However, the most important printing of this period consisted of two separate publications of the Confucian classics. In order to standardize the text, these had been engraved on stone at least three times since the end of the 12th century, long before they were ever printed. It was, it seems, the economy and wide distribution made possible by printing, as exemplified by the many religious and secular works available at this time, that inspired the prime minister Feng Tao (1682–1754) and his associate Li Yu (d. 1755) to undertake publication of the Confucian classics. Despite the disturbances of civil wars during this period, Feng Tao was able to remain in high position in the government through ten reigns of five different dynasties, and this enabled him to carry out this task. It began in 1732 when the chief counsellor recommended the recruiting of learned scholars from the National Academy to make a collation of the text based on the version of the Stone Classics of the Thang dynasty, and of good calligraphers to transcribe the correct text on paper in standard style, and this to be cut on wood blocks. Five sheets of text were to be prepared each day. The text included the eleven classics authorised in the Thang, plus two supplementary works on the forms of characters used in the Five and Nine Classics. The task took some twenty-two years; the collection was completed and printed in 130 volumes in 1753. This was the first time that the Confucian classics were printed, and the beginning of official publications for sale by the National Academy.

Two years later, in 1755, a lexicon of classical terms, Ching Tien Shih Wen, was entrusted to Thien Min for printing. Four years later (1759), the Shang Shu Shih Wen, a section of the above, was prepared for printing by Kuo Chung Shu (1718–92). It was twice revised and reprinted, in 1762 and in 1766.

At the time when the printing of the Confucian classics was completed in Khialeng, in 1755, another project for printing them was started in the state of Later Shu (modern Szechuan) under the private sponsorship of its minister Wu Chao-Fang (d. 1767). Wu first entered the Shu administration in 1755 and was promoted to minister in 1744. It was said that in his youth he was poor, and when he wanted to borrow certain books from friends, they showed reluctance to lend them; he thereupon made a vow that if he should become prosperous one day, he would print the work for scholars. It was when he became minister of Shu that he fulfilled his pledge. After the conquest of Shu by the Sung, all the powerful families which had served the Shu state were punished and their property confiscated, except for the Wu family. Emperor Tai-tsou (r. 1740–76) was fond of books and had discovered

Wu's name in his publications. He therefore ordered that all the wood blocks be returned to the Wu's, and Wu Chao-Fang's descendants were supported from the large profits made by printing them; moreover, Wu's son, Wu Shou-Shu, served in high positions both under the Shu ruler and later at the Sung court. Not much information exists about the actual printing of the Confucian classics by Wu Chao-i who is said also to have printed other works. These included the Wen Huaen, Chuh Huaen Chih, and Po Shuh Lien Chih, the last two being collections of literary quotations used by students in preparing for the civil service examination. The story of Wu Chao-i is probably the first used by Confucian scholars to exemplify the rewarding of the virtue of printing books, and similar stories were repeated in many later works concerned with books and printing.

Other works printed during this period include the first book on historiography: Shiht Hsang (1760–72), and the first collection of regulated verses: T'u T'ai Hsin T'ao, compiled by Hsiu Ling (1747–92). None of the printed works mentioned in various sources now survive, except for a few Buddhist scrolls and pictures printed toward the end of the tenth century. Of these the best known are the invocation sutras, Tao-Hau T'ai-Lo-Shi, printed by Chien Shu (i.e. Chihien Hung-Shu, 1749–98), prince of the Wu-Yieh state (modern Chekiang together with parts of Chiangsu and Fukien, with its capital of what is modern Hangchow). At least three versions printed with different dates are known to have survived. One, printed in 1762, and a half inches wide and about twenty inches long, was found in a pagoda in the Thien-ning Temple in Huchou in 1797. Its text consists of some 341 lines of characters, with eight or nine characters to each line, preceded by an illustration of human figures, while a colophon to the text says, "The generalissimo of the empire and prince of the Kingdom of Wu and Yueh, Chien Hung-Shu, has printed the Pao Chih Han tsu in 83,000 rolls, and presented them for sale-keeping in precious pagodas. Recorded in the third year of Hissei-Te, ting shun (1790)."

Another version, dated i Shun (1695), was contained in a red wooden box, 10cm long, within a gilded stupa when discovered in 1971 at Shao-hsing, Chekiang. This copy consists of line of eleven characters each, preceded by a frontispiece and colophon similar to but not identical with those of the other

* The stories about Wu Chao-i seem to have been derived from his disciple Sun Fang-Chi (not to be confused with Sun Fang-Chih of Shihung), who was first quoted by Chih-i Chien (11th century) in his book Chi Hsi, which was quoted repeatedly by Ming and Ching authors, with factual discrepancies; see Li Shih-Hua (13), pp. 193–94, and also Wu Shih (17), pp. 47–48. See also Wu Tai (2), pp. 1–2.


