral than direct. The first of these, Pi Shêng the smith (between 1051 and 1059) made his type of baked clay. His device was ingenious, but after his death it was never greatly used. The second was Wang

Chêng, who has left us a detailed record (1314) of the method used in his day for printing with wooden type, a record confirmed by type that have been found at Tun-huang. Following Pi Shêng with his type of clay and Wang Chêng with his type of wood, were the Korean kings of the half century before Gutenberg who printed at royal expense a goodly number of books from type of bronze—type that now for the first time were cast from moulds.

Such is the pedigree of the invention of printing on the Chinese side. It must not be supposed that all the persons mentioned are necessarily in the direct line of ancestry of the European inventor. The last three in particular, the inventors and perfectors of type, would seem perhaps to be a collateral branch, as it were—cousins rather than ancestors of the inventor of European typography.

This question of direct connection between the type of earthenware, wood and bronze of the Far East and the invention of printing in Europe is a difficult one, but the evidence so far is negative. Pi Shêng's type were never greatly used and had been almost forgotten before close intercourse with Europe under the Mongols began. Wooden type were in use at the time European intercourse was at its height, but the hundred years that elapsed after the closing of the trade routes and before the invention in Europe are difficult to bridge over. The Korean type were far more largely used than their clay and wooden prototypes had been, and it seems a strange coincidence, if, entirely without connection, the Koreans began printing with metal type just half a century before Gutenberg's invention. Yet there is no evidence of such connection. And intercourse between Europe and the Far East during that half century was, so far as we now know, almost non-existent. To state categorically that there was no direct connection between the typography of China and Korea and that of Europe would be premature. On the other hand no clear evidence of such connection has been found,[3] and until such evidence—or the contrary—is at hand, it is necessary to keep an open mind.

If China's influence on European printing was probably not



EARLY EUROPEAN TYPOGRAPHY

From woodcuts by Jost Amman, 1568

Schreib und Buchwesen.

venderetur alteri: quantocumque fuerit ante estimatum. Omne quod domino consecratur sive homo fuerit sive animal sive ager non veniet: nec redimi poterit quicquid semel fuerit consecratum. Sanctum sanctorum erit domino. Et omnis consecratio que offertur ab homine non redimetur: sed morte morietur. Omnes decime terre sive de pomis arborum sive de frugibus domini sunt: et illi sanctificantur. Si quis autem voluerit redimere decimas suas: addet quintam partem earum omnium decimarum. Boves et oves et capre que sub pastoris virga transeunt: quicquid decimum venerit sanctificabitur domino. Non eligetur nec bonum nec malum: nec altero commutabitur. Si quis mutaverit: et quod mutatum est et pro quo mutatum est sanctificabitur domino: et non redimetur. Hec sunt precepta que mandavit dominus moysi ad filios israhel in monte synai. Explicit liber leviticus. Incipit vaiedaber id est liber numeri. I

Locutusque est dominus ad moysen in deserto synai in tabernaculo federis: prima die mensis secundi anno altero egressionis eorum ex egipto dicens. Tollite summam universe congregationis filiorum israhel per cognationes et domos suas et nomina singulorum quicquid sexus est masculini a vicesimo anno et supra omnium virorum fortium ex israhel: et numerabitis eos per turmas suas tu et aaron. Eruntque vobiscum principes tribuum ac domorum in cognationibus suis: quorum ista sunt nomina. De tribu ruben: elysur filius sedeur. De tribu symeon: salamihel filius surisaddai. De tribu iuda: naason filius amminadab. De tribu isachar: nathanael filius suar. De tribu zabulon: eliab filius helon.

Filiorum autem ioseph de tribu ephraim: elisama filius ammiud. De tribu manasse: gamalihel filius phadassur. De tribu beniamin: abidan filius gedeonis. De tribu dan: ahiezer filius amisaddai. De tribu aser: phegiel filius ochran. De tribu gad: eliasaph filius duel. De tribu neptalim: ahira filius enan. Hii nobilissimi principes multitudinis per tribus et cognationes suas et capita exercitus israhel: quos tulerunt moyses et aaron cum omni vulgi multitudine: et congregaverunt primo die mensis secundi recensentes eos per cognationes et domos ac familias et capita et nomina singulorum a vicesimo anno et supra: sicut preceperat dominus moysi. Numeratique sunt in deserto synai de ruben primogenito israhelis per generationes et familias ac domos suas et nomina capitum singulorum omne quod sexus est masculini a vicesimo anno et supra procedentium ad bellum: quadraginta sex milia quingenti. De filiis symeon per generationes et familias ac domos cognationum suarum recensiti sunt per nomina et capita singulorum omne quod sexus est masculini a vicesimo anno et supra procedentium ad bellum: quinquaginta novem milia trecenti. De filiis gad per generationes et familias ac domos cognationum suarum recensiti sunt per nomina singulorum a viginti annis et supra omnes qui ad bella procederent: quadraginta quinque milia sexcenti quinquaginta. De filiis iuda per generationes et familias ac domos cognationum suarum per nomina singulorum a vicesimo anno et supra omnes qui poterant ad bella procedere recensiti sunt: septuaginta quattuor milia sexcenti. De filiis isachar per

PAGE FROM GUTENBERG'S 42-LINE LATIN BIBLE

through China's typography, it will be well to recapitulate some of the points at which this Chinese influence is likely to have made itself effective.

1. Through paper. Here we are on clear historic ground. Paper was an invention fully perfected in China, transmitted through the Islamic world. It served as the foundation for the invention of printing.

2. Through playing cards. Playing cards were introduced into Europe from China, either directly or indirectly, during the latter part of the fourteenth century. Block printing, and with it the production of playing cards by printing, had begun by about the end of that same century, if not earlier. That among the first objects printed in Europe were these bits of cardboard whose use is known to have been at that time recently introduced from China is at least suggestive.

3. Through image prints. The earliest European block prints that have come down to us are religious pictures, which, while European in design, yet in subject matter and purpose, in ink and in technique, suggest the prints of Central Asia.

4. Through the great number of books printed in China. Men who returned from China to Europe, especially ecclesiastics, cannot have failed to spread reports of the great diffusion of books in that country, which far exceeded that in Europe. Such reports, coming to Europe at a time of intellectual awakening, must have been an incentive to invention. Even if the reports were vague and conveyed only hazy information as to method, this dimly seen background of achievement in another land must have added to that favorable atmosphere in which the art of printing was bound sooner or later to be discovered. There may here be seen a direct but ill-defined connection between Chinese *block printing* and European *typography*, two processes which, however different in technique, were similar up to a certain point in cultural result.

5. To these may be added the possibility, though not the probability, that the actual method of typography in use in the Far East had in some way been reported in Europe.

Thus we see that no categorical answer to the question whether or how printing came from China can be given. The best that can be said is: that the introduction of paper from China is certain; that the influence of Chinese block printing on European printing rests on such strong circumstantial evidence as to be accepted with a reasonable degree of certainty; that little or no reliable evidence has yet been found to show that the *typography* of China or Korea influenced that of Europe.

More significant than the evidence for or against the influence of China on European printing and also more certain, is the evidence which this inquiry affords of the parallelism of the human mind in East and West. Here there can be no controversy. Those who write of Eastern inscrutability, who believe that the Chinese are a mysterious people with mental processes altogether different from our own, will here find food for thought. In China as in Europe the use of finely engraved seals began before the Christian era. In China as in Europe the desire for ornamentation led early to printing on textiles. At both ends of the world the religious impulse, reinforced in the monasteries, led to the beginnings of block printing, and in both cases the play impulse as represented by playing cards had also its part. In both China and Europe, when civilization reached the point where printing on a larger scale was needed, printing came, making the diffusion of books and of education general. That it came earlier in China than in Europe is due to the fact that China recovered more quickly from the Dark Ages and developed earlier a civilization that was ready for the diffusion of books. Finally both China and Europe evolved elaborate and ingenious schemes for the use of movable type. That block printing finally prevailed in China, while typography prevailed in Europe is due to the difference between Chinese and European script. Given similar conditions, the two ends of the world have done similar things. Intercourse there undoubtedly has been—at certain points we have been able to trace it. But the great outstanding fact that has been shown by this inquiry is the parallelism in the working of the human mind on

the two sides of the world, a parallelism that has been manifest at every stage in the history of printing.

Of all the world's great inventions, that of printing is the most cosmopolitan and international. China invented paper and first experimented with block printing and movable type. Japan produced the earliest block prints that are now extant. Korea first printed with type of metal, cast from a mould. India furnished the language and the religion of the earliest block prints. People of Turkish race were among the most important agents in carrying block printing across Asia, and the earliest extant type are in a Turkish tongue. Persia and Egypt are the two lands of the Near East where block printing is known to have been done before it began in Europe. The Arabs were the agents who prepared the way by carrying the making of paper from China to Europe. Paper making actually entered Europe through Spain, though imported paper had already come in through the Greek Empire at Constantinople. France and Italy were the first countries in Christendom to manufacture paper. As for block printing and its advent into Europe, Russia's claim to have been the channel rests on the oldest authority, though Italy's claim is equally strong. Germany, Italy and the Netherlands were the earliest centers of the block printing art. Holland and France, as well as Germany, claim first to have experimented with typography. Germany perfected the invention, and from Germany it spread to all the world. Great Britain and the United States, the two countries that to-day do the bulk of the world's printing, are the two great nations of the world that lay no claim to having had a part in the invention, at least in its early stages, and have contented themselves with such later developments as the power press and the linotype.

NOTES

NOTES

INTRODUCTION

1. For full quotation from Jovius, see chapter 16, note 9.
2. Meerman's authority is "The *Historia Sinensis* of Abdalla, written in Persic in 1317, which speaks of it [printing] as an art in very common use." The reference is probably to Banakáti, whose work is quoted from that of Rashid-eddin. See chapter 17, note 19. For this and other early European statements about Chinese printing, see Isaiah Thomas, *The History of Printing in America*, Worcester, Massachusetts, 1810, page 72.
3. See Bibliography.
4. A very brief but accurate notice of the invention of printing in China is contained in a book entitled *China* by J. F. Davis (J. F. Davis, *China*, London, 1857, vol. 2, pp. 173–174). I believe the same passage occurs in an earlier edition of the work published in 1836.
5. Asakura Kamesō, Yeh Tê-hui and Liu An. See Bibliography.
6. The magnitude of the work has made it impossible to carry *every* quotation from Chinese encyclopedia or other source book back to its ultimate source, as in the interest of scientific accuracy the writer would have preferred to do. In key passages, however, on which the framework of the history depends, every effort has been made thus to get back to the original statement and to compare variant editions. In other cases, where use has been made of secondary sources, and in the very few cases where the translations of other European scholars have been accepted, the secondary source as well as the original has been noted. It should be observed that the Chinese encyclopedias and other source books used consist almost wholly of verbatim quotations from earlier works rather than paraphrases or summaries, and that, while the possibility of copyists' errors is not thus altogether excluded, this method greatly diminishes the likelihood of such error.
7. Tai T'ung (戴 侗), *Liu-shu-ku* (六 書 故), concluding paragraph. Translation from L. C. Hopkins, *The Six Scripts*, Amoy, 1881, pp. 60–61. The quotation from Confucius is from the Analects, book 14, chapter 9.

CHAPTER I

THE INVENTION OF PAPER

1. For descriptions of paper napkins and toilet paper in China, written by Arab travellers in the ninth century, see for paper napkins, M. Reinaud, *Relation des voyages faits par les Arabes et les Persans dans l'Inde et dans la Chine*, Paris, 1845, pp. 24 and 38; and for toilet paper, Eusebius Renaudot, *Anciennes relations des Indes et de la Chine de deux voyageurs Mohametans*, Paris, 1718, page 17.
2. Wall paper also is a comparatively recent contribution of China to European culture, having been introduced directly from China about the middle of the sixteenth century by Spanish and Dutch traders. See *Grande Encyclopédie*, art. *Papier*. For india paper and *papier maché* see Encyclopedia Britannica, art. *Paper*.
3. There is a tradition that grew up in the T'ang Dynasty and is still held by certain writers, both Chinese and Western, that during the Chou Dynasty writing was done as a rule by cutting in the bamboo or wood with a knife. Chavannes (see Bibliography) discusses in full this theory and the reasons why it cannot be held.
4. Silk was used as a writing material in Mesopotamia in the early Mohammedan period before the Arabs there started to use papyrus rolls. For this purpose white silk was dipped in gum and polished with a shell. See Grohmann, *Corpus Papyrorum Raineri III., Series Arabica I. 1, Allgemeine Einführung in die Arabischen Papyri*, Vienna, 1924, page 59 and footnote 2. Grohmann suggests the likelihood that this use of silk was derived from India, which seems quite possible; but as the silk both of India and of Mesopotamia was imported from China, it would seem likely that the art of preparing silk for a writing material both in India and in Mesopotamia went back originally to a Chinese origin.

   While in China the use of silk as material for writing quickly gave way to paper, silk remained the usual material for painting for several centuries and has never been entirely displaced.
5. (紙) This character is now the ordinary word for paper. The definition of the word in the *Shuo-wên*, finished about the time of Ts'ai Lun's invention, would indicate that to that writer it meant a form of paper or near-paper made of silk. The passage under consideration

would seem to indicate that the word had also been applied to the pieces of silk fabric used for writing. This word has the silk radical as indication of material. Later the same word with the cloth radical substituted for that of silk is frequently used (帋), but it is the form with the silk radical that has survived and is in common use to-day.

6. *Hou-Han-shu* (後漢書), book 180, section 68, subsection entitled 蔡倫傳.
7. For continuation of the biography of Ts'ai Lun, see translation in Blanchet, *Essai sur l'histoire du papier*, pp. 13–14.
8. For fuller description of this paper see chapter 11.
9. The place where writing on wood continued longest was Miran, a Tibetan fort, which appears to have been particularly backward. Writing on wood continued at Miran—parallel with the use of paper—down to the eighth or ninth century. *Serindia*, pp. 348, 462. In most places in Turkestan it ended several centuries earlier.

CHAPTER II

THE USE OF SEALS

1. 印, defined in the *Tz'ŭ-yüan* Encyclopedia as "everything that has fine marks to be impressed on something else."
2. The laundryman's check goes back also in its origin to the *ch'ou* (籌), or *mei* (枚), an ancient form of counter. But the fitting together of torn edges goes back to the practice here described.
3. The system of passports in use in Han times seems to be a continuation of this custom, and to give a possible hint also of another form of proto-printing. They are thus described in the *Tz'ŭ-yüan* Encyclopedia (section 未, p. 5): "*Fu-chieh* were of bamboo, one foot two inches in length. Iron was used to imprint characters on them. On them was noted the age, surname, given name and facial description of the owner. . . . If on examination the two halves fitted, the owner was allowed to proceed. The *Chou-li* states, 'to go through the gates (i. e. over the border) it is necessary to have a *fu-chieh*'."
4. The date at which the use of seals began has been warmly debated by Chinese antiquarians. The weight of evidence would seem to

indicate that the use of *private* seals began somewhat before the end of the Chou Dynasty and that the first *state* seal was that of Ts'in Shih Huang. Kan Hsü (quoted in *Yin-tien*, 6:1) carried the use of seals back to pre-Chou times. But this is an extreme view, not supported by others. The oldest authority on the subject is Wei Hung, (衛宏) who lived in the first century, A.D. (Giles, *Biog. Dic.*, No. 2277). His statements are, "Before the Ts'in Dynasty, seals one inch square were made of gold and silver. When Ts'in Shih Huang received the jade from Ho of Chin, he made a seal of jade. . . . It was called the seal of inheritance of the Empire." (Quoted in *Tz'ŭ-yüan*, section 午, p. 8.) "Before the Ts'in Dynasty everyone who wished used metal and jade for seals." (Quoted in *Ko-chih-ching-yüan*, 41:1.) Wu-ch'iu Yen and Ma Tuan-lin, both of the Yüan Dynasty, deny that seals were used in the Chou Dynasty. Their statements can be reconciled with those of Wei Hung, if the former are regarded as referring to official seals, and if Wei Hung's statements are interpreted as meaning that the use of private seals began *just slightly* before the beginning of the Ts'in Dynasty. The statements of Wu-ch'iu Yen and Ma Tuan-lin are as follows:

"In the time of the Three Dynasties (2205–255 B.C.) there were no seals. Scholars should carefully note this. Although the *Chou-li* speaks of an object called *hsi-chieh* (璽節), and mentions an official as having charge of examining and authenticating this object, and although in the commentary it is stated that the *hsi-chieh* was a seal, actually it was rather a scepter held in the hand. On the right side were cut characters, as in the seal of Ts'in Shih Huang, but it was not possible to make an impression with it. If anyone had tried to make an impression, it would have been found that the impression was reversed. The ancients used this object for authentication. They were not interested in having the characters reversed. They were so simple in their ways. What the 'six seals' of Su Ts'in in the *Chan-kuo* period were is uncertain. Huai-nan-tzŭ says that Confucius called Tzŭ-kung and gave him the seal of a great general. But this is not to be taken literally." *Hsüeh-ku-pien*, (學古編) by Wu-ch'iu Yen (吾邱衍), quoted in *T'u-shu-chi-ch'êng*, 144:2.

"Before the (end of the) Three Dynasties, there were no seals. When the emperor gave orders, he took a piece of jade or of bamboo

and broke it, giving half to the minister or general to whom the order was given. This served as a special proof of the genuineness of the order. Also when a man was granted a title of nobility, such a half piece of jade was given him as proof, it being required that his half fit exactly with the half in the emperor's possession. When times became more complex, it became necessary to guard against falsification and seals were the result." From *Wên-hsien-t'ung-k'ao* (文獻通考) by Ma Tuan-lin (馬端臨), quoted in *T'u-shu-chi-ch'êng*, 144:1.

The *Shuo-wên* (a dictionary compiled about A.D. 100) defines a seal (印) as "an article for authentication (信) held by an official (執政)." Tuan Yü-ts'ai, in his commentary on the *Shuo-wên*, gives the following hint as to the origin of seals and as to how their use became more extended during the Han Dynasty, "The ancients wrote on bamboo slips and wooden boards. Whenever they wished to send any information to a distance, the slips or boards were wrapped in a piece of silk and impressed with seal clay (璽泥). When silk became the ordinary writing material, the use of seals (印) became widespread." 說文解字註 (Commentary on the Shuo-wên) by 段玉裁 (Tuan Yü-ts'ai), folio 9, 印部.

From an examination of the conflicting evidence, it would seem that the use of private seals probably began slightly before the beginning of the Ts'in Dynasty (255 B.C.), and that the first imperial seal was the famous jade seal of Ts'in Shih Huang.

5. These documents were found at Niya. The writing is in the Kharoshti script. The site where they were found was abandoned toward the close of the third century, A.D. See *Serindia*, pp. 224–231.
6. A possible hint of the use of something analogous to seal impressions in India not long after Alexander's conquest is contained in Hsüan Tsang's narrative of an impression of a tooth in "purple clay" (red wax?) by Kumala, the faithful son of Asoka. See *Si-yü-chi* (西域記), folio 3, page 10 (Nanking edition).
7. Many seal impressions of the Han Dynasty have been found in north China, and a collection of them has been published under the title *Fêng-ni-t'u-k'ao* (封泥圖考) or *Record of Clay Seal Impressions*.
8. *Yin-tien, chüan* 6, pp. 1–4.
9. The use of seal impressions in wax or some similar substance, rather

than inked impressions, has been almost universal in the Roman Empire and in Europe. There have, however, been exceptions, and seal impressions made by what we may call the Chinese method were made even in classical times. There is in Berlin a red ink stamp on papyrus that dates from A.D. 85, and is quite similar to the seal impressions that began at a later date in China. It was found in Egypt. (Berlin, Altes Museum, Papyrus Ausstellung, No. P 6867). The use of red ink stamps in Egypt never altogether died out, as is witnessed by a stamp on linen in the Erzherzog Rainer collection in Vienna, dating from between 1250 and 1257. However the use of such seals in Europe and the Near East was very rare, and played no such part as in China in the ushering in of block printing.

10. The fact that Han seals were impressed in clay and not with ink is attested not only by finds in Turkestan and north China, but by documentary evidence. The authorities quoted below (note 11) as to the beginning of inked impressions all imply that earlier impressions were of a different sort. A quotation in *Yin-tien* records the fact that the "clay of Lan-ch'ing (*Lan-ch'ing-chih-ni*) was brought from the country of Fu-i, and was used during Wu-ti's reign (B.C. 140–86) for the sealing of state documents." The poetic expression for imperial edict used by Li Po and others, "purple clay document," retains in the language a memory of a former practice, the use of "purple clay" by the emperor being perhaps a step in the transition to the cinnobar or red ink of later times. It is only fair to state that certain Chinese scholars seem to ignore the fact that seals were ever different from those of their own day. A book entitled, "History of Seals" (印史), written probably in the Yüan Dynasty, which purports to give facsimiles of the seals of all great men from Ts'in Shih Huang down, gives them all in red and all in approximately the same form. The *Ch'i-hsiu-lei-k'ao* of the Ming Dynasty (a book not altogether noted for its accuracy) even describes circumstantially the red seal impressions of the Han Dynasty. (Quoted in *Ko-chih-ching-yüan*, 41:1). Those who take the opposite view are historians of greater reputation for accuracy and their statements are confirmed by the finds in Turkestan and north China.

11. "The seals of the Six Dynasties (A.D. 220–589) were changed according to the style of the times. Gradually they began to use seals with red characters (on white ground) and white characters (on red ground).

The change in the style of character began at this time. . . . The seals of the T'ang Dynasty followed those of the Six Dynasties and the characters were made in red." *Yin-tien, chüan* 6, pp. 1–2. This is the final conclusion of the author of *Yin-tien* (see Bibliography) based upon a multitude of earlier authorities that are quoted. *Yin-tien* is a very carefully written critical history of seals. Among the authorities quoted is Kan Hsü, who writes, "No red impressions from Han times have been found. When we come to the Six Dynasties and the times of T'ang and Sung, those red impressions were valued"; and again, "Among ancient seal impressions there were some that were partly red and partly white. These are all from after the Han Dynasty." It is evident that the author of *Yin-tien* believes, on the basis of his various authorities, that the change came during the latter part of the period of the Six Dynasties rather than the earlier part, and I have therefore set as a tentative date the fifth and sixth centuries.

So far as Turkestan finds are concerned, the transition might have taken place at any time between the beginning of the fourth century and the end of the seventh. In general Han seals are in clay, T'ang seals in ink. No accurately dated seals of the transition time have been found. In this case, while the evidence of archeology and of tradition coincide, the latter narrows the date down more exactly than does the former.

12. These documents are in the Tibetan language and were found at Miran, which seems to have been a back eddy, far behind other parts of Turkestan in beginning to use paper. Both the documents on wood and those on paper seem to date from the eighth or ninth century, long after wooden stationery and clay seal impressions had disappeared from other communities. See *Serindia*, pp. 348 and 462.

13. Ko Hung, *Pao-p'o-tzŭ*, chap. 4. Translation from De Groot, *Religious System of China*, vol. 6, p. 1049.

14. There are a number of passages indicating that the Taoist charm seals were made of wood. Among them are the following, one referring to the Han Dynasty, the other to early T'ang:

"In the month of midsummer, they placed at the gates and doors seals of peach wood, six inches in length and three in breadth, inscribed in colors with the words, 'Let the law be obeyed'." History of the Han Dynasty (*Hou-Han-shu*), 15:1. Translation from De Groot, vol. 6, p. 1049.

"The Taoist priests cut seals out of the heart of date wood. They are four inches square." Hsü Chien, in the T'ang Dynasty encyclopedia entitled *Ch'u-hsüeh-chi*, quoted in *Ko-chih-ching-yüan*, 41:1.

15. Ko Hung, writing in the fourth century, insisted on wooden charms being worn as amulets by people travelling in mountainous country, stating that "they should preferably be written with red cinnobar on planks of peach wood." De Groot in quoting this adds, "At least from Ko Hung's time, man has painted or written charms with the carnation color of cinnobar or *tan*, this substance having always been used by emperors or their proxies to mark their decisions as authentic." De Groot, vol. 6, pp. 1047–1048. (The section quoted from Ko Hung is from *Pao-p'o-tzŭ*, section 17). The fact that the Taoist charm always used whatever form would best indicate authority makes it virtually certain that, when red ink seal impressions came into use, the Taoist charm seals followed suit. The very idea of connecting the seal with the charm was to indicate authority. "A charm without a seal is like an army without a commander," is a favorite Taoist saying (De Groot 6:1048). There is clear evidence that in the early days when characters written on a broken bamboo slip constituted the evidence of authentication, the Taoist charm was such a broken slip of bamboo. (See De Groot's account of the various meanings of the character 符, vol. 6, p. 1034). When seals came in with their clay impressions, the Taoist charm was a clay seal impression. When red ink of cinnobar became the vogue for authenticating imperial documents, Taoist charms—at least the written ones—had red ink. And finally when this red ink of cinnobar came to be used for the impressing of seals, there is every reason to suppose that the big wooden seals of the Taoists—those seals of date wood four inches square described by Hsü Chien—were impressed on paper with red ink of cinnobar. When actual proof of this can be found, either from Chinese records or from under Turkestan sands, it will be possible to state with confidence that the world's first block printers were the Taoist charm makers of China. Liu Pin's statement (see chapter 8) of the books that he saw for sale in Szechuen in 883 adds weight to this view.

16. See chapter 7.

17. See chapter 19.

18. Another early form of authentication by means of inked impression was the finger print. This method of identification, which has recently

come into use in the West, was in use in China probably from the T'ang Dynasty and was clearly described by an Arabic writer, Rashid-eddin, during the Mongol period. For Rashid's description and for bibliography on the subject, see Henry Yule, *Cathay and the Way Thither*, Cordier edition, vol. 3, pp. 123–124.

CHAPTER III

RUBBINGS FROM STONE INSCRIPTIONS

1. The word used is *mu-hsie* (摹寫). The regular word for rubbing *t'a* (搨), did not come into use until the T'ang Dynasty. The view is sometimes held that the word 摹 as used in the Han Dynasty was the equivalent of 搨, but it is by no means certain.
2. Hou-Han-shu (後漢書), section 90 (下), page 8, biography of Ts'ai Yung.
3. There are a number of objections to this traditional view according to which the making of rubbings began in the second century. Perhaps the most important of these objections is the question what kind of ink could have been used. It seems more probable that the practice began not so very long before the date of the earliest rubbings found—perhaps in the sixth century.
4. This rubbing bears the date 653/4 as the time when a certain person saw it, and the text is a poetical work composed and written by the emperor T'ai Tsung (627–649). The copy for the inscription is written by the celebrated writer and calligrapher, Liu Kung-ch'uan. See Pelliot, *Une bibliothèque mediéval retrouvée au Kan Sou*, Bulletin de l'Ecole Française d'Extrême Orient, vol. 8, p. 527.
5. According to the official history of the T'ang Dynasty (唐書百官志) these officials were known as *t'a-shu-shou* (搨書手).
6. Portions of another book of rubbings, cut and mounted in leaves, were found at Tun-huang. It consists of rubbings from the *Hua-tu-ssŭ-pei* (化度寺碑), of which the original was written by Ouyang Hsün (歐陽詢) in the beginning of the T'ang Dynasty. See *Serindia*, page 918, also plate CLXIX, ch. 1080. Some of the leaves of this book are in the Stein collection in London and some in the Pelliot collection in Paris.
7. Literary evidence of lithograph books from stone blocks prepared

specially for the purpose goes back only to the tenth century. The clearest record is that of 993, quoted in note 9. There is however probable earlier reference by Cho Po-hsiu, quoted by the thirteenth century writer Chou Mi (周密) in the book entitled *Yün-yen-kuo-yen-lu* (雲烟過眼錄): "The last emperor of the Later T'ang Dynasty (934–936) ordered Hsü Hsüan to have cut in stone such original manuscripts and old and new rubbings as existed from the earlier dynasties. So we must put the beginning of the making of rubbings earlier than the *Shun-hua* period." *Ko-chih-ching-yüan* (格致鏡原), book 39, folio 6. Julien (Journal Asiatique, 1847, page 510) and Pauthier (Mémoires de la Société des Etudes Japonaises, 1887, vol. 6, page 186) apparently find literary evidence of lithograph books (which they say were cut on the stone in reverse) in the year 904, but they do not quote their authority for the statement. The only evidence of lithograph books in the ninth century is the actual discovery of these books at Tun-huang.

8. *Ts'ê-fu-yüan-kuei* (册府元龜), written about 1005 (quoted in Journal of Sinological Research, Jan., 1923, page 139). See chapter 9, notes 7 and 8.

9. These volumes (there are ten of them) are known as *fa t'ieh*. Ou-yang Hsiu (1007–1072) thus describes the production of the *fa t'ieh* of 992, "In the troubled times at the end of the T'ang Dynasty, the imperial graves were broken into by robbers, and the books and pictures that had been kept in them were torn from their rolls. Gold and jewels were taken and the books thrown away. Thus the autographs of great men of Tsin and Wei times came into the market. In the time of T'ai Tsung (976–998) these were bought up and put into ten books in order that they should be reproduced and passed on to posterity. These volumes were presented to the high ministers of state, and are the *fa t'ieh* now in possession of various nobles and ministers." According to Ts'ao Chao, in the work entitled *Ko-ku-yao-lun*, these *fa-t'ieh* were published both in block print and in lithograph: "T'ai Tsung of the Sung dynasty searched out the autographs of men of former times and in the period *Shun-hua* (990–995) ordered the secretary Wang Chu to print them in nine books. These were cut in blocks of date wood, and placed in the private cabinet of the emperor.—In the third year of *Shun-hua* (992) an edict was issued to cut them

in stone, and by use of *Chêng-hsin-t'ang* paper and *Li-ting-kuei* ink to make rubbings. They were made in such a way that the hands were not soiled by the ink. Those that have no marks of repair by silver nails are the earliest and the best." (These quotations are taken from the *Ko-chih-ching-yüan* Encyclopedia, section 39, folio 6, (古帖).

10. That the use of the lithograph for preserving calligraphy had begun at an earlier date than this is indicated by the Tun-huang booklet described in note 6.

11. The *Ko-chih-ching-yüan* Encyclopedia devotes ten pages to a description of the lithographic texts produced in the Sung Dynasty and three to counterfeits of these Sung lithographs (see Bibliography). According to Julien, the *Chih-pu-tsu-chai-ts'ung-shu* (知不足齋叢書) describes "all the ancient inscriptions and all the autographs of famous men that were printed by this method between the years 1143 and 1243."

CHAPTER IV

THE DYNAMIC FORCE THAT CREATED THE DEMAND FOR PRINTING—THE ADVANCE OF BUDDHISM

1. It seems quite possible, as already pointed out, that this Buddhist activity was preceded by a practice among Taoist charm makers that was very closely akin to block printing. After the period of more or less primitive Buddhist printing, the next great step forward was the printing of the Confucian Classics by Fêng Tao in 952, which marked a new stage in the art. Each of China's three religions seems, therefore, to have had its part, but the greatest part, at least during the early centuries, was that of Buddhism.

CHAPTER V

THE SIGNIFICANCE OF BLOCK PRINTING IN CHINA, THE INK, AND THE METHOD USED

1. At least fifteen books in English, French and German have appeared in recent years—many of them handsome *de luxe* editions—on the

Chinese and Japanese wood cut (especially the color print) regarded as a fine art—a rather startling fact when it is remembered that the whole bibliography in European languages on the Chinese invention of printing consists of three magazine articles and one short pamphlet.

2. T. L. De Vinne, *The Invention of Printing*, New York, 1876, pages 39–41.
3. What this *ch'i* was is uncertain. The character (漆) pictures drops of water falling from a tree, and means to-day the varnish made from the sap of the lacquer tree. With this varnish a pigment made from iron sulphate is often used, and it seems reasonable to suppose that some such material constituted China's ancient ink. Such an ink would never have been satisfactory for block printing.
4. There was another form of ink—red ink—that had been known in China since the Han Dynasty and probably earlier, that might have been satisfactory for printing. This is made of red oxide of mercury or cinnobar, which is mined in the province of Kweichow. It is still used for taking impressions from seals, a practice that may have begun earlier than the invention of *encre de Chine* (see chapter 2). The difficulty of using cinnobar for printing is its rarity and consequent expense.
5. "In the most ancient times a bamboo twig was dipped in lacquer for writing. In mid-ancient times there was an ink stone (墨石) from which ink could be produced by rubbing. In the time of the Tsin and Wei Dynasties, ink in blocks was first made. It was made from the smoke of lacquer and from lamp black produced by burning pine wood. So the people of the Tsin Dynasty commonly used a concave stone for rubbing the ink stick and collecting the dissolved ink." *Tung-t'ien-ch'ing-lu* (洞天清錄) by Chao Si-ku (Sung Dynasty).

"In ancient times there were two forms of ink, one from lamp black of pine and one from 'ink stone.' After the Tsin and Wei Dynasties we hear no more of 'ink stone,' as the making of ink from lamp black became general." Ch'ao-shih Ink Classic. Both the above translations are made from excerpts in the *Ko-chih-ching-yüan* Encyclopedia, book 37, folio 20. What 'ink stone' (墨石) was is uncertain. Its present meaning is bitumen.

The name Wei Tang as the inventor of ink is given on the authority

of Liu Yu of the Yüan Dynasty quoted in the *Tz'ŭ-yüan* Encyclopedia under the word 墨.

This date for the invention of lamp black ink is not uncontested. Hsün Hsiu, in his preface (written in the third century, A.D.) to the Bamboo Books, uses the word *mo* (墨) of the ink with which those books were written. It seems probable however that, unless the word is an interpolation, it refers to the ink that other writers call *ch'i*.

6. Cf. John F. Davis, *China*, vol. 2, page 180; S. Julien and P. Champion, *Industries anciennes et modernes de l'Empire chinois*, Paris, 1869, pp. 129–140.
7. Black ink of lamp black and red ink of cinnobar were both used in Egypt from the dynastic period down through Greek, Roman and Byzantine times, as well as later. The usual ink for writing on papyrus was made much like the Chinese ink, and like Chinese ink was kept in a dry condition.

   There is a curious parallel between the use of cinnobar for imperial decrees in the early Byzantine empire and in China. The restriction of the use of cinnobar to the emperor began in Constantinople about A.D. 470.
8. This description is taken in the main from John F. Davis, *China*, London, 1857, vol. 2, pp. 176–177. I have preferred to make use of this early description, as the method here described is less likely to be influenced by changes brought from the West.

CHAPTER VI

THE BEGINNINGS OF BLOCK PRINTING IN THE BUDDHIST MONASTERIES OF CHINA

1. See chapters 8 and 14.
2. See chapter 3.
3. See *Serindia*, index, *Stencil*, also plates XCIV and CXIII.
4. See chapter 20. Also *Serindia*, index, *Silk, printed*, and plates CXXII, etc.
5. This forms the base or frame on which one of the block prints in the British Museum is pasted. The pattern is of ellipses forming a net, printed in dark blue on a light blue ground. There are two fragments, each about six inches by two.

6. The impressions on the rolls in the British Museum range from 1.5 to 2.8 inches in height and from 1.2 to 1.8 inches in width. Those in Paris and Berlin are approximately the same.
7. A wooden stamp found by Pelliot at Kutcha in E. Turkestan dates—according to the deposit in which it was found—from not later than 800. That the use of these stamps had spread as far west as Kutcha by 800, indicates a very early date for China itself. Metal stamps of uncertain date have been found at Turfan.
8. See chapter 5 for description of the method of Chinese block printing.
9. 4 x 3.4 inches. Only the bare outline is printed. Details are filled in by hand in colors. The workmanship of this sheet of heads bears a striking resemblance to the most primitive European block prints.
10. Size 13 x 20 inches.
11. This rubbing dates from the reign of T'ai Tsung, 627–649. See chapter 3.
12. Before 800. See note 7, above.
13. Stanislas Julien in 1847 (Journal Asiatique, series 4, vol. 9, pages 505–507) was the first to introduce to European readers the view that printing was carried on in China in the year 593, and from Julien the statement has found its way into the Encyclopedia Britannica and most histories of China in Western languages. The origin of this theory is interesting. Julien quotes it from the *Ko-chih-ching-yüan* Encyclopedia (格致鏡原), published in 1735. The statement in this encyclopedia is quoted from Lu Shên (陸深) and from the book *Pi-ts'ung* (筆叢). Lu Shên lived from 1477 to 1544 (Giles, *Biog. Dict.*, No. 1427). His statement, contained in his book *Yen-hsien-lu* (燕閒錄), is: "Under the emperor Wên Ti of the Sui Dynasty, in the year 593, the eighth day of the twelfth month, on orders from the emperor, all neglected *hsiang* (像, the word means either images or pictures) and scattered *ching* (經, Classic texts or *sutras*) were carved and collected (雕撰). This is the beginning of the printing of books. It was thus earlier than Fêng Ying-wang (i. e. Fêng Tao, 881–954)." This reference of printing to Wên Ti's reign is clear and explicit and indicates that the theory went back as far as the sixteenth century. The statement in the book *Pi-ts'ung* (full title of book *Shao-shih-shan-fang-pi-ts'ung*, 少室山房筆

叢, by Hu Yin-lin, 胡應麟, written near the end of the Ming Dynasty) is apparently based on that of Lu Shên. It reads simply: "Block printing had its birth at the beginning of the Sui Dynasty, it expanded greatly under the T'angs, took a leap forward under the Five Dynasties and finally came to its fullest development under the dynasty of Sung." Against these two statements is the weight of the older Chinese tradition (the very form of Lu Shên's statement shows that he is propounding something contrary to the generally received opinion), and also the explicit authority of at least three prominent writers of the Sung Dynasty, whose statements follow:

"Under the T'ang Dynasty block printing, though carried on, was not fully developed. Under Fêng Ying-wang (Fêng Tao) first the Classics and then all the ancient canonical works were printed." Shên Kua (沈括), 1030–1093, *Mêng-ch'i-pi-t'an* (夢溪筆談), book 18, section 9 (edition of 1631).