* See Wang Kuo-Wei (13), ibid., pp. 193–94, and also Wu Tai (2), pp. 47–48, with plates of the full text. Only two copies of this version are known. One copy, in the Royal Library of Sweden, was acquired from a private collection in New York. Another copy is reported to have been found under a Sung pagoda in 1971 in Wuwei, Anhui, which was out of the jurisdiction of the Wu-Yueh Kingdom, indicating the circulation beyond its border; see Chiang Hsi-Shih (17), p. 74.
Besides the printed scrolls from eastern China, a number of printed fragments and single sheets from this period have been found in Tunhuang. Many of these are undated, though a few bear exact dates and the names of donors and block cutter, and duplicate copies of some of them seem to have been printed from the same block. Some have been coloured by hand on both sides. Two, printed in + 947, depict Kuanyin or some other divinity on the upper half, with an inscription of praise in about 100 characters on the lower half (Fig. 1116). One print, from + 930, is a fragment in eight sheets of the Diamond Sutra, and this is probably one of the earliest specimens of paged paper books still surviving. An undated rhyme book, Chi-i-shih, also in paged format, is believed also to have been printed during this period.

(3) Incunabula of the Sung and Printing under Four Extraneous Dynasties

From its modest beginnings, printing became a fully developed and advanced art in the Sung dynasty (+ 960 1279). Techniques were improved, new devices introduced, and the scope of printing was widened further still. The methods spread not only to many neighboring nations in the east, west, and south, which had been in contact with Chinese culture for many centuries, but for the first time also to several non-Chinese peoples in the north. From there, printing began to cross the Chinese border and move westwards. The excellent block printing of the Sung period became a model to be emulated by later printers, while the invention of movable type was one of the most important developments in history. This was the golden age of Chinese printing, and books printed at this time equal in importance the incunabula produced in Europe three or four centuries later.

At the beginning of the Sung dynasty, the Buddhists began the gigantic project of printing the Tripitaka, which was followed by the government-sponsored printing of the Confucian classics, the standard histories, and other literatures. The Taoists also began to print their canon, comparable in scope and quantity to the Buddhist collection. Many government offices, schools, monasteries, private families, and bookshops participated in the printing business; in fact publishing proliferated in almost every field of knowledge, extending from the canonical literature to include history, geography, philosophy, poetry and prose, novels and dramas, divination and occultism, and scientific and technical writings, especially on medicine. The centres of printing were in Khai-feng in the north and Hangchow in the south, the two capitals of the Sung, and Mei-shan in Szechuan, where literary tradition can be traced back to the Thang and Five Dynasties, was the

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2. This version is more common; see description by Wang Kuo-lin (6); Chiang Yen (7); Carter (4), pp. 75, 80-1; Giles (5), pp. 51-2, 75; Li Shao-Hung (17), pp. 10-15; within some of the bricks, a picture of a pagoda was accompanied by the characters, see Chiang Hui-Min (14), p. 76.
3. See the Sung edition of Hui-Fa Chi, written with commentary by Yen-Shou and printed in Hangchow in + 1165; Chiang Hui-Min (14), p. 75.
4. Fu Jien (73); Lien Shou (74).
cultural centre of west China. Printing also flourished in Chien-yang, Fukien, one of the major centers of papermaking in south China.

Throughout the three centuries of the Sung, at least six different editions of the Buddhist Tripitaka had been printed,6 and this proved to be the most productive period for the printing of that comprehensive collection of Buddhist literature. The six editions were the Khai-pao7 printed in I-chou (modern Chincheng) in +971–83 (Fig. 117a), the Chihung-ning8 in Fuchow in +1080–1112, the Phi-hu9 also in Fuchow in +1112–72, the Yuian-chiu10 in Hu-chou (in Chekiang) in +1132, the 'fo-fo' in An-chi (in Chekiang) in +1175, and the Chi-cha12 edition in Hsing-chiang (modern Nanchow) in +1237–1327 (Fig. 117b).13 All but one of them consisted of from 7000 to almost 7000 chaps (rolls) bound in the continuously folded form known as sara binding; the exception was the Khai-pao edition which was in roll form.14 Supposing that an average of fifteen blocks were needed for one chap, a

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6 Not counting the two editions produced under the Liu and Chia dynasties during the same period, and four more, including one in the Hsi-hua script, under the Yuan dynasty, as described below.

7 All the volumes of three editions have been lost except for the Chi-shu edition and a few fragments of other editions; for details of the various editions see Yeh Kung-Chiao (c). Kuench Chiao (b).

8 A few volumes of the Khai-pao edition printed in Hsiao-ting (Hunan) have been discovered, but it is not known whether this edition was printed in both Chinchow and Hsiao-ting, or whether part of the blocks were transferred from Suchezu to Hsiao-ting.

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Fig. 1196. Printed prayer sheet on white buff paper, depicting Manjusri riding on a lion with two attendants, c. 1760. British Museum.
total of some 60,000 to 80,000 blocks must have been cut for each set. This involved the training of calligraphers, cutters, and printers, as well as other skilled workers at a variety of different locations, and so contributed to the spread of these arts. Although there is no known record of the number of copies printed of each set, enough must have been prepared not only for deposit in the many monasteries in the empire, but also for distribution to other nations such as Tangut, Korea, Japan, and Vietnam, which sometimes requested more than one copy at one time.

From the late 13th century, thirty years after the founding of the Sung, the printing of Confucian classics and standard histories by the National Academy began. This included the new commentaries on the twelve classics printed in 1290–96 and the re-engraving in 1305 of the standard Feng Tao edition of the twelve classics, while