"Before the T'ang Dynasty all books were manuscripts, the art of printing not being in existence." "According to popular report the cutting of blocks and printing of books from them was commenced by Fêng Tao. This is not the fact. . . . Printing certainly existed in the T'ang Dynasty, but I apprehend it was not equal in workmanship to the present." Yeh Mêng-tê (葉夢德), c. 1130, as quoted by Ma Tuan-lin (馬端臨), *Wên-hsien-t'ung-k'ao* (文獻通考), c. 1319. Tr. by Meadows in Miscellanies of the Philobiblon Society, vol. 6, pp. 15, 16.

"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." Chu Yü (朱昱), *I-cho-liao-tza-chi* (猗覺寮雜記), vol. 2, folio 61 (edition of 1774).

In the face of such conflicting evidence it is necessary to discover where Lu Shên got his information, which has so remarkably dominated European writings on the subject. There is apparently nothing about printing in the annals of the Sui Dynasty. In the Buddhist *Tripitaka*, however, in the volume entitled *Li-tai-san-pao-chi*, (歷代三寶記) by Fei Ch'ang-fang (費長房) (Kyoto edition, *t'ao* 30, vol. 7, chap. 15, folio 666), stands the passage from which Lu Shên's statement is a word for word (though abbreviated) quotation. This section of the book was written in the year 597, only four

years after the event related. The last two sentences of Lu Shên's statement (from "this was the beginning of the printing of books" to the end) is not quotation but is Lu Shên's comment. A critical examination of the whole passage, without this gloss and in connection with the context, leaves little doubt that printing is not referred to at all, the true interpretation being that damaged images were re-carved and that scattered *sutras* were collected. This interpretation of the passage was first proposed by a Chinese writer in the book *Shu-yin-ts'ung-shuo* (書隱叢說) ("雕 refers to images, 撰 to *sutras*, this is not the beginning of printing"), and accepted by the Japanese investigator, Kamesō (日本古刻書史, p. 3). Arthur Waley of the British Museum recently came independently to the same conclusion and published the arguments for it in the New China Review (see Bibliography). In his *Introduction to the Study of Chinese Painting* (page 87, footnote), Mr.Waley has correctly quoted me as saying that while Julien forced the meaning of the passage which he translated, his general inference with regard to date was perhaps correct. Since my conversation with Mr. Waley in 1922 on which this statement is based, further study has convinced me not only that Julien's interpretation is forced, but that his date is in all probability too early and that a century or more later would be more correct.

In *Shu-lin-ch'ing-hua* (書林清話) by Yeh Tê-hui (葉德輝), vol. 1, folios 19–20, there is a full discussion of Lu Shên's interpretation of Fei Ch'ang-fang's statement, with quotations from Chinese and Japanese authorities. The author's conclusion is that Lu Shên's interpretation is incorrect and that there is no reference to printing.

Terrien de Lacouperie (*Beginnings of Writing in Central and Eastern Asia*, pp. 66 and 190; *Western Origin of Early Chinese Civilization*, p. 345) has pointed out a number of still earlier passages which he has interpreted as references to printing. An examination of the passages concerned, however, shows that they refer not to printing but to the making of stone inscriptions.

14. Certain of the later emperors of the T'ang Dynasty were completely under the influence of Taoist superstition, and to this was due the persecution of Buddhism that lasted from 845 to 859. In 859 Buddhism was restored to its former position.

CHAPTER VII

THE EMPRESS SHOTOKU OF JAPAN AND HER MILLION PRINTED CHARMS. *c.* A.D. 770

1. Chinese literature began to enter Japan as early as 540, but Chinese civilization did not begin to make a strong impression till the beginning of the seventh century. Four Japanese students were sent to China in 608 to study, and on their return were instrumental in bringing about the great reforms of 645.
2. P. Y. Saeki, *The Nestorian Monument*, Tokyo, 1913, p. 145.
3. *Nihongi*, book 23, page 8. For this and other information about Japanese seals, see Hans Spörry, *Das Stempelwesen in Japan*, Zürich, 1901, pages 7–9. This passage from the *Nihongi* dates from about 720.
4. Commentary of *Shoku-Nihongi-Kosho.*
5. For full description of these printed textiles, together with bibliography of Japanese books on the subject, see Kamesō, page 4. See also Toyei Shuko, *Illustrated Catalog of the Shoso-in Treasury at Nara*, 1908, English introduction and plates.
6. *Surigonomō* (摺衣).
7. 續日本紀, published about 797.
8. See 國史大辭典, Tokyo, 1908, edition of 1916, page 1395, and last plate in supplement.
9. There is an earlier passage, dating from 751, which is claimed as a reference to block printing in Japan, but the interpretation is uncertain. The passage is as follows: "In the second year after the death of Ōtomo Akamaro (governor of the district of Tama in the province of Musashi, died 750) there was born a calf with black marks on its back. These marks had the appearance of an inscription on stone. They were interpreted to mean that Akamaro had appropriated to himself temple property and had died before punishment had overtaken him, and that as retribution he had been reborn in the form of this calf. At this all his family mourned deeply and feared, saying, 'It is a fearful thing to commit sin. Can such a crime remain without punishment?' This event was announced in a *katagi* and in the sixth month of the same year was published abroad 報(季葉楷模,

傳于諸人) in order that those who should read it should repent of their sins and do good." (日本國現報善惡靈異記, middle section). A *katagi* (楷模) in later writings means a block print. The fact that this event was only a few years before the first known block printing and that the statement here referred to was 'published abroad' by this means, has led certain Japanese writers to regard this *katagi* as a block print. The question is discussed by Kamesō, who gives the text in full.

10. There is some confusion about the exact date of this event. The Empress Shotoku ruled for the second time from 765 to 769. The account in the *Shoku Nihongi* gives the fourth year of the period 神護景雲 (770) as the date when the printing of the charms was ordered. On the other hand the temple record (東大寺要錄) gives the eighth year of the period 天平寶字 (764) as the year in which the pagodas, containing the charms, were made and distributed. To add to the confusion, the name of the ruler is here given as 孝謙, who reigned from 749 to 758. This same temple record gives 767 (first year of the period 神護景雲, cyclical year 丁未) as the date when halls for the pagodas were built in the temple. For text of the *Shoku Nihongi* statement and the temple record, see Kamesō, page 8.

Satow gives the date 764 as the year when the work was begun and 770 as the year when it was completed, and his reckoning may be taken as at least approximately correct.

11. 續日本記.
12. 東大寺要錄.
13. 摺本.
14. The romanization is Satow's.
15. Slight variations among the impressions of the same charm have led some to question the fact that the charms were actually printed from blocks at all. In answer to this, it has been correctly pointed out that such a large number of impressions would have required several blocks for each charm, as only about ten thousand impressions can be taken from a wooden block before it is worn down.
16. The spreading of the ink in some of the impressions has been thought by some to indicate that the plates were of metal. On the other hand

the variations between impressions of the same charm (see above) would indicate wood. The latter would be more in keeping with the general history of block printing, as far as it is known.

17. 無垢淨光大陀羅尼經. Japanese, *Mu-ku Jō-kō Kyō.*

CHAPTER VIII

THE FIRST PRINTED BOOK
THE DIAMOND SUTRA OF 868

1. The earliest date on any document corresponds to the year A.D. 406. The latest dated document found by Stein belongs to the period 990–994. The latest of those found by Pelliot is of the period 995–997.
2. The Diamond Sutra. Printed by Wang Chieh. Found at Tun-huang by Stein. Now on exhibition in the British Museum. This is the oldest printed book known that is dated, or of which the date can be ascertained Some undated book from Turfan or elsewhere may conceivably be older, but it seems unlikely.
3. This quotation is the sentence with which the printed text of the roll ends. The same sentence in abbreviated form appears, with the name of the *sutra*, on a little paper tab written by hand and pasted on the outside of the roll—evidently for convenience in filing.
4. Known in Sanskrit as *Prajnâ Pâramitâ*, and in Chinese as 金剛經. This *sutra* was a favorite one with Chinese Buddhists. The two most important translations into Chinese are by two of the most famous men in the history of Chinese Buddhism. The one is by the monk, Kumarajiva, who came to China as a missionary at the end of the fourth century from Kutcha in Chinese Turkestan, and the other by the Chinese pilgrim, Hsüan Tsang, who went to India and returned in the seventh century. This printed edition of 868 is the translation of Kumarajiva. The oldest printed book from Japan is a portion of Hsüan Tsang's translation. The most beautiful example of printing found at Turfan is a Sanskrit edition of this same *sutra*, printed during Mongol times (see chapter 17). The Diamond Sutra has twice been translated into English, the best translation being that of Gemmell. (*The Diamond Sutra*, by William Gemmell, London, 1912.)

5. William Gemmell, *The Diamond Sutra*, London, 1912, pp. 45–46, 61–62.

6. These are: 1 a dictionary (fragments only) now at Paris (see end of this chapter); 2 a roll, similar in form to the Diamond Sutra, written by a Buddhist abbot, and containing twenty-four examples of filial piety in verse (on exhibition in British Museum); 3 a Buddhist work (a *dharani* charm now in Paris), which can be definitely ascribed to the period before the end of the T'ang Dynasty by the fact that the character 國 does not appear, a blank being left in place of that character.

7. "In the Three Dynasties (i. e. before B.C. 255) the writings made with lacquer on bamboo were heavy and difficult to read. From the time of the Ts'in and Han Dynasties, the use of paper and ink came to be generally known. The simplification of writing as compared with the earlier method was very great. However from the Han Dynasty through that of T'ang, rolls were in use. . . . Whenever one read a roll, or wished to look up anything, it was necessary to open up the whole roll, which was very inconvenient. It was also necessary constantly to roll up the books and keep them in order, which entailed still more difficulty. At the time of the end of the T'ang Dynasty and the beginning of that of Sung, the making of manuscripts came to a sudden end and printing came in. At the same time rolls came to an end and books came in. They were easy to produce, difficult to destroy, cheap and convenient." From *Shao-shih-shan-fang-pi-ts'ung* (少室山房筆叢) by Hu Yin-lin (胡應麟), end of Ming Dynasty. Quoted in *Ko-chih-ching-yüan* Encyclopedia, book 39, folio 1.

See also quotation to the same effect from Kuei Tien-lu in *Ko-chih-ching-yüan*, book 39, folio 4. Kuei Tien-lu ascribes the beginning of the paged book to Fêng Tao, who was contemporary with this little booklet from Tun-huang.

A passage in the *History of the Sung Dynasty* (宋史), however, dates the beginning of paged books from the Sung Dynasty. This may refer to stitched rather than folded books. The statement reads: "Ancient books were in general in rolls. From Sung times come the first books that are bound and printed." *Sung-shu* (宋書), quoted in 辭源, section 辰, page 108.

8. Two other printed books, purporting to come from the T'ang Dy-

nasty, and found not at Tun-huang but elsewhere in China, are described by Liu An (pages 2–3). Of these the first is certainly a forgery and the second needs further substantiation.

9. The dated documents are as follows:

At Paris:
- 947. Single sheet with Buddhist pictures and text. Hand colored.
- 947. Another similar sheet given as votive offering by the same man. (Many copies, one of which has been presented by M. Pelliot to the Morgan Library in New York.)
- 950. A *dharani* charm, seven pages long, all printed at once from one block.
- 971. A *dharani* charm, the text of which had been corrected by Chi Hsiang, a monk from India.

At London:
- 868. The Diamond Sutra of Wang Chieh.
- 947. A single sheet similar to those of the same date at Paris, but not colored. (Three duplicate copies.)
- 947. A larger single sheet (15½ x 10½ in.) of the same sort.
- 949. A small Buddhist *sutra* in folded book form.
- 983. A large charm, mainly in a mystic form of Sanskrit that cannot be deciphered, but with also a few words of Chinese.

The eight page folded book in London and the seven page *dharani* charm in Paris are naturally classed with the single sheets, as they have the same primitive character.

10. The suggestion that the Diamond Sutra was imported from somewhere further back in China proper, while the single sheets were of local manufacture, was made by Stein.

11. There is another probable reference to printing in T'ang times, which, though obscure, may antedate that of Liu Pin. It is by Fan Shu (范攄) in the book *Yün-ch'i-yu-t'an* (雲溪友談 also known as 雲溪友議), referred to by 辭源, vol. 2, section 戌, p. 151, and quoted by Liu An, page 2. The passage is difficult of interpretation and no definite date can be assigned. Another obscure passage that may refer to printing and which may antedate Liu Pin, is noted in *Shu-ling-ch'ing-hua*, vol. 1, folio 20. These obscure passages both refer to omens and charms.

12. 柳玭. Szŭ-ma Kuang's History, in the records of the T'ang Dynasty, has the following account of Liu Pin's life: "In 902 Liu Pin was made governor of Lu-chou. The Liu family from the time of Liu Kung-cho had been held in honor by scholars and officials for its adherence in every generation to filial, fraternal and social duties. . . . The eunuchs hated him, and hence he was long punished by being kept in provincial posts. He wrote a book of admonitions for the junior members of his family." Translated by Meadows in Miscellanies of the Philobiblon Society, vol. 6, page 16.

13. Lit., *Yin-yang* (陰陽).

14. 九宮, the Nine Mansions, or arrangements of color connected with the eight trigrams.

15. What "character books" (字書) were is uncertain. They may have been copy books for learning penmanship. Again they may have been dictionaries. The fact that leaves of a dictionary dating from about this time were found at Tun-huang by Pelliot lends weight to the latter interpretation.

16. This statement is found in a book entitled *Chia-hsün-hsü* (家訓序) by Liu Pin (柳玭). It is quoted in full in the Older History of the Five Dynasties (舊五代史) in an editorial note in the edition of 1739, section (卷) 43, folio 1—a note in which many of the earliest sources on the history of printing are gathered together. It is also quoted in full in *Shu-ling-ch'ing-hua*, vol. 1, section (卷) 1, folios 18–19. In abbreviated form it is quoted by Yeh Mêng-tê (葉夢德), otherwise known as Yeh Shih-lin (葉石林), in a book entitled *Yen-yü* (燕語), written about 1130, which in turn is quoted by Ma Tuan-lin (馬端臨) in the book *Wên-hsien-t'ung-k'ao* (文獻通考), c. 1319. Other abbreviated versions are found in the *Ko-chih-ching-yüan* (格致鏡原) Encyclopedia of 1735 (book 39, folio 3) and in Liu An, page 2. European writers who have called attention to Liu Pin's statement are T. T. Meadows (Miscellanies of the Philobiblon Society, vol. 6, page 16) and Arthur Waley (New China Review, 1919).

17. 蜀.

18. From *I-cho-liao-tza-chi* (猗覺寮雜記) by Chu Yü (朱昱),

edition of 1774, vol. 2, folio 61. The full statement reads, "There was no printing before the T'ang Dynasty. Inked blocks were first used at I-chou (Ch'êng-tu) at the end of the T'ang Dynasty. During the time of the dynasty known as Later T'ang the Nine Classics were for the first time printed. All copies of the classics and the histories that were in the hands of the people were gathered together to determine the text for the cutting of the blocks."

19. 益州, the modern Ch'êng-tu.
20. 國史志.
21. 術數小學字書.
22. The *Ch'ieh-yün*, the scattered leaves apparently belong to more than one edition of the dictionary.

CHAPTER IX

THE PRINTING OF THE CONFUCIAN CLASSICS UNDER FÊNG TAO 932–953

1. The emperors of Shu during its first period of independence were Wang Chien (王建), 907–919, and Wang Yen (王衍), 919–929. During the second period they were Mêng Chih-hsiang (孟知祥), 934, and Mêng Ch'ang (孟昶), 934–965. During all this time Szechuen was prosperous, prosperity reaching its height during the reign of Mêng Ch'ang.
2. See chapter 8, notes 13–17.
3. See chapter 11.
4. 毋昭裔.
5. Wang Ming-ch'ing (王明清), otherwise known as Wang Chung-yen (王仲言), in the book Hui-chu-lu (揮麈錄). Quoted in the Older History of the Five Dynasties (舊五代史), edition of 1739, section (卷) 43, folio 1, editorial note.
6. *Ai-jih-chai-ts'ung-ch'ao* (愛日齋叢鈔). Quoted in Older History of the Five Dynasties, edition of 1739, section 43, folio 1, editorial note. There is some confusion about the exact dates of Wu Chao-i's work. It is clear from all sources that Fêng Tao was largely influenced by the printing that he saw in Shu. According to Wang

Ming-ch'ing's account, it would seem that Wu Chao-i's work was already in full swing when Fêng Tao's forces conquered Shu. On the other hand it is apparent that Wu did not actually become prime minister till Shu regained its independence in 934. It seems probable that his educational activities and his patronage of printing began before he was actually elevated to the premiership. However that may be, it is certain that there was considerable printing going on in Shu before 929 when Fêng Tao's conquest of the province took place.

7. The four dynasties were the Later T'ang, the Later Tsin, the Later Han and the Later Chou. The seven emperors were Ming Tsung and Min Ti of the Later T'ang Dynasty; Kao Tsu and Ch'u Ti of the Later Tsin Dynasty; Kao Tsu and Ying Ti of the Later Han Dynasty; and T'ai Tsu of the Later Chou Dynasty.

8. The Classics were cut in stone during the T'ang Dynasty at Ch'ang-an (Si-an-fu) between 836 and 841, and are still in part preserved. Photographs of them have been published by Chavannes. It is these Stone Classics that in general served as a model for the wooden plates made under Fêng Tao's direction, though there is evidence that certain distinctive features of the Stone Classics of Shu also found their way into Fêng Tao's text. The original contribution of the National Academy was to incorporate commentary with the text. The manuscripts on which the Stone Classics of 836 to 841 were based contained both text and commentary. Of this only the text was copied on stone. Fêng Tao again included the commentary.

9. Of the printing of this period in the lower Yangtze Valley (Wu) nothing further is known.

10. *Ts'ê-fu-yüan-kuei* (冊府元龜), written about 1005 by Wang Hsin-jo (王欽若) and Yang I (楊億).

11. This account is abridged from the *Ts'ê-fu-yüan-kuei* (see above). This is the oldest and fullest account. For those who wish to compare different accounts of this event given by historians of the next three centuries, the following translations are appended:

Official history of the Later T'ang Dynasty (舊五代史, 唐書): "In the third year of the period *Ch'ang-hsing* (932), in the second month, the official known as *chung-shu* made a memorial to the emperor, proposing to take as a model the characters of the stone inscriptions and to cut plates for the printing of the Nine Classics."

Official history of the Later Han Dynasty (舊五代史, 漢書, 隱帝紀): "In the first year of the period *Ch'ien-yu* (948), in the fifth month, the National Academy sent a memorial to the emperor, stating that there were still four Classics—the *Chou-li*, the *I-li*, the *Kung-yang-chüan* and the *Ku-liang-chüan*—of which no plates had been prepared; and requesting that scholars be called together to edit the text for the purpose of producing the plates. The petition was granted."

Official history of the Later Chou Dynasty (舊五代史, 周書): "In the time of Ming Ts'ung of the T'ang (i. e. Later T'ang) Dynasty, because the Classics had in them many mistakes, Li Yü, the officer in charge of education, with T'ien Min and others, taking as models the Classics as cut in stone by Cheng Tan at the Western Capital, cut blocks for printing and thus spread the Classics abroad in the world. All who followed them had the work of these men as their foundation."

Official history of the Sung Dynasty, section entitled *Ju-ling-chüan*, (宋史, 儒林傳): "In the beginning of the *T'ien-ch'eng* period (926–930), T'ien Min, a doctor of the National Academy, directed Ma Kao to work with him in the revision of the Nine Classics. In the fourth year of the *T'ien-fu* period (939), T'ien Min was given the title of *chi chiu*. Though T'ien Min's scholarship in the Classics was based on solid ground, he loved forced interpretations of passages. In the Nine Classics which he edited, he frequently put forward his own subjective interpretation."

Ts'ê-fu-yüan-kuei (册府元龜, for authors and date see note 7): "Fêng Tao, the prime minister of the Later T'ang Dynasty, and Li Yü, wished to do honor to the ancient classical learning. They said, 'During the Han Dynasty Confucian scholars were honored and the Classics were cut in stone in three different scripts. In T'ang times also stone inscriptions containing the text of the Classics were made in the Imperial School. Our dynasty has too many other things to do and cannot undertake such a task as to have stone inscriptions erected. We have seen, however, men from Wu and Shu who sold books that were printed from blocks of wood. There were many different texts, but there were among them no orthodox Classics. If the Classics could be revised and thus cut and published, it would be

a very great boon to the study of literature. We therefore make a memorial to the throne to this effect.' The answer of the emperor was that T'ien Min and other scholars were to examine and revise the text of the Classics and of the Commentaries. The work was carried on with zeal, and included the Book of Poetry and the three commentaries of the *Ch'un-ch'iu*. The text was corrected, and the blocks were cut with great exactness. Proofs were adduced with regard to the exact reading of the text, and the work was brought together in books. The Classics were first in this way made exact, and then they were cut in blocks. Money was appropriated from the *Cheng-shih* office, and also unappropriated money from various branches of the government was given out, as well as taxes from second degree graduates, in order to pay for the labor. There were bestowed upon T'ien Min a state robe, fine silks and silver plate. Also to the official, Chao Chu, there were given a state robe and fine silk.

"In the fourth month of the year 932, the following order was given by the emperor, 'For the purpose of revising the stone inscriptions of the Classics, uniting them with the Commentaries, and having them cut in plates for printing, it is ordered that from the National Academy specially qualified men be appointed, five or six for each one of the Classics, to examine the text and to add to it the Commentaries; also that there be appointed from the court officials five men to supervise the work. [Names of five officials including T'ien Min.] Since the establishment of the text of the Classics is of great importance, an importance not to be compared with that of all other books, although I have already ordered the National Academy to appoint officers to edit the work, yet, because the work is so vast, and I still fear that errors may creep in, I order Ma Kao and the men with him (who are all great scholars and each one a specialist in the Classics), to make a final exact examination, in order that everything may be brought to absolute perfection."

Shên Kua (沈括), 1030–1093, in *Mêng-ch'i-pi-t'an*, (夢溪筆談), edition of 1631, book 18, section 9: "Under the T'ang Dynasty block printing, though carried on, was not fully developed. From the time of Fêng Ying-wang (Fêng Tao), first the Five Classics, and then in general all the ancient canonical works were printed."

Ssŭ-ma Kuang's History (finished about 1084): "In 932 orders were first issued to edit the Nine Sacred Books and print them for

sale." . . . "Formerly in the time of Ming Tsung of the T'ang (Later T'ang) Dynasty, the ministers Fêng Tao and Li Yü prayed the emperor to command T'ien Min of the National College to correct the Nine Sacred Books, then to cut blocks for them and print them for sale, and the court assented. The present edition was printed and presented to His Majesty on the *Ting-szŭ* day of the month. From this time forth, even in periods of anarchy, the Nine Sacred Books were transcribed and diffused very widely." (Meadow's translation.)

Yeh Mêng-tê (葉夢德), about 1130, quoted by Ma Tuan-lin about 1319: "Before the T'ang Dynasty all books were manuscripts, the art of printing not being in existence. . . . In the time of the Five Dynasties, Fêng Tao first memorialized his sovereign, praying that an official printing establishment might be put in operation." (Meadow's translation.)

Chu Hsi's History (finished about 1172): "In 932 the T'ang (Later T'ang) Dynasty for the first time cut blocks for the Nine Sacred Books and had them printed for sale." (This quotation and the two preceding are from the translation of Thomas T. Meadows, in Miscellanies of the Philobiblon Society of London, vol. 6, pp. 1–33. There is some question about the rendering of the word here translated 'for sale.')

Wang P'u (王溥), 922–982, in *Wu-tai-hui-yao* (五代會要): "In 932 the *chung-shu* official wrote a memorial recommending that, with the Stone Classics as a basis, the Nine Classics be printed from plates. It was ordered by the emperor that the National Academy bring together leading Confucian scholars with their assistants, and that they should take copies (rubbings?) of the Stone Classics from the Western Capital; and that, each according to the particular Classic that was his speciality, they should copy and annotate the text, and then read them through with the minutest care; that then workmen of ability in the printing of characters be employed; that each department, following the model prepared, should cut the plates, and that the books thus printed should be spread abroad in the world. If anyone should have a desire in the future to write a copy of the Classics, it should be forbidden to do so except in accordance with these printed copies; that it should not be allowed again to bring out miscellaneous editions. In the same year in the fourth month, the

order was given by the emperor that the guest friend of the crown prince, Ma Kao, [and other officers, including T'ien Min] be appointed to have oversight of the work."

Yü-hai (玉海) by Wang Ying-lin (王應麟), 1223–1296: "In 932 in the second month, the emperor ordered the National Academy to revise the text of the Nine Classics, and, using the books (rubbings?) of the stone inscriptions from the Western Capital, to have them copied and cut on wooden plates, in order to have them spread abroad through all the empire. In the fourth month, Ma Kao, Ch'en Kuan, and T'ien Min were ordered to examine the work with the greatest care. In the sixth month of 953, the plates of the eleven Classics, together with the *Er-ya*, the *Wu-ching-wên-tzŭ* and the *Chiu-ching-tzŭ-yang*, were finished, and T'ien Min presented them to the emperor."

Except where otherwise specified, the above translations are from the text contained in the Journal of Sinological Studies for Jan., 1923. (See Bibliography.)

12. By piecing together the various accounts it would seem that the Nine Classics were: *Yi-ching*, *Shu-ching*, *Shih-ching*, *I-li*, *Chou-li*, *Li-chi*, and the three commentaries of the *Ch'un-ch'iu*. At the same time there were printed the following: *Hsiao-ching*, *Lun-yü*, *Er-ya*, *Wu-ching-wên-tzŭ* (五經文字) and *Chiu-ching-tzŭ-yang* (九經字樣).

The names of these two last, which were commentaries written during the T'ang Dynasty on the "Five Classics" and the "Nine Classics" respectively, may account for the fact that while most authorities speak of Fêng Tao as having printed the "Nine Classics," Shên Kua speaks of his work as the printing of the "Five Classics." Both "Five Classics" and "Nine Classics" were conventional terms used at different times to refer to the Confucian canon. (Compare our use of the words "Pentateuch" and "Hexateuch.")

13. This is the account in the *Wu-tai-hui-yao* (五代會要). The *Ts'ê-fu-yüan-kuei* (see above) gives additional details, including an account of the charge of embezzlement that was brought against T'ien Min in connection with his management of this printing project, and how it was hushed up.

Two years after the publication of the Classics (955), another book

was entrusted to T'ien Min for printing. It was the *Ching-tien-shê-wên*. Chang Chao, minister of war, was associated in the work.

14. The question of the exact date of Wu Chao-i's printing of the Classics and how this printing relates to that of Fêng Tao at the national capital is as difficult as is that of the beginning of Wu's career. K'ung P'ing-chung is authority for the statement that Wu Chao-i of Shu had the Five Classics printed from plates during the period 951-954. The *T'ung-chien* is more exact and says that Wu Chao-i opened schools and had the Nine Classics printed in 953. As this is the very year in which Fêng Tao and his colleagues presented their completed work to the emperor, it is not impossible that authorities have confused the two events. On the other hand it is more likely that the same work was going on in the imperial capital and in the capital of Shu, the two courts rivalling each other to see which could complete the task first. It is certain that the text of the Stone Classics of Shu affected not only the Shu printing, but the printing of the imperial capital as well. For a fuller discussion of this whole question, see article by Wang Kuo-wei (王國維) in 國學季刊 (Journal of Sinological Studies) for January, 1923, pp. 139–145. It is to be noted (though not mentioned in the article referred to) that both Ssŭ-ma Kuang and Chu Hsi, writing in the Sung dynasty, mention the early wide diffusion of printing in Shu and state that the Classics were printed there at the same time that they were being printed in the imperial capital.

The conclusion of Wang Ming-ch'ing's statement, quoted above, makes this dependence of Fêng Tao's work on the printing of Shu even more emphatic. After describing Wu Chao-i's printing in Shu, he concludes, "When the emperor Ming Tsung conquered Shu, he ordered Li O, a scholar of the National Academy, to write the text of the Five Classics. Blocks were cut in the National Academy. This was the beginning of the printing of the National Academy."

15. This book was reprinted in Tokyo in 1884 in the collection 古逸叢書 under the title 影覆宋蜀大字本爾雅. It has been discussed by Pelliot (Bulletin de l'Ecole Française d'Extrême-Orient, 1902, vol. 2. pp. 316–317) and by Wang Kuo-wei (Journal of Sinological Studies, Jan., 1923, vol. 1, pp. 143–145). Both Pelliot and Wang Kuo-wei come to the conclusion that this is a Sung reprint

of the Li O original, and that it is probably a very exact reproduction of the original, but with the taboos changed. (The characters 孝 and 高 are avoided, indicating that the reprint was made during the reigns of Hsiao-tsung and Kao-tsung of the Sung Dynasty).

16. Exclusive of duplicates.

17. The book referred to was the 佛說父母恩重經. See 平津館讀碑續記, as quoted by P. Pelliot in his article, *Documents chinois trouvés par la Mission Koslov*, Journal Asiatique, 1914, p. 511.

CHAPTER X

THE HIGH TIDE OF CHINESE BLOCK PRINTING THE SUNG AND MONGOL DYNASTIES (960–1368)

1. See chapter 12, note 19.
2. See Pelliot, *Bulletin Critique, etc.*, T'oung Pao, 1922, vol. 21, pp. 432–434. See also chapter 12, note 17.
3. Chapter 22.
4. The *T'ai-p'ing-kuang-chi* Encyclopedia was, according to Giles, printed in 981 (see Giles' account in Encyclopedia Britannica, article *China*). The *Shuo-wên* (說文), a dictionary written about A.D. 100, appeared in print between 984 and 988. (See Liu An, page 6.)
5. Chü Chung-cheng (句中正) of I-chou (Ch'êng-tu). See Liu An, page 6.
6. 五經正義.
7. The full story is told by Wang Ming-ch'ing (王明清), in the book *Hui-chu-lu* (揮麈錄). For Wu Chao-i's earlier career in Szechuen, see previous chapter; also Liu An, page 24.
8. The dates of the first printed edition of the dynastic histories are as follows (according to 玉海):

Shih-chi (Ssŭ-ma Ts'ien) and Former Han:	994
Three Kingdoms, Tsin and T'ang:	1000–1002
Later Han:	1022
North and South Dynasties and Sui:	1024–1027
Liang, Ch'ên, etc.:	1061–1063

There is some question about the T'ang history, here assigned to 1000–1002. It may not have been printed till 1061–1063. There are conflicting statements also about the date of the Later Han history. Records of other books printed by the government printing office from 955 to 1026 will be found in Liu An, pp. 9–11.

The exactness with which the dynastic histories were printed is described, no doubt with some exaggeration, by the Persian historian, Rashid-eddin. See chapter 17.

9. This is indicated by the list of missing blocks, one of which is from the *Han-shu*.

10. 陳起. For full account of books published by Ch'en Chi and his son, see Yeh Tê-hui, *chüan* 2, folios 28–31.

11. 尹.

12. 余. For full account of the work of the Yü family at Chien-an, see Yeh Tê-hui, *chüan* 2, folios 13–18.

13. 建安.

14. The importance of the province of Fukien as a publishing center and the sort of work done in that and other provinces is thus described by Yeh Mêng-Tê, writing about 1130: "At present, of all books printed throughout the empire, those of Hangchow are considered the best, those of Szechuen come next, and those of Fukien are worst. Of late years the printing blocks of the capital begin to stand but little after those of Hangchow, but the paper used is not so fine. In Szechuen and Fukien, soft wood is much used for cutting into printing blocks, the object of which is their easy completion, with a rapid sale for the books. Hence the workmanship is not good. Fukien editions are spread all over the empire, and that is on account of the ease with which they are got ready." Translation of Meadows in Miscellanies of the Philobiblon Society, vol. 6, pp. 15, 16.

15. A curious story, preserved by Kao Wên-hu (高文虎), in the book entitled *Liao-hua-chou-hsien-lu* (蓼花洲閒錄), tells of two literary graduates from Shu, who, in the first years of the Sung Dynasty, purchased the printed essays of the prize-winners in the examinations.

16. A list of local histories of the Sung period, preserved in the T'ang Chung-yu collection, is found in Liu An, p. 20. "Histories" is perhaps a misnomer for these books. They are rather summaries of the

official archives, such as are still published from time to time by every Chinese city.

17. A copy of this great work is in the Library of Congress at Washington, and is described in some detail in the *Report of the Librarian of Congress for 1923* (pp. 174–178). Among the Sung and Yüan editions are the following:

Ssŭ-ma Kuang's great history of China.
Ssŭ-ma Kuang's collected works (printed in 1133).
Adventures of the Buddhist monk Hsüan Tsang in India.
Illustrated description of crop plants (printed in 1204).
Collected poems of Tu Fu, the T'ang poet.
Collected poems of Su Tung-p'o, the Sung poet.
About sixty other collections, each containing the complete works of some one author.

18. From *T'ien-lu-ling-lang* (天 錄 琳 瑯), quoted by Liu An, pp. 51–52.

19. Shên Kua (1030–1093) states that it was a capital offence in the Liao empire for anyone to attempt to carry a book over into the empire of the Sungs. Another writer, however, Ch'ien Ts'eng (錢 曾), mentions a book printed in the Liao realm in 997 by the monk Chih-kuang (知 光) and carried into China.

In 1012 there is a record that the kingdom of Na-shao (那 少) asked for Confucian books and a copy of each of the Classics was sent there. Liu An, page 12.

20. 平 陽.

21. A special office was opened in 1194 in the Kin empire for the translation and copying of the Classics. See Liu An, p. 13.

22. Medical work of Sun Ssŭ-miao (A.D. 581–682), printed about 1300. Among the Koslov finds from Kara-khoto.

23. See H. H. Howorth, *History of the Mongols*, vol. 1, page 274. Also Yule's *Marco Polo* (First edition), vol. 1, page 401.

24. 劉 知 遠 傳. Printed about 1300. In Koslov collection from Kara-khoto.

25. In Koslov collection from Kara-khoto.

26. In 1391 copies of the Classics and the dynastic histories were distributed among all the schools of North China. For additional particulars about early Ming printing, see Liu An, pp. 14, 26, 27.

27. Kiangsi remained an important printing center during Mongol times. A list of Kiangsi books of the period 1312–1321 is given in Liu An, page 22.

28. Known as 編修所. Another office known as 經籍所 was opened at P'ing-yang.

29. The central government office for the printing of books was known by different names at different periods in the Mongol Dynasty, corresponding probably with slightly different functions. In 1236, under Ogatai, it was 編修所; in 1273 under Kublai 祕書監; in 1290 興文署; in 1330 藝文監.

30. The office for printing the "sacred teachings of the imperial ancestors," opened in 1330, was the 廣成局.

31. See chapters 14 and 16.

32. See Bunjiu Nanjio, *Catalogue of the Chinese Translation of the Buddhist Tripitaka*, page xxiv.

33. It was in Tokyo at the time that Nanjio wrote. I have not been able to learn whether it survived the earthquake.

34. Bunjiu Nanjio. See note 32 above.

35. There are a number of books extant which with more or less reason claim an earlier date than 1157, but their dating is uncertain. The oldest claims to date from 1114. See Satow, *Further Notes, etc.*, Transactions of the Asiatic Society of Japan, 1882, vol. 10, p. 257. According to Satow, the earliest mention in Japanese literature of the printing of books in Japan is in 1172, and there is a record of the Diamond Sutra being printed in 1184. Satow's two articles give a list with dates of such Japanese printed books of the thirteenth and fourteenth centuries as were available at the time he wrote (1882). Pauthier (Mémoires de la Société des Etudes Japonaises, vol. 6, pp. 185–186) contains the same list with certain revisions. Kamesō's list (pp. 22–23), published in 1909, is more up to date and exact.

36. Satow, *History of Printing in Japan*, p. 53.

37. Chapter 14.

38. P. Pelliot, *Une Bibliothèque mediévale retrouvée au Kan Sou*, Bulletin de l'Ecole Française d'Extrême-Orient, 1908, vol. 8, pp. 525–527.

39. The information contained in this chapter concerning the Koslov discoveries is derived in the main from an article by P. Pelliot in Journal Asiatique, May-June, 1914, series 2, vol. 3, pages 503 ff. (See

Bibliography.) For further details the reader is referred to that article.

40. At Tun-huang there were found dated fragments and single sheets earlier than 1016 and at least two undated books that are generally considered to have been earlier, but the Diamond Sutra of 868 is the only dated book that is older. Liu An's reference to a Diamond Sutra of 961 from Tun-huang (page 6) seems to be due to confusion with the Diamond Sutra of 868.

41. A translation not hitherto known.

42. The patron was an official at Tan-chou (丹州) in Shensi (now I-ch'üan). The two engravers were from two subprefectures which are now included in the prefecture of T'ung-chou (同州) in the same province. Pelliot, Journal Asiatique, 1914, pp. 507–508.

43. *Yüan-shih* (元史), chapter 18, fol. 4v°. See Pelliot, Journal Asiatique, 1914, p. 518.

44. See chapter 19.

45. 經典釋文.

46. One is a commentary on Chuang-tzŭ, an edition apparently of the thirteenth century—a book lost and unknown in China from the fourteenth century on. The other is no. 372 in P. Wieger's list.

47. Cordier, *Histoire de Chine*, vol. 2, p. 336.

48. Howorth, *History of the Mongols*, London, 1876, vol. 1, page 274; Yule's *Marco Polo* (First edition), vol. 1, p. 401.

49. Quoted from Yeh Mêng-tê by Ma Tuan-lin in *Wên-hsien-t'ung-k'ao*. Translation of Meadows in Miscellanies of Philobiblon Society, 1860, pp. 14–15. The Chinese text is quoted by Yeh Tê-hui, vol. 1, folio 24.

CHAPTER XI

THE PRINTING OF PAPER MONEY

1. "As to the skin currency (皮幣) of the ancient kings, the feudal princes used to offer these skins as presents when they were invited to court. 'At present' (quoting from the annals of the reign of Wu Ti, (B.C. 140–86) 'pieces of the skins of white stags are used, a foot square and embroidered at the hems, and of them a skin currency is made, of a value of forty thousand cash. Whenever kings, princes and noblemen

of imperial clans come up to court, to have an audience with His Majesty and to offer presents, they receive these pieces of skin as badges of honor. Thereupon they will be brought in circulation, as they will always be desired by persons who wish to have an audience'." Ma Tuan-lin (馬 端 臨), *Wên-hsien-t'ung-k'ao* (文 獻 通 考), 8:8a. Quotations in this chapter simply marked Ma Tuan-lin are from this book (published about 1319), which is the main source for the history of paper money. In general in these quotations the translation of Vissering (see Bibliography) has been followed, though the Chinese text has been compared and where necessary the translation has been revised.

2. "Under the reign of the emperor Hsien Tsung (806–821), because money was scarce again, the use of copper tools and implements was prohibited. At that time merchants who came to the capital brought with them the money they had received in outlying provinces, and deposited it in the public treasury. . . . Instead of their money, they received certificates of indebtedness (合 券). These bore the name of 'flying money' (飛 錢) . . . The imperial governor of the capital proposed to suspend the issue of paper money to the merchants." Ma Tuan-lin, 8: 39, 40. Vissering, p. 120. The phrase 合 券 means literally "fitting together documents." It would seem to imply that the receipts were torn from the stubs, and that for authentication, when brought for redemption, they must again be fitted to the stubs, after the manner of a Chinese laundry ticket.
3. For text and translation see Vissering, p. 121.
4. As Buddhist charms had been printed in Japan some thirty years earlier than this, and presumably still earlier in China, it is not inherently impossible that this paper money was printed. However the whole tenor of the references to printing in Fêng Tao's time, both in Shu and in the imperial capital, renders it improbable that any public official printing had been done a century and a half earlier. It is to be noted also that, while this "flying money" is appealed to as a precedent at the time of the first issue of true paper money in the Sung Dynasty, the words used to describe the new issue are all of them different.
5. See Terrien de Lacouperie, *Paper Money of the Ninth Century*, Numismatic Chronicle, vol. II., third series, pp. 334–341, London,

1882; and Andrew M. Davis, *Certain Old Chinese Notes*, Boston, 1915. See also note 18.

6. 交子.

7. See Vissering, p. 167.

8. A number of facts point directly to this conclusion, which is generally accepted by both Chinese and Western writers. The paper money now extant, belonging to the fourteenth century, is clearly and beautifully printed, the seals being stamped on later in red in lieu of signature. Such references as we have in Ma Tuan-lin, early as well as late, would seem to describe just such notes as those from the fourteenth century that have come down to us. Although the indentity of the Chinese words for "seal" and "print" causes some ambiguity, there is one passage under the year 1168 (Vissering, p. 195), where the words 印造 are used, and these words, taken in connection with the context, admit of no doubt that true printing is referred to. This makes the printing of notes as early as 1168 a certainty. There is no reason to suppose that the process there described was any different from that previously in use. The very great quantity of notes in circulation—nearly two million in the period 995–998 and steadily increasing—would necessitate printing. During the tenth century—to which the above arguments do not apply with such full force as for the later period—the notes were produced in exactly the places where other printing is known to have been carried on at the same time. It is natural to suppose therefore that from the time of the first issue in Shu all notes were printed.

9. The bills of exchange (交子), as the notes of the eleventh century were called, were not convertible on demand, but were issued for a term of sixty-five years, with a provision, however, that under certain circumstances they could be redeemed at specified times every three years during the period. When in 1076 the issue of 1011 (these dates are approximate, as there are discrepancies in detail in the sources) came due, a new issue of 1,250,000 *tiao* was made in order to replace it, apparently not increasing the total circulation. The first actual increase in the total circulation was in 1094, when an additional 150,000 was issued. Up to this time there had always been a reserve fund in metallic currency back of the notes, amounting to three-sevenths of the total circulation, but during the years between 1094 and

1107, while circulation was largely increased, this rule was not followed.

10. Vissering, pp. 207–208.
11. H. Cordier, *Histoire de Chine*, vol. 2, p. 240.
12. For table, showing year by year the issues of paper money during the early part of the Mongol Dynasty, see H. B. Morse, *Currency in China*, Journal China Branch Royal Asiatic Society, 1907, vol. 38, p.23.
13. *Ibid.*, p. 22.
14. See chapter 17.
15. The Japanese notes were quite different in form from the Chinese, being only about six inches by two. They seem to have been well secured by a metallic reserve. See Yule's *Marco Polo* (Cordier edition), vol. 1, pp. 427–428; and Yule's *Cathay and the Way Thither* (Cordier edition), vol. 3, p. 150.
16. These writers are: William de Rubruquis (c. 1215–1270); Roger Bacon (1214–1294); Marco Polo (1298); Hayton (1307); Odoric (c. 1330); the archbishop of Soltania (c. 1330); Pegollotti (c. 1340); and Josafat Barbara (c. 1436). The more important of their statements are as follows:

De Rubruquis: "The ordinary money of Cathay is made of cotton paper, as large as a hand, upon which they imprint certain lines and marks made like the seal of Mangu (*imprimunt lineas sicut est sigellum Mangu*) . . . As for the Russians, the money which is current among them is made of little pieces of leather, marked with colors."

Odoric: "They have an edict from their lord that every fire (i. e. household) shall pay to the Great Khan annually a tax of one *balis*, i.e., of five pieces of paper like silk, a sum equal to one florin and a half."

Pegolotti: "There (at Cassai, i. e., Hangchow) you can dispose of the *sommi* of silver (silver ingots) that you have with you, for that is a most active place of business. After getting to Cassai you carry on with the money which you get for the *sommi* of silver which you sell there; and this money is made of paper and is called *balishi*. And four pieces of this money are worth one *sommi* of silver in the province of Cathay."

Paper money was mentioned also by a number of Arabic writers, including Ibn Batuta (1348) and Ahmed Shibab Eddin (died 1338).

Hayton is here included among European writers, because his writing was done in France and in the French language. His book is an account of the visit of his relative, the king of Armenia, to the court of the Great Khan.

17. Translation of Yule (Cordier's edition, vol. 1, pp. 423–426).

18. Plates purporting to represent banknotes of various dynasties from T'ang to Yüan are contained in a pamphlet by Ramsden (H. A. Ramsden, *Chinese Paper Money*, Yokohama, 1911) and a book by Davis (Andrew M. Davis, *Certain Old Chinese Notes*, Boston, 1915). These plates and the information concerning them are based on a Chinese work entitled *Ch'üan-pu-t'ung-chih* (泉布通志), which I am able to state on Pelliot's authority is a forgery. See also note 5.

A reproduction of a banknote found in a Chinese work, and a block for printing banknotes, both claiming to date from the Kin Dynasty, are described by Bushell (S. W. Bushell, *Specimens of Ancient Chinese Paper Money*, Journal of Peking Oriental Society, 1889, vol. 2, pp. 308–316) and have somewhat more claim to be regarded as genuine.

19. I am indebted for this description of the Mongol notes found by the Koslov expedition to Professor Basil M. Alekseiev of the Soviet University of Leningrad (Petrograd) who very kindly examined and described them for me.

CHAPTER XII

EARLY COMMERCE IN THOUGHT AND IN WARES ALONG THE GREAT SILK WAYS

1. For reports of recent discoveries of neolithic culture in China and a discussion of its relation to neolithic culture in other countries, see J. G. Anderson, *An Early Chinese Culture*, Bulletin of the Geological Survey of China, No. 5, 1923. Also J. G. Anderson, *Arkeologiske Studier i Kina*, Ymer, vol. 2. Stockholm, 1923.

2. For full discussion of what Chang Ch'ien's mission meant in the opening up of trade, see B. Laufer, *Sino-Iranica*, pp. 535 ff. Chang Ch'ien found bamboo staves and cloth from Szechuen already in use in Bactria, which he concludes came by way of India.

3. For additional details, and translations of the Chinese sources on which these statements are based, see F. Hirth, *China and the Roman Orient.*

4. The two authorities for the introduction of silkworm eggs during Justinian's reign are Theophanes and Procopius. Theophanes refers to the country from which the silk worm eggs were introduced as the "land of Seres," Procopius as "India." Both terms were at that time used very loosely by Greek writers. It is known from Chinese sources that silk culture was introduced into Khotan (at the western end of what is now Chinese Turkestan) in 419, and it is probable that it was from here that the eggs were introduced into Constantinople.

5. For fuller details and references to sources, see Beazley, *Dawn of Modern Geography*, vol. 1, pp. 186–191.

6. See Laufer, *Sino-Iranica*, pp. 539–540.

7. The chicken (or its prototype) is indigenous in northern India and Burmah. The date of its introduction to China cannot be determined; it was already known in the pre-Confucian period. It is first mentioned in Babylonian inscriptions in the seventh or sixth century, B.C. It is not mentioned in Homer or the Old Testament, but is constantly mentioned in the New Testament. Aristophanes calls it "Persian bird."

   The above is the generally accepted view (see Encyclopedia Britannica, art. *Fowl*). It should be added however that, in view of discoveries in the tomb of Tutankhamen, and other discoveries in Egypt, a certain amount of modification of this theory may be necessary.

8. The first mention of tea in Chinese literature, so far as known, is in the biography of Wei Chao in the *San-kuo-chih* (三國志). Wei Chao died in A.D. 273 and the author of the *San-kuo-chih* in 297. Tea had, however, not spread through north China till about the tenth century. It was very little known among the Mongols till the thirteenth or fourteenth century. (See P. Pelliot, *Bulletin Critique, etc.*, T'oung Pao, 1922, vol. 21, pp. 432–434.) On the other hand, tea is described by an Arab traveller in China in the ninth century and its use apparently spread to Russia and Western Asia during Mongol times. In consequence of this the name for tea in Russian, Turkish, Persian and Modern Greek is based on the north Chinese *ch'a*. It is not mentioned in European literature till 1588 when it was imported

from south China by the Portuguese, whose tea trade was soon superseded by that of the Dutch. Hence the word 'tea' and its variations, derived probably from the dialect of Fukien, is used in the languages of western Europe.

9. See chapter 19.

10. The carrot is apparently a native of northern Europe. It was cultivated by the Anglo-Saxons before they invaded Britain. It was carried by the Arabs into Persia in the tenth century. From there it entered China during the Mongol Empire. Laufer, *Sino-Iranica*, pp. 451–454.

11. The first mention of glass in China is during the time of the Three Kingdoms between 221 and 264 A.D. The glass here mentioned was probably imported from Alexandria. The manufacture of glass was apparently introduced into north China and south China independently and both during the 5th century. According to the annals of the Wei Dynasty, glass-making was introduced into north China between the years 424 and 452 from the kingdom of the Indo-Scythians (probably Khotan). According to the annals of the Sung (Liu Sung) Dynasty, the Emperor of Ta Ts'in (Rome or Constantinople) sent to the Emperor Wên Ti (424–454) a large variety of presents made of glass of all colors, and some years later a workman in glass who "was able to change fire stones into crystals, and who taught his secret to his pupils, whereby great glory was gained by all those coming from the West." S. W. Bushell, *Chinese Art*, vol. 2, pp. 58–69.

12. All true alphabets in the world appear to have sprung from one early source in Phenicia and Palestine. This alphabet reached India from its source by the Mediterranean almost as soon as it reached Greece. Through the early centuries of the Christian era the Indian forms of the alphabet vied with those coming directly from Syria for supremacy in Central Asia. The Tibetan alphabet, one of the Mongol alphabets, and the Korean alphabet were based on Sanskrit; while the alphabet of the Manchus, which is still seen on Chinese coins, goes back ultimately to a Syriac source, through Sogdian, Uigur and Mongol as intermediaries.

13. The history of spinach and of sugar are also interesting as showing how ideas found their way in these early days through Asia and Europe. The earliest known reference to spinach in any literature is contained in the annals of the T'ang Dynasty, where it is stated that

in the year 647 the king of Nepaul sent some spinach to the Chinese Emperor T'ai Tsung. There is some evidence that Nepaul got its spinach from Persia. At any rate it was in Persia that the Arabs found the vegetable not long after their conquest of the country. By the eleventh century it had spread through the Arabic dominions as far as Spain, but it was not until the fourteenth or fifteenth century—after the Crusades—that its entrance into Christendom is recorded. (Laufer, *Sino-Iranica*, pp. 392–398.)

Sugar cane was imported into China as early as A.D. 285 from Indo-China and was again imported into China from Persia during the seventh century. During the seventh century also a special mission was sent by the Chinese Emperor to Magadha in India to learn the process of boiling sugar, and this Indian method was adopted by the sugar-growers of Yang-chou. Through the Middle Ages the Saracen Empire was the center of sugar production. Sugar-cane was introduced by the Arabs from Persia into Egypt, Sicily and the south of Spain. As late as the thirteenth century sugar refiners from Cairo came to China to teach the superior methods of sugar refining that were practised in Egypt. From Cyprus and Sicily sugar production was carried to Madeira about 1420 and to the Canaries in 1503. Sugar production in Brazil and Haiti began also very soon after the discovery of America.

Other examples of the spread of ideas through the Euro-Asiatic continent are found in the study of such games as dice, chess and backgammon. The spread of playing cards, as more closely related to printing, is studied in chapter 19.

14. Berthold Laufer, *Sino-Iranica*, Chicago, 1919. The writer is indebted to this book for most of the material in this chapter concerning agricultural plants.
15. Yahb-allaha III, patriarch of the whole Nestorian church, with seat at Bagdad, 1281–1317.
16. This place, rendered in Arabic Ḥanfu, has sometimes been identified with Hangchow. For its identification with Canton see statement by Pelliot in T'oung Pao, 1922, vol. 21, p. 410.
17. G. Schlegel, *On the Invention and Use of Firearms and Gunpowder in China prior to the Arrival of Europeans*, T'oung Pao, 1902, series 2, vol. 3, pp. 1–11; P. Pelliot, *Bulletin Critique, etc.*, T'oung Pao, 1922, vol. 21, pp. 432–434.

18. There are certain indications that the compass may have been used for navigation in south China about the fifth century, but it cannot be stated with certainty.
19. F. Hirth, *History of Ancient China*, pp. 126–136; Jules Klaproth, *Lettre à M. le Baron A. de Humboldt sur l'invention de le boussole*, Paris, 1834.

CHAPTER XIII

PAPER'S THOUSAND YEAR JOURNEY FROM CHINA TO EUROPE

1. A. Blanchet, *Essai sur l'histoire du papier*, pp. 16–17. Note especially quotations from *Chou-tien-p'u*, *Tien-chen-p'u*, and *Pen-ts'ao-kang-mu*.
2. This paper from Loulan, containing a fragment from the Classics, is undated, the date being estimated from the style of writing, etc. The oldest certain dated document from Loulan (which is the oldest dated paper yet found) is of the year 264. Another fragment probably bears the date of 252, but the year cannot be deciphered with certainty.
3. There are one or two isolated points where the use of wood for writing parallel with that of paper persisted. At Miran it continued till about the eighth century. Otherwise the triumph of paper by the end of the fifth century was complete.
4. A. F. R. Hoernle, *Who was the Inventor of Rag Paper?* Journal of Royal Asiatic Society, 1903, pp. 663 ff.
5. F. Hirth, *Chinese Studies*, page 270.
6. The raw fibers are largely those of paper mulberry, laurel and China grass (*Boehmeria Nivea*).
7. The following, written in Parma in 1782 by Andrez, and quoted by Thomas (Isaiah Thomas, *The History of Printing in America*, Worcester, Mass., 1810, pp. 37–38), indicates one of the views that used to be held with regard to cotton paper, "Paper made from silk was anciently fabricated in China, the art of making this paper was carried from China to Persia about the year 652 and to Mecca in 706. The Arabs substituted cotton and carried the art of paper-making into Africa and Spain."

8. The earliest paper in the collection is believed to date somewhere between the year 796 and 816. See Grohmann, page 58. Karabacek would date it a few years earlier than 796.
9. The famous manuscript of the Convent of San Gilos, dating from 1129, has alternate pages of parchment and paper. This may have been paper imported from Africa, though it is more likely that it was Spanish, and would therefore antedate the statement here quoted from El-Edrisi.
10. Cologne and Mainz both claim to have had paper factories as early as 1320, but the claim is disputed. Nuremberg's manufacture of paper is the first that is known with certainty.
11. It seems fitting that Nuremberg should have been the home a century later of Albrecht Dürer, who was not only Germany's greatest painter, but also a maker of woodcuts on paper.
12. For further details and dates as to the progress of paper, see the accompanying map and chart.

CHAPTER XIV

THE PRINTING OF THE UIGUR TURKS IN THE REGION OF TURFAN

1. This mingling is illustrated in the Buddhist monastery of Toyok near Turfan, which now through a curious confusion of faiths has become a point of pilgrimage for Moslems from India and Arabia. Among the papers found in this old monastery were an enormous number of Chinese Buddhist manuscripts, fragments of Indian manuscripts written on birch bark and on palm leaf, fragments in a still unknown Semitic script, several manuscripts in old Turkish runes, some Sogdian writings, Manichean writings in Turkish and Persian, Uigur writings in four different kinds of script, some Syriac fragments, some Manichean and Buddhist embroideries, and some beautiful Manichean miniatures. In the ruin of an old church near by are a large number of Christian texts in Syriac. No wonder the Mohammedans regard as sacred the place where so many peoples and faiths have met!
2. See chapter 8.
3. Only a part of this book—some ten leaves—has been found.

4. The Tangut script was officially adopted in 1036. For brief description and historical sketch of the Tanguts, see Cordier, *Histoire de Chine*, vol. 2, pp. 199–203.
5. It is interesting to note that these six languages are exactly the same as those which Pelliot found in manuscript and printed remains in one of the later caves at Tun-huang. Furthermore a stone found at Tun-huang, dated 1348, contains parallel inscriptions in these same six languages. And four of these languages (all except Mongol and Sanskrit) are mentioned by De Rubruquis as the languages used for writing at the Mongol court when he visited the Grand Khan in the middle of the thirteenth century.
6. See chapter 22.
7. "The Uigurs, an ancient Tartar people, have at all times been celebrated in Tartary. They have cultivated sciences and arts. . . . They write like the Chinese from the top down; and were the first to use wooden blocks for printing." De Guignes, *Histoire des Huns*, 1, VII. Strange to say, this was written in the eighteenth century, before the discovery of any of the Uigur printing at Turfan.
8. F. H. Skrine and E. D. Ross, *Heart of Asia*. London, 1899. Pp. 155–157.
9. "During the reign of the grandsons of Jinghis Khan, the accountants and chief officers of government in Mavara-un-Nar, in Khorasan and in Irak were all Uigurs. Similarly it was the Uigurs who filled these posts in China during the reigns of the sons of Jinghis. Ogatai entrusted Khorasan, Mazandaran and Gilan to a Uigur named Kurguz, who was well versed in keeping accounts, and knew thoroughly how to levy in these provinces the taxes, which he remitted regularly each year to Ogatai." Abul Ghazi, quoted by N. Elias and E. D. Ross, *The Tarikh-i-Rashidi*, page 94. There are many other notices to the same effect, both in Chinese and in Arabic.

CHAPTER XV

ISLAM AS A BARRIER TO PRINTING

1. It is probable that an edition of *Râshid* had already appeared at Constantinople in 1714 under similar auspices. These were the only two books published.

2. I am indebted to Dr. Grohmann for the statement that, according to Theseus Ambrosius (d. 1540) in the book *Introductio in Chaldaicam Linguam* (Pavia, 1539), folio 11, Father Alessandro de Paginini of Brescia, who printed in Venice between 1485 and 1499, brought out an edition of the Koran in Arabic type. This was without doubt the oldest Arabic printing in Europe.

   At Fano Arabic printing was done in 1514, and in 1518 it seems probable that another edition of the Koran was printed in Italy.

3. For English translation of Chou Ju-kua's works, with valuable introduction and notes, see F. Hirth and W. W. Rockhill, *Chau Ju-kua*, St. Petersburg, 1911.

4. *Travels of Ibn Batuta*, translated by Samuel Lee. London, 1829. Pp. 215–216. There has recently been some doubt expressed as to whether Ibn Batuta was ever in China. (Gabriel Ferrand, *Relation de voyages, etc.*, Paris, 1913.) Whether Ibn Batuta was ever in China himself, the book expresses the view of Arabs of his day, and furthermore it contains a true picture of China that could only have been derived from the narrative of a traveller in that country.

5. See chapter 17.

CHAPTER XVI

THE MEETING OF CHINA AND EUROPE IN THE MONGOL EMPIRE

1. "It seems that at that time Eastern Mongolia was connected with Persia and Russia by great highways through Central Asia. The Chinese and Mongol writers of that period record that Genghis Khan on his expedition to Western Asia in 1219 first established these roads and had great difficulty in leading them through the inaccessible mountains which in some places stopped the passage. It is further related that the great conqueror's successor, Ogatai, established on these roads military stations on a large scale. At that time considerable Mongol armies were sent repeatedly to the far West, overrunning Western Asia and the eastern part of Europe. Couriers passed hither and thither, as well as envoys from different Western kingdoms. There have been preserved five Chinese narratives of journeys to the far West, published in the thirteenth century." E. Bretschneider, *Mediaeval Researches from Eastern Asiatic Sources*, vol. 1, p. 4.

2. See chapter 14, esp. note 4.
3. For Mongol paper money, see chapter 11. For other printing in the Mongol language found at Turfan and Tun-huang, and for records of Mongol printing in China, see chapters 10 and 14.
4. For further details with regard to the Chinese prints of Kara-khoto, see chapter 10. Also P. Pelliot, *Les documents chinois trouvés par la Mission Koslov à Khara-khoto*, Journal Asiatique, 1914, series 2, vol. 3, pp. 503–518. For information about the Tangut and Mongol prints, I am indebted to Professor Basil M. Alexeiev of the University of Leningrad (Petrograd), who has very kindly examined them for me.
5. Chapter 10.
6. For this statement of John of Plano Carpini, and for discussion of its implications, see P. Pelliot, *Les Mongols et la Papauté*, Revue de l'Orient Chrétien, series 3, vol. 3 (23), nos. 1 and 2 (1922–1923), pp. 27–28. An impression from this same seal, recently found in the archives of the Vatican, is reproduced (with translation) in the same article, page 22.
7. The currency of Russia in earlier times had been the furs of animals, especially the Siberian squirrel, which were worth an exact weight of silver. It is generally believed by Russian writers that during Mongol times, under the influence of the paper-money of the rest of the Mongol empire, the Russians began to use, instead of whole furs, small pieces of fur stamped by the government and redeemable in the stores of the government for whole skins. The matter is the subject of some debate. It is discussed and a full bibliography given by A. L. von Ebengreuth in *Allgemeine Münzkunde und Geldgeschichte*, Munich and Berlin, 1904, page 36.
8. The Latin is *typographos artifices*. The word *typographos* is probably used loosely for ordinary Chinese printing rather than for typography. I have therefore translated it merely "printers."
9. "Quod maxime mirandum videtur, ibi (Canton) esse typographos artifices, qui libros historias et sacrorum ceremonias continentes, more nostro imprimant: quorum longissima folia introrsus quadrata serie complicentur. Cuius generis volumen a rege Lusitaniae cum elephante dono missum Leo pontifex humaniter nobis ostendit: ut hinc facile credamus eius artis exempla antequam Lusitani in Indiam penetrarint per Scythas et Moscos ad incomparabile litterarum praesidium ad nos pervenisse." Paulus Jovius (Paulo Giovio),

Historia sui Temporis (originally published in 1550), edition of 1558, book 1, chapter 14, page 161. This earliest European mention of Chinese printing has apparently not before been noticed except in an unpublished manuscript in St. Bride's Library, London, by Richard Smith, written in 1670, in which Jovius' view that printing was introduced from the "Indians of Cataia" by means of "the Scythians and Muscovites" is rather unfavorably discussed. Jovius had been an ambassador to Moscow not long after the new Russian state had freed itself from Mongol domination, and has left a history of Russia as well as several books descriptive of that country. His statements concerning Russia therefore carry considerable weight. On the other hand, he quotes no authority, and his statement may be only a conjecture, based on his general knowledge of Russian history and of Chinese printing.

10. This letter from the Grand Khan to the Pope was discovered in the *Archivio di Castello* by P. Cyrille Karalevskyj. It was identified and deciphered by Pelliot, and has been published by him, together with a facsimile of its seals. (Paul Pelliot, *Les Mongols et la Papauté*, Revue de l'Orient Chrétien, 1922–1923, series 3, vol. 3 (23), nos. 1 and 2, pp. 3–30). The seal impressions, like the Chinese seal impressions on the letters from the Persian Ilkhans (see chapter 17, note 2) are 5½ inches square, but these are in Mongol, not Chinese. Pelliot (pp. 27–28) has given his reasons for concluding that these seal impressions were made from the seal described by Carpini and cut by the Russian seal cutter Cosmas. Some half dozen other letters from Mongol sovereigns (most of them from Ilkhans of Persia) have also recently been found in the Vatican archives, and will be published in forthcoming numbers of the same review. A list of these documents will be found in the article already published (see above), pp. 2 and 3.

11. A number of Chinese seals were dug up in Ireland about 1800 and are described in a paper read before the Belfast Literary Society by Edmund Getty in 1850, entitled, *Notices of Chinese Seals found in Ireland.* Getty believes that they were brought to Ireland by early monks and date from the eighth or ninth century, but it is more than probable that they were brought by Irish sailors at a much later date.

12. De Rubruquis, Latin edition of d'Avezac, page 329. Additional

interest attaches to the reports of De Rubruquis, on account of the fact that Roger Bacon read his book and was personally acquainted with him after his return from Central Asia. (*Opus Majus*, Oxford edition of 1897, vol. 1, pp. 353–366.)

13. It is Pauthier's edition of Marco Polo (G. Pauthier, *Le livre de Marco Polo*, introduction, page 78) that has given currency to this story. Pauthier's statement is quoted from Delpierre (Octave Delpierre, *Analyse des travaux de la Société Philobiblon à Londres*, page 23), which is in turn quoted from a paper read by R. Curzon before the Philobiblon Society in 1860. (Miscellanies of the Philobiblon Society of London, vol. 6, page 25). On what Curzon based his statement is uncertain. It seems probable that it was an old Italian tradition.
14. See chapter 11.
15. The signification of "Tarsic" is uncertain. Cordier (*Histoire de Chine*, vol. 2, p. 413) suggests Estrangelo script. Ross (E. D. Ross, *Tarikh-i-Rashidi*, p. 96), commenting on this passage, says it means Uigur. Whatever the script may have been, the language was probably either Uigur or Mongol.
16. Seven were actually sent, but only three arrived.
17. The later history of this first phase of Catholic missions in China is shrouded in mystery. On the death of Monte Corvino in 1328, Friar Nicholas of Paris was sent out from Avignon to succeed him, accompanied by twenty monks and six lay brothers. They left Avignon in 1333, and in 1338 are heard of at Almaligh in Eastern Turkestan. By this time Islam was rapidly gaining ground in Eastern Turkestan and the land route was becoming increasingly difficult. There is no record that they ever reached China. However, in 1338 Europeans arrived in China with letters written in 1336, and again in 1342 the Pope sent an embassy, headed by Marignolli, who after four years returned to Europe and wrote an account of his journey. After Marignolli's return in 1346 nothing further is known with certainty of the mission in China, though there are indications that the last missionaries in Fukien were martyred in 1362. From the Avignon end it is known that more missionaries were sent out. William of Prato was made archbishop of Cambaluc in 1370 and sixty clergy followed him. Francis of Podio was sent the next year as apostolic legate with twelve followers. The Vatican records show a full line of archbishops of Cambaluc through the next century. But, so far as

known, they went out into the darkness, never to be heard of again. The break-up of the power of the Ilkhans of Persia and the renewed activity of the Turks closed both the land route and the water route between Europe and the Far East, while the fall of Mongol power in China in 1368 rendered China inhospitable to foreigners. For a century and a half the barrier between China and the West was seldom crossed. Columbus tried to reopen a route for intercourse in 1492, Vasco Da Gama succeeded in 1499. But even after the discovery of this lengthy route around Africa, it was centuries before China and Europe came again so close together as they had been during the time of the Mongols.

18. Further exploration of libraries and archives in Italy may add evidence with regard to this hypothesis. In 1922, in the Laurentian Library in Florence there was rediscovered a Latin manuscript Bible that had been in use in China by missionaries of the Mongol period. Unfortunately none of the Chinese or Mongol Christian literature that they prepared has yet been discovered. It would also be interesting to discover how many of this company of missionaries returned to Europe when the Mongol Empire broke up, and what they did after their return.

19. In 1305 John of Monte Corvino had seen no European for twelve years, though a "Master Peter," a "great merchant," had accompanied him to Cambaluc. It was probably between 1310 and 1320 that commercial intercourse on a larger scale began.

20. See note 9.

CHAPTER XVII

PERSIA, THE CROSSROADS BETWEEN THE EAST AND THE WEST

1. Ghazan Khan in 1295 had proclaimed himself independent of the Peking court, but these seals indicate that even in 1305 the independence was not quite complete. At least the Great Seal was still derived from China.

2. The earlier of the two letters in the Paris archives from the Persian Ilkhans is dated 1289. The seal impressions are in red ink and consist of Chinese characters. They are 5½ inches square. The second letter with similar seals is dated 1305. A duplicate of this was sent to

Edward II. of England (Yule, *Marco Polo*, Cordier edition, vol. 2, p. 444.)

Recently, in the archives of the Vatican, a whole series of other letters from the Ilkhans of Persia has been found. A list of these is contained in an article by Pelliot in a recent number of the Revue de l'Orient Chrétien (see Bibliography), and the documents will be published in later numbers of the same review.

3. Yule, *Marco Polo*, Cordier edition, vol. 2, p. 477, note.
4. *Ibid.*, vol. 1, pp. 119–121. Two letters from the Nestorian patriarch Mâr Yahb-alahâ III. (Rabban Marcos) to the Pope, dated 1302 and 1304, have recently been found in the archives of the Vatican. The text is Arabic and the seals Uigur. Pelliot has announced his intention of publishing these two letters in a forthcoming number of the Revue de l'Orient Chrétien.
5. The name of this Chinese general was Kuo K'an (Mongol, Kuka Ilka). He commanded the right flank of the Mongol army in its advance on Bagdad and remained in charge of the city after its surrender. His life in Chinese has been preserved. E. Bretschneider, *Mediaeval Researches*, vol. 1, p. 4.
6. Yule, *Marco Polo*, Cordier edition, vol. 1, page 76, note.
7. H. H. Howorth, *History of the Mongols*, Part III, p. 629.
8. For a fuller narrative of the relations between Venice and Persia during this period, see H. H. Howorth, *History of the Mongols*, Part III, pp. 631–633. It is evident that during a part of this time Venice maintained consuls not only at Tabriz but in other cities of Persia as well.
9. There is no literary record of the Egyptian block printing activity described in the next chapter. We have only the prints themselves as evidence.
10. The word appears both in Chinese character (鈔 *ch'ao*,) and in Arabic transliteration. This character was first applied to paper money in the Sung Dynasty, and is still the usual word used.
11. It has been calculated that 1294 was the very year that Marco Polo was in Tabriz. Malcolm has even suggested that Marco had something to do with proposing this issue of paper money. Yule, *Marco Polo*, Cordier edition, vol. 1, pp. 428–429, note.
12. Yule, *Marco Polo*, Cordier edition, vol. 1, pp. 428–429, note; Browne, *Persian Literature under the Tartar Dominion*, pp. 37–39.

13. For the early history of paper money in Europe, see chapter 21, note 6.

14. Ghazan had been governor of Khorassan in 1294 at the time of the issue of paper money. He refused to have any *ch'ao khanahs* (paper money offices) opened in his province. Yule, *Marco Polo*, Cordier edition, vol. 1, pp. 428–429, note.

15. Rashid-eddin was made vizier about 1298. He presented his Great Universal History (*Jami'u't-Tawárikh*) to Uljaitu, Ghazan's successor, in 1310 or 1311. He was put to death by Uljaitu's successor, Abusaid, on Sept. 13, 1318. For further details of his life and work, see H. H. Howorth, *History of the Mongols*, Part I, Preface; E. G. Browne, *Notes on the Contents of Tarikh-i-Jahan-Gusha*, Journal of the Royal Asiatic Society, 1904, p. 28; E. G. Browne, *Persian Literature under the Mongol Dominion*, pp. 68–75; Henry Yule, *Cathay and the Way Thither*, Cordier edition, vol. 3, pp. 108–133.

16. Translation of E. G. Browne (Edward G. Browne, *A History of Persian Literature under Tartar Dominion*, Cambridge, 1920, pp. 102–103.) Browne's translation is from the *Ta'ríkh-i-Banákatí* (see note 19, below) which appeared in 1317, and which took over this description from Rashid's history. For translation of the same passage in French, made directly from Rashid, see Jules Klaproth, *Lettre à M. le Baron A. de Humboldt sur l'invention de la boussole*, Paris, 1834, pp. 131–132. Klaproth's translation does not differ essentially from that of Browne.

17. See chapter 15.

18. For full list of these twenty-six MSS., see E. G. Browne, *Suggestions for a completed Translation of the Jami'u't, etc.*, Journal of the Royal Asiatic Society, 1908, pp. 33–37.

19. *Rawdatu Uli'l-Albáb fí tawarikhi'l-Akábir wa'l-Ansáb* by Abu Sulaymán Da'ud of Banákat in Transoxiana, completed in 1317, and usually known as the *Ta'ríkh-i-Banákatí*. The author was contemporary with Rashid and was poet-laureate under Ghazan Khan from 1301 to 1302. Five of the nine sections of his history are devoted to non-Moslem peoples and bear the titles, *The Jews*, *The European Nations, including the Roman Emperors and the Popes*, *The Indians*, *The Chinese* and *The Mongols*. The section on Europe has references to Portugal, Poland, Bohemia, England, Scotland, Ireland, Lombardy, Paris and Cologne. See E. G. Browne, *A History of Persian Literature*

under Tartar Dominion, pp. 100–102. Apparently it was through Banákatí that Rashid's description came to the attention of Gerard Meerman, who quoted from it in his *Origines Typographicae* in 1765. See Introduction, note 2.

CHAPTER XVIII

BLOCK PRINTING IN EGYPT DURING THE PERIOD OF THE CRUSADES

1. In addition to the prints at Vienna, there are six of similar character in the University Library at Heidelberg (first detected as block prints by Grohmann in 1922), one in the Neues Museum at Berlin, and several in Cairo. I have been informed that there are also two similar prints in the British Museum, but have been unable to find them there. One of the block prints at Heidelberg is on parchment. All others are on paper.
2. The approximate date 1350 as *terminus ad quem* is certain, for the quantities of dated documents (written) end at this time and it is clear that nothing was added later. It is also clear that some of the block prints date from near the end of this period, as they are in forms of script that did not exist earlier. The dating of the earliest prints is more difficult. No. 946 (the one here reproduced) is clearly, from the point of view of script, the oldest. This is dated by Karabacek as tenth century. Moritz comments on this "earlier than 900 rather than later." Dr. Grohmann (in reviewing a tentative draft of my chapter) writes, "Number 946 should from the paleographic standpoint be dated in the eighth century A.D. If Karabacek and I have assigned this print to the tenth century, it is a concession to the feeling that at so early a period the Koran could not have been printed on paper. . . . Number 948 however, like all the other prints, including charms, is certainly later than No. 946, which thus represents the oldest print." This is the paleographic evidence. After studying other sides of the question, I cannot help wondering whether the conclusions based on paleography are final. There is always the possibility that the blocks were cut at a later date in imitation of early manuscripts. All that can be said with certainty about date is that

the whole collection is earlier than the middle of the fourteenth century.

3. No. 946 in the Erzherzog Rainer Collection.
4. No. 948 in the Erzherzog Rainer Collection.
5. With some of the bits of printing in Egypt, there were found fragments which seem to bear clear traces of Turfan art, among them a tiny but beautifully colored Buddha.
6. The earliest recorded importation of Turkish slave-mercenaries to Bagdad was in 673. In 808 they are first heard of in Egypt. From about 828 to the end of the Caliphate, the Caliphs of Bagdad were little more than playthings in the hands of their Turkish bodyguard. In 830 Egypt was given as fief to a Turkish general. From this time down to 1517, except during the years 969–1171, Egypt was under the rule of individuals of Turkish origin. Till 868 these rulers were Turkish generals in the employ of the Bagdad Caliph—one of whom in 856 started the practice of filling all the chief offices in the state with Turks. From 868 Egypt became a separate power under Turkish dynasties, usually including as one of its provinces such part of Palestine as was not occupied by the Crusaders. To maintain this power a Turkish army was necessary, for which a constant stream of recruits from Central Asia kept pouring in.

CHAPTER XIX

PLAYING CARDS AS A FACTOR IN THE WESTWARD MOVEMENT OF PRINTING

1. "Hung Tsun-hsü, writing in the Sung Dynasty, states, 'Backgammon had its origin in western India, spread into Wei (the name of North China during the period of the Three Kingdoms, A.D. 220–265), became general under the Liang, Ch'en, Wei, Ch'i, Sui and T'ang Dynasties, and up to the time of the emperor T'ai Tsung of our own Dynasty'." Karl Himly, *Die Abteilung der Spiele in 'Spiegel der Mandschu Sprache,'* T'oung Pao, 1898, vol. 9, pp. 299–321. According to Himly, there is a reference to backgammon in Japan in the Nihongi under date 690–697, and there are other Chinese and Japanese authorities who agree that backgammon came from India.

2. From very early times (at least from the middle of the Chou Dynasty) there had been a game of *ch'i* in China which is commonly translated chess. The history of this game is discussed by E. H. Parker in the China Review for 1889 (vol. 18, page 54). This game has survived under the name of *wei ch'i*. It is much more complicated than our chess. The history of the Indian game of *hsiang ch'i* or "elephant chess," which is more analogous to our own game, has been traced by Himly in Chinese and Manchu sources. (T'oung Pao, March 1897, vol. 8, pp. 155–180; and Zeitschrift der Deutschen Morgenlandischen Gesellschaft, vol. 41, pp. 461 ff.) According to Himly, the first reference to the Indian game in Chinese sources is in the year 569, and is quoted in the *T'ai-p'ing-yü-lan* Encyclopedia of 984. It seems to have migrated from India both to China and to Persia in the sixth and seventh centuries, and to have reached Japan also before the end of the seventh century. The above conclusions must be taken tentatively. Confusion of terms between the Chinese and Indian games makes it difficult to trace the early history of chess in China with certainty. Parker finds a certain amount of indication that *hsiang ch'i* was not an importation from India but had an independent Chinese origin, going back possibly even farther than *wei ch'i*. In any case it was in all probability the Indian game rather than the Chinese that was back of the Arabic game that was in turn back of European chess.

Some points in the Chinese game as played to-day are of historic interest. The castle, called *chü*, chariot, is the most powerful piece, as with certain limitations, it can jump over intervening pieces like the knight. The knight's move is the same as ours, and the piece is called *ma*, horse. There is an additional piece called *p'ao*, a word which in modern Chinese is written with a fire radical and means "cannon," but which before the invention of gunpowder was written with a stone radical and meant a mechanical device for hurling stones. The transitional form of warfare finds an echo in chess, for the blue *p'ao* is written with a stone radical, (砲) while the red corresponding piece has the fire radical (炮). Likewise the bishop, which has the same move as ours, retains on the blue side of the board its Indian name of "elephant" (象), while on the red side it changes to a word pronounced exactly the same but meaning "prime minister"

(相). As in the Indian, Arabic and early European games, there is no queen.

3. See Encyclopedia Britannica, article *Polo*.

4. "In the annals of the Ch'i Dynasty under the date 501 A.D. (中興) it is stated: 'According to T'ao Shih-hsin (陶士行) dice (樗蒱) are a foreign game, which Lao-tzŭ found when he was in the land of the Western Barbarians (胡). In recent years officials are playing it very much. How does it come about that they waste their time with foreign things and do not help their own country?'" *T'u-shu-chi-ch'êng* Encyclopedia, section entitled 藝術典, subsection 博戲部 (book 807, folio 6).

5. Various origins of the names, *yeh-tzŭ-hsi* (葉子戲) and *yeh-tzŭ-ko*, (葉子格) "leaf-game," "leaf dice" or "sheet-dice," have been suggested. According to the *Tz'ŭ-yüan* Encyclopedia, quoting from Kuei T'ien-lu, "The books of the T'ang Dynasty were all in the form of rolls. Later came pages like those in use to-day. When it was necessary to have any written matter ready for quick examination, it was made on pages. In the same way, in order to have dice in a convenient form, they were made on cards, and this was the origin of the word, *yeh-tzŭ-ko* (from *yeh-tzŭ*, a leaf or page). Before the end of the T'ang Dynasty there were already such 'leaf-dice'." From other sources it is known that the transition from rolls to paged books was due to the influence of printing. It is a natural supposition that the first putting of dice on cards was due to the same influence. There are other theories of the origin of the word *yeh-tzŭ-hsi*, some connecting it with a man or woman by the name of Yeh, but the theory here given is the one most generally received.

The conclusions here stated with regard to the origin of playing cards, dominoes and Mah Jongg are based on somewhat obscure sources, and, while the writer believes them to be correct, he states them with considerable reserve. They are the conclusions that he has come to after reading the long article on early games in the *T'u-shu-chi-ch'êng* Encyclopedia and shorter articles in the *T'zŭ-yüan* Encyclopedia, and comparing the citations from certain of the early writers quoted in these articles. It may be that the influence of paper money on the origin of playing cards should be more stressed. For an able

exposition of this view see Stewart Culin, *The Game of Ma-Jong*, Brooklyn Museum Quarterly, October, 1924.

6. For Rémusat's statement and for translation of the passage in the *Chêng-tzŭ-t'ung* Encyclopedia from which it is taken, see W. H. Wilkinson, *Chinese Origin of Playing Cards*, American Anthropologist, 1895, vol. 8, pp. 61–78.
7. "According to the History of the Liao Dynasty, the emperor Mu Tsung, in the 19th year of the period *Ying-li* (969) . . . made reference to the game of cards when he said to his ministers, 'Games of cards were played in the house of Duke Ch'ien, and in that very year in the second month he was killed by Siao-ko, ruler and subjects became victims of barbarity, and misfortune followed misfortune. Yet such unlucky objects are now held in the hand daily by scholars and officials. Is not that the following of an evil example?' " *T'u-shu-chi-ch'êng* Encyclopedia. See note 4 (above) for full reference.
8. This is the conclusion reached after conversation on the subject with such eminent Arabists as Dr. Grohmann of Prague, Dr. Margoliouth of Oxford, and Dr. Moritz of Berlin.
9. It is probable that the first mention of chess in Europe is in the year 1061, and thus antedates by a few years the first Crusade. The Crusades and the Christian conquest of Spain had the effect of spreading the game through Europe.
10. The very early introduction of chess into England is indicated by the great variety of uses of the word "check" (including "bank check" and the verb "to check") all of which go back to chess and so ultimately back to the Persian word "shah."
11. Here are included the supposed references to cards in England in 1240 and 1278, in Germany in 1291 and 1300, in France in 1328 and 1376.
12. Brit. Mus. MS. Egerton 2,419.
13. Prohibition of cards by John I. of Castile.
14. Account book of Jeanne, Duchess of Brabant, May 14, 1379.
15. "In the year 1379 was brought into Viterbo the game of cards, which comes from the country of the Saracens, and is with them called *naib*." Covelluzo of Viterbo, writing in the fifteenth century, on the authority of a chronicle of one of his ancestors.
16. "Given to Jacquemin Grigonneur, painter, for three packs of cards (jeux de cartes) in gold and other colors, ornamented with various

devices, for the diversion of the king, 75 sous of Paris." Accounts of the treasurer of the household of Charles VI. of France, 1392 or 1393.

17. The earliest references to playing cards give as a rule no clear indication of the method of manufacture. Even the order given in 1392 for three packs of cards for the King of France, which uses specifically the word painter, gives no suggestion what kind of cards were being used by the common people, for painted cards were used by royalty long after printing began. The earliest cards extant—some printed, some painted, some printed in outline and filled in with a stencil, also shed little light on the question, for they cannot be dated. They indicate merely that cards were being made in several different ways, presumably at the same time, according to quality and price. Printing in its beginnings—whether of pictures, texts or cards—was always the poor man's friend.

18. In 1441 the Council of Venice issued the following decree:

"Whereas, the art and mystery of making cards and printed figures, which is in use at Venice, has fallen to decay, and this in consequence of the great quantity of printed playing cards and colored figures which are made out of Venice, to which evil it is necessary to apply some remedy, in order that the said artists, who are a great many in family, may find encouragement rather than foreigners: Let it be ordained and established, according to the petition that the said masters have supplicated, that from this time in future, no work of the said art that is printed or painted on cloth or paper—that is to say, altar-pieces, or images, or playing cards, or any other thing that may be made by the said art, either by painting or by printing—shall be allowed to be brought or imported into this city."

19. From the decree of 1441 several things are evident, first, that at some considerable time before 1441 the printing of playing cards had been a thriving industry in Venice; second, that both printed and painted cards coming from some other place had interfered with that industry; and, third, that the printing of playing cards and the printing of saint images were closely connected. The source of these imported cards is indicated by an entry in the Red Book of Ulm in southern Germany, according to which, at just about this time playing cards were being shipped in barrels to Sicily and Italy. The city records of Augsburg and Nuremberg mention card makers in 1418, 1420, 1433, 1435, and 1438. These cities are known to have been the

places where the early saint pictures were being made by block printing at just the same time. This, together with a careful study of the words used for card makers in the German records, has led practically all authorities on the subject to the conclusion that, from the time these records begin, some at least of the cards were printed. Certain investigators of the subject go much further. From the great number of cards burned at Rome in 1423, from the prohibition of workmen playing cards in 1397 (indicating cheap production), and from other evidence, they come to the conclusion that, from the time of the earliest records of cards in Europe, printed as well as stencilled and painted cards were used, and that the printing of cards preceded and paved the way for the printing of religious pictures. The evidence is inconclusive. The best that can be said is that the printing of cards and the printing of religious pictures were closely connected, that they were often, if not always, carried on by the same persons, and that it is impossible to say which started earlier, the probability being that the two sorts of printing developed side by side at about the same time.

20. A theory to the effect that cards were introduced directly from China and not through the Arabs, is recorded by Valère Zani, an Italian writer who died in 1696, in the following statement, "The Abbé Tressan (a French missionary to Palestine, 1618–1684) showed me when I was at Paris a pack of Chinese cards and told me that a Venetian was the first who brought cards from China to Venice, and that that city was the first place in Europe where they were known." On what authority Tressan based his statement has not been discovered.

21. See Covelluzo above (note 15). Some authorities point to Spain as the avenue by which cards entered Europe, noting the Arabic origin of the Spanish word *naipes*, as well as the Italian *naib*. It seems likely that cards entered by several avenues.

CHAPTER XX

THE PRINTING OF TEXTILES

1. On account of the climate, no Indian textiles of early date have survived, but it seems not unlikely that even the Egyptian prints dating from Roman times show Indian influence. These earliest prints from Egypt are on cotton.

2. For fuller description of the Japanese method, see G. A. Audsley, *Ornamental Arts of Japan*, vol. 1, part II, pp. 7–9. If the negative printing process was used in connection with a mordant, the union between dye and mordant was probably produced by steaming after the printing. In this Japanese process it was possible to apply several colors in one printing. In this case it was necessary that each unit of color be separated from the other colors by a cloison, an unprinted zone where wood was clamped against wood. Such unprinted zones seem to appear also in most if not all of the prints found in Central Asia.
3. R. Forrer, *Die Kunst des Zeugdruckes*, p. 8.
4. R. Forrer, *Die Zeugdrucke der byzantischen, romanischen, gothischen und spätern Kunstepochen*, pp. 11–13. These Egyptian prints are resist prints on cotton.
5. R. Forrer, *Die Zeugdrucke der byzantischen*, etc., pp. 13–14. The print from Arles is said by Forrer to be linen (?). It has a pale blue resist and is probably imported from Egypt. The Quedlinburg fabric is a pigment print and is said by Lessing (*Jahrbuch der Preussischen Kunstsammlungen*, 1, 120) to be Sassanian.
6. Kamesō (see Bibliography), pp. 4–5. Kamesō gives reasons in detail why the dates on these textiles must have been a part of the original blocks, and also indicates extensive Japanese bibliography on the subject.
7. Stein, *Serindia*, see index, "*Silk, printed.*" Note especially the plates in vol. 4. It is impossible to determine exactly the dates of the Tun-huang fabrics. It is certain that they are all earlier than 1000 and later than 500. They probably date in the main from the latter part of this period.

   The printed fabrics from Tun-huang in striking contrast to all the printing on paper from the same place, are entirely non-religious in character. Animal designs predominate, especially dogs, deer, and horses. There is no right and wrong side as in our prints, the dye having thoroughly penetrated the fabric. See chapter 6.
8. Cennino Cennini was born about 1372. He was a pupil of the painter Gaddi in Florence, from 1384 to 1396. The book containing this description is entitled *Trattato della Pittura* (see edition of Milanesi, Florence, 1859). The description of textile printing is quoted in full in Forrer, *Die Kunst des Zeugdruckes*, pp. 11–15, and an abstract of it is given in Forrer, *Die Zeugdrucke*, etc., pp. 22–23.

9. The earliest textile printer mentioned by name in Europe is Jan de Printere of Antwerp (1417), approximately contemporary with the earliest block printers on paper named in German records. Forrer, *Die Zeugdrucke*, etc., p. 22.

10. The most remarkable of these is a picture found in a church at Enskirchen (but probably made at Cologne), usually called from the inscription that forms part of the design, *Gloria Laus Deo*. The picture is 30 by 27 cm. in size. It represents a number of angels engaged in praise. This picture is the nearest approach made by textile printing to the image prints on paper. It dates probably from early in the fifteenth century. Another early picture print is the famous printed hanging of Sitten.

11. Aside from a few playing cards of uncertain date, the exceptions to this rule are very rare. There are no exceptions among the early block prints of Japan, of Turfan or of Egypt. There are, so far as I am aware, just three fragments of a non-religious character from Tun-huang, and almost none from Europe.

12. For very much of the material contained in this chapter, the writer is indebted to conferences with Prof. Rudolf M. Riefstahl, of the University of New York, whose long and careful study of Oriental textiles is well known. The following additional note from Dr. Riefstahl came too late to be incorporated in the body of the chapter:

"The printing technique in Europe practised during the twelfth and thirteenth centuries is different from the Oriental techniques, being one of carrying pigments with a vehicle on the fibre, while the Oriental techniques command also the better process of forming a pattern in a fabric by the use of dyes, penetrating the textile fibre by the resist or the mordant process.

"Textile printing in Europe may originally go back to an Eastern influence that manifested itself during the Imperial Roman period or perhaps earlier. But the medieval European technique emerges from the late Roman technique and is certainly not influenced by the Chinese art of textile printing.

"The Eastern techniques of resist dyeing and mordant dyeing for pattern producing became known in Europe only after the discovery of the sea route to the Indies. A Dutch painter by the name of Pieter Clock, living in the second half of the sixteenth century is said to have first used the resist dyeing process in Europe for the production of

patterned fabrics. The Oriental techniques therefore cannot have been instrumental in bringing forward the invention of printing in Europe.

"However, the practising of printing in China may have opened perspectives to European travellers for the use of block printing, that otherwise might have come about only later.

"It is perfectly logical that textile pattern printing in the medieval process suggested not only the reproduction of textile repeat designs but also pictorial representation like the compositions in the famous printed hanging of Sitten (second half of fourteenth century).

"Very often, however, the forthcoming of a germinating idea is held back by the slowness of human logic, and is, on the other hand, stimulated by an instructive example. Kaolin was since the times of the diluvium in the European soil. Nothing prevented potters from trying this clay for the purpose of pottery making. But kaolin was discovered and experimented with only after Chinese porcelain had created the desire for an improved resonant white and translucent form of ceramic ware.

"In the same way Europeans might have found quite by themselves the use of the textile printing technique for the production of pictorial scenes for wallhangings and religious images on linen, later for the same on paper, and finally for providing those images with legends cut in the wooden block. But such a process was undoubtedly speeded up by a considerable number of priests, teachers and missionaries, having seen in China the use of religious images printed with the block process on paper. They might very likely have encouraged this use of an old established technique for a new purpose fitting admirably into the purposes of the church."

CHAPTER XXI

BLOCK PRINTING IN EUROPE

1. For Venetian decree of 1441, see chapter 19, note 18.
2. There has been a tendency in recent years among certain writers to minimize the importance of block printing as the forerunner of typography. These writers make much of the binder's stamp and other

devices that directly suggested type. But they prove merely that typography had two parents instead of one. Block printing suggested the idea that books could be printed. The binder's stamp, etc., suggested a better way of doing it.

3. The fact that most manuscript books—especially those that have been preserved—were made for the wealthy means that a large proportion of the books that are extant, even from the end of the fourteenth century, are still on parchment. Paper was used for more temporary and perishable things.
4. T. L. De Vinne, *The Invention of Printing*, page 41.
5. A careful examination of the defects in certain of the early block books which indicate cracks in the blocks, shows that two pages were printed from each block, and that these pages were bound back to back. This conforms exactly to the Chinese practice. See De Vinne, *The Invention of Printing*, page 202.
6. See chapter 20, note 13.
7. At first sight it may seem strange that paper money did not feature in early European printing. It is the one form of Chinese printing that almost all European writers noticed. It is the one form which we know was carried on in Persia. Yet there is no record of any paper money in Europe till the issue of 1658 in Sweden. This is the more remarkable in view of the fact that Europe seems to have come just to the edge of the use of paper money and then stopped. In addition to the leather or fur money of Mongol Russia (see chapter 16, note 3), there are at least four issues of leather money recorded in Europe during the twelfth and thirteenth centuries. Such leather money as guarantee for future payment was given out by (1) the Venetian Doge, Domenico Michieli, in the wars of 1122 to 1126; (2) King John of England during the Barons' War; (3) Louis IX. of France during his imprisonment; (4) Emperor Frederick II. during the siege of Faënza in 1240. It may well be that the complete failure of the issue of paper money in Persia and of those issues in China which took place during the time of most frequent European intercourse, proved a deterrent rather than an incentive to European imitation. (For a clear summary of the issues of leather money in Europe, see A. L. von Ebengreuth, *Allgemeine Münzkunde und Geldgeschichte*, Munich and Berlin, 1904, page 36.)
8. See chapter 16, note 9.

CHAPTER XXII

THE INVENTION OF MOVABLE TYPE IN CHINA

1. "In the Tsin (Later Tsin) Dynasty, epoch *T'ien-fu* (936–943), there were copper plate books (銅 板 書)." Yo Ko (岳 珂), Sung Dynasty, in *Chronology of the Nine Classics and the Three Commentaries*, as quoted in *Tz'ŭ-yüan* (辭 源), section 戌, page 27.

"I saw in a relic shop pieces of bronze about two or three inches in length, and on them were cut poems of Tu Fu and prose quotations from the essays of Han Yü. The characters were reversed, so that I did not understand what these pieces of bronze were for. I was told that they were standards for printing and that they were distributed about the empire during the first year of the emperor T'ai Tsung of the Sung Dynasty (976)." Ts'ai Ch'êng (蔡 澄) in *Chi-ch'uang-ts'ung-hua* (鷄 窗 叢 話), as quoted by Liu An, page 7. Liu An finds evidence that this bronze plate came from Szechuen.

"During the period *Ming-tao*, the third year (1035), money was given out from the imperial treasury for the conversion of the *hui-tzŭ* notes, the *copper plates* were withdrawn and it was forbidden to print more." *Tz'ŭ-yüan*, section 戌, page 27.

2. 畢 昇.

3. The statement is made by Julien that Pi Shêng was a smith. Julien's reference to the section in *Mêng-ch'i-pi-t'an* is apparently incorrect and I have been unable to find the passage.

4. 膠 泥.

5. This seems to refer not to the thickness (i. e., height to paper) of the type as a whole, but rather to the thickness to which the type was cut away to make the character stand out. Hülle has suggested that this sentence refers not to the type itself but to a type mould or matrix. There is nothing else in the passage to suggest that a mould was used.

6. 印, *yin*, literally seal.

7. The text reproduced by Julien reads *shih-hui* (石 灰), lime, and is so translated by him. The texts of 1631 and 1696, which are apparently the oldest now extant, read *chih-hui* (紙 灰), paper ashes.

8. Probably a frame for dividing columns and margins.

9. Lit., "While the one form was being stamped and rubbed (印刷)." This is the ordinary expression for printing, an expression recalling the fact that the impression is made by lightly rubbing with a brush, just as our word *print* in its origin suggests a press.

10. Lit., "for common characters like 之 and 也."

11. This was the earlier method for arranging Chinese characters in a dictionary. In lieu of alphabetic order, which was manifestly impossible in a non-alphabetic script, all words that rhymed were placed together, and rules were devised for arranging the words within each rhyme group. It is upon this rhyme system that the new phonetic alphabet, whose introduction into all schools began in 1921, is based.

12. Text of 1696 edition is here followed, as the 1631 reading, 文理, seems to have no meaning.

13. Text of 1696 edition reads "his followers."

14. Shên Kua (沈括), *Mêng-ch'i-pi-t'an* (夢溪筆談), *Chi-ku-ko* (汲古閣), edition of 1631, book 18, section 9. The edition of 1696 in the *Pai-hai* collection (vol. 4) has been compared, and, though there are six slight textual variations, none of them affect in any way the meaning, except the one in the last sentence, to which attention is called above (note 13). Julien has apparently used still a third text, which is practically identical with that of 1696, except for the use of *lime* instead of *paper ashes*. The translation that I have given is from the text of the 1631 edition, though the 1696 edition, the French version of Julien and the German version of Hülle have been carefully compared. The passage has apparently not previously been translated into English.

15. A Korean writer of the latter part of the fifteenth century in a resumé of the history of movable type, contained in the preface of the *Ch'ên-chien-chai* (陳簡齋) collection of poems (quoted by Kamesō, page 128), says, "The movable type method was begun by Shên Kua and brought to perfection by Yang Wei-chung (楊惟中)." The reference to Shên Kua is evidently an error due to confusion of the inventor with the one who first described the invention. Of Yang Wei-chung nothing further is known. Satow quoting from a Japanese book by Kondou, entitled 右文古事, refers to him as Yang K'ê (楊克).

16. Wang Chêng (王禎), *Nung-shu* (農書), *Wu-ying-tien* edition (武英殿聚珍板書農書), appendix. The *Nung-shu* was first published in 1314. By the reign of Ch'ien Lung (1736–1796), no copies of this original edition could be found. But fortunately it had been copied by hand in the great thesaurus of literature known as the *Yung-lo-ta-tien* during the reign of Yung Lo (1403–1425), and from this manuscript it was republished during Ch'ien Lung's reign by the *Wu-ying-tien* printing office, and a *Nung-shu* of this edition is in the Library of Congress at Washington. (See W. T. Swingle in *Report of the Library of Congress*, 1921–1922, pp. 184–186.) The *Nung-shu* in the Bibliothèque Nationale at Paris is incomplete and lacks this appendix. A Ming Dynasty reprint of the *Nung-shu* has apparently been located in a library in Nanking, which is also incomplete. Liu An has reproduced the text of the *Wu-ying-tien* edition, though with a number of misprints, in *Chung-kuo-tiao-pen-yüan-liu-k'ao*, pp. 40–43. The translation here given is from the original *Wu-ying-tien* edition at Washington.

17. This was the generally accepted view of those Sung Dynasty writers who disregarded the earlier Buddhist printing. See chapter 8.

18. The reading 錢, cash, is a misprint in Liu An. The *Wu-ying-tien* edition has correctly 鐵, iron.

19. 瀝青. Shên Kua's account called this a mixture of pine resin, wax and paper ashes.

20. 鑄錫.

21. The correct reading is not 墨, ink (as in Liu An), but 木, wood. It will be noted that this paragraph contains a summary of the whole description. The next paragraph goes back to the beginning and gives the description in detail.

22. Lit., "for the auxiliaries 之, 乎, 者 and 也." These are among the words most commonly met in Chinese writings.

23. The word translated *revolving table* here and throughout the passage is 輪, *lun* (lit. *wheel*). The words translated *leg of the table* are 輪軸, *lun-chou* (lit. *axle of the wheel*). This arrangement for setting type called *the wheel* was evidently a round table, revolving upon a central leg, the top being divided into compartments and sub-compartments for the large number of type needed in a non-alphabetic script. This

sort of "lazy-Susan" would seem to be somewhat of an improvement on the modern system of Chinese type-setting, where the compositor has to walk about an entire room to find the requisite type.

24. 臼, *chiu* (lit. *mortar*).

25. 鑽, *tsuan* (lit. *augur* or *drill*).

26. See chapter 5. Once the type is set, the process seems not to differ materially from that of block printing.

27. 縣 志, *hsien-chih*. This was the *hsien-chih* of the magistracy of Ching-tê (旌 德) in the district of Hsüan-chou (宣 州).

28. Late survivals of movable type of clay in Korea and Japan would seem to indicate that the process may have had more vogue than literary references would lead one to suppose. See M. Courant, *Bibliographie coréenne*, introd., p. 49.

29. "In a Sung edition of the *Mao-shih* (the *Book of Poetry* with Commentary by Mao), in the section entitled 唐 風, the character 自 appears lying on its side, which is proof of the fact that the book was printed with movable type." Comment in the *T'ien-lu-lin-lang* (天 祿 琳 琅), as quoted by Liu An, page 39. The *T'ien-lu-lin-lang* was a collection that appeared in the year 1775 of works of the Sung, Yüan and Ming Dynasties. Additions were made to it in 1797.

30. The last paragraph of Wang Chêng's account would indicate that his special method of using wooden type was not found altogether practical. This does not apply to the use of wooden type in general.

31. A few of these type present a further difference. They are reversible. One word is cut in the top and another in the bottom of the same type.

CHAPTER XXIII

THE GREAT EXPANSION OF MOVABLE TYPE PRINTING IN KOREA

1. 鑄 字.

2. *Kao-li-shih* (高 麗 史), section entitled *Pai-kuan-chih* (百 官 志), as quoted by Kamesō, page 127.

3. This statement is contained in a photograph copy in the Preussische Staatsbibliothek of an anonymous Japanese document, accompanied by a German translation by the Korean interpreter Yi Djung Sun,

which was sent from Korea with some Korean printed books that were on exhibition at the Bugra Exposition in Leipsic in 1914. This statement is probably based on Yi Kyoobo, a Korean writer who lived from 1169 to 1241, and who, according to Dr. J. S. Gale of Seoul, described movable type. I have been unable to obtain access to Yi Kyoobo's work. It seems improbable that the type which he described were of metal.

4. The book in question is *The Family Sayings of Confucius* (孔子家語), British Museum, No. 15201, C 13. It has been the occasion of considerable controversy. Satow, who presented the book to the British Museum, makes out a strong case for its having been actually printed with movable type, partly in 1317 and partly in 1324. Later writers have largely taken the opposite position. See:
   Ernest Satow, *On the Early History of Printing in Japan*, Transactions of the Asiatic Society of Japan, 1882, page 62.
   Maurice Courant, *Bibliographie coréenne*, pp. xlvii—xlviii, 148–149.
   W. E. Griffis: *Corea, the Hermit Nation*, page 67.
   Le royaume solitaire. Revue des Deux Mondes, Feb. 15, 1884, page 894.
5. The statement in the article on *Typography* in the Encyclopedia Britannica (Eleventh edition) to the effect that there is a book in the British Museum printed with type in Korea in 1337, is not correct. It is probably a misprint for 1317 and refers to the book mentioned above (note 4).
6. The more readily understood English word "preface" is used in this chapter, though the "preface" in these Korean works appears at the end of the book, and is hence called by some writers, "postface."
7. Annals of the Yi Dynasty, chapter 3 (from German translation of Stübe).
8. According to Stübe (page 93, see Bibliography), a further contemporary reference to this first font is contained in a laudatory statement by the Korean scholar, Kwon Geun (died 1409), ascribing to the king all honor for the invention.
9. *Sun-tzŭ-shih-i-chia-chu* (孫子十一家註).
10. The first year (1403) of Yung Lo, emperor of China, was the same as the third year of T'ai Tsung, king of Korea.

11. According to Stübe (page 92), this much of the preface—the king's proclamation—also appears in the Korean Encyclopedia, chapter 242.
12. The translation is that of Satow, revised by comparison with the Chinese text as given by Kamesō, page 127.
13. Evidently a mistake for Pi Shêng. The man who first described the invention has been confused with the inventor. Of Yang Wei-chung (楊惟中) nothing further is known. He is called Yang K'ê (楊克) by Satow in a translation of this same passage from a Japanese work by Koudou, entitled 右文古事 (Satow, p. 64).
14. Preface to the *Ch'ên-chien-chai* (陳簡齋) collection of poems, edition published in Korea with movable type. From text of Kamesō, page 128.
15. M. Courant, *Bibliographie coréenne*, p. 45.
16. It is possible that there was a second font between 1403 and 1420. In the preface of the Korean edition of the *History of the Earlier Han Dynasty*, there is the statement: "In the eleventh month of 1413 the king ordered his officer Li Tsang (李藏) to cast a fresh set of type, which was finished within the space of seven months." There is however some confusion about dates, and it seems likely that this font was identical with the one described below under 1420. The museum at Seoul has type which they claim belong to a font of 1416.
17. The first preface of this book is identical with the preface of the books published in 1409 and 1434 and has already been translated (see above).
18. *Li-tai-chiang-chien-po-i* (歷代將鑑博議).
19. Satow's translation. Owing to the confusion of Korean orthography, Chinese romanization (Giles) has been substituted for Satow's Korean spelling in this and other quotations.
20. Third preface of the *Li-tai-chiang-chien-po-i* (see above, notes 18 and 19). The preface is dated December, 1436, and the book itself September, 1437. The two previous prefaces of the same book are translated above. Courant makes the statement (introduction, page 45, authority not given) that this font of 1434 was made of lead.
21. This statement that a book was produced in 1434 in Korean alphabet and movable type is contained in Courant's *Bibliographie coréenne*. The book is numbered by him 253 and romanized, *Sam kang haing sil to*.

22. There is another kind of early Korean type-printing consisting of very roughly printed books, and there is a tradition among Korean scholars that they were printed from type of baked clay, a survival of Pi Shêng's method. Such clay type also survived to a late period in Japan. See Courant, introduction, page 49.
23. T. L. De Vinne, *The Invention of Printing*, New York, 1876, pp. 67–68.
24. There is a theory held by many recent investigators that the earliest type made by Gutenberg at Mainz were also made from wooden models and sand or clay moulds. For discussion of this theory see Encyclopedia Britannica, art. *Typography*, pp. 536–538.
25. From German translation of Stübe, page 93. The romanization of the name of the author is Stübe's.
26. These type were obtained by the Museum of Natural History from Homer B. Hulbert (author of *The History of Korea*). They are described by Mr. Hulbert in an article in Harper's Magazine (June, 1899, vol. 99, pp. 102–108). In answer to a question addressed to Mr. Hulbert with regard to the provenance of these type, I have received the following reply: "Among the archives of the Educational Department in Seoul in 1897 I found the remnants of all three of these issues [the three issues of the first half of the fifteenth century]. Of the oldest set there were only fifty-three pieces left, and these are the ones which the Minister of Education gave me and which I placed in the Natural History Museum. There is no actual *prima facie* evidence that these are the actual first pieces made, but all the circumstantial evidence points to this fact." The curators of the Seoul Museum, to whom I sent impressions of the New York type for comparison (1924), very kindly returned to me impressions of the type of 1403, 1416, 1420, and 1434, which are in their possession, and also of those of later date, and came to the conclusion on the basis of their examination that the type in New York probably belong to one of the fonts that were cast at the end of the eighteenth century. The whole question of the dating of Korean type now extant in museums needs further investigation.
27. There were books printed in Japan shortly before this date by Jesuit missionaries, and the question has been raised whether these thirty-three years of typographic activity in Japan were not due to European influence. But an examination of the books themselves leads to the belief that the European influence if any was small.

28. 華 隧, also known as Hua Wên-hui (華 文 輝) or Hua Hui-t'ung (華 會 通).

29. 無 錫, in the province of Kiangsu.

30. The earliest mention of this printing activity of Wusih is in the Shuo-fu (說 郛) collection of reprints, in a passage to which the date of 1496 has been assigned by Kamesō: "Recently in Hsi-shan (錫 山) in the establishment of Hua Hui-t'ung, printing has been done from movable type of bronze, and a large number of works have there been published." (From text as quoted by Kamesō, pp. 125–126).

The *Tz'ŭ-yüan* gives the date of Hua Sui's printing as the *Hung-chih* period (1488–1506).

There was another famous printer at Wusih by the name of An Kuo (安 國), dated by the *Tz'ŭ-yüan* as during the *Chia-ching* period (1522–1567). Liu An (pp. 43–45) and Yeh Tê-hui (8:5–12) quote most of the available sources, especially those from local histories, relating to Hua Sui and An Kuo, and discuss certain books which are still extant and for which the claim is made that they are the work of these printers.

31. "Recently in Pi-ling (毘 陵 i. e., ~~Nanking~~ Chang-chow or the present Wuching) bronze and lead have been used for the making of movable type, the use of which is much more convenient than printing from blocks. But in setting the type a large number of errors are made." Lu Shên (陸 深), *Chin-t'ai-chi-wên* (金 臺 紀 聞), as quoted in Kamesō, p. 126. Lu Shên lived from 1477 to 1544 (Giles, *Biog. Dict.*, No. 1427). Kamesō dates this book as having been written in 1505.

32. A. Forke, *Mê Ti*, Berlin, 1923, introduction, page 8.

33. In Macao. During the following century the Jesuit missionaries did a great deal of printing both in Chinese and in Latin, sometimes by Chinese methods and sometimes by European and sometimes by combinations of the two.

34. The *Szŭ-k'u-ch'üan-shu* (四 庫 全 書).

35. Kamesō, p. 126.

36. Courant, introduction, page 47.

37. The number of Chinese characters in use has to be multiplied by the average number of pronunciations of the same character—which are

represented by different combinations of phonetic symbols alongside the character. This renders the Japanese font even more cumbersome than the Chinese.

CHAPTER XXIV

THE PEDIGREE OF GUTENBERG'S INVENTION

1. There is no need here to go into the merits of the Gutenberg-Coster controversy. The name Gutenberg is here used to denote the inventor of printing, because that is the more generally accepted view. For a clear exposition of the opposite view the reader is referred to the article on typography in the Encyclopedia Britannica (Eleventh edition).
2. A clear popular account of the European background of typography is found in *The Invention of Printing* by T. L. De Vinne (New York, 1876). A more up-to-date account, emphasizing especially bookbinders' metal stamps, copper-plate engraving, and other work in metal is found in *Festschrift zum Fünfhundertjährigen Geburtstage von Johann Gutenberg*, edited by Otto Hartwig (Mainz, 1900), pp. 25–64.
3. The statement of Jovius written in 1550 (see chapter 16, note 9) is the nearest approach to early direct evidence of the transmission of typography from China. It seems unwise to overstress the authority of this quotation, especially in relation to typography. The phrases "*artifices typographos*" and "*more nostro*" may easily be loosely used. Though it is true that metal type, as used in Korea, were introduced into China just before the first Portuguese visits (see chapter 23), it is more probable that Jovius' reference is to block printing.

   A recent writer, Pierre Gusman (*La gravure sur bois et d'épargne sur métal*, Paris, 1916, pp. 37, 38) has proposed two other possible theories to account for the transference of typography from the Far East. One is that it was brought by way of Russia and learned by Gutenberg during his supposed stay in Prague. The second is that it was brought into Europe by a company of Armenians, who had (supposedly) earlier been in contact with the Uigurs, and who were later living in Holland in the time of Coster. Neither theory seems convincing.

   Should the version of the Coster story, according to which Coster

first printed with wooden type sawed from a block, prove true, it would add a certain presumption in favor of connection with the type described by Wang Chêng and found by Pelliot. But recent investigations have tended rather to discredit this part at least of the Coster theory.

Until further and more convincing evidence can be found, the question will have to remain an open one, with the presumption against any connection of European typography with China other than through the indirect channels enumerated later in this chapter—through the invention of paper and through block printing.

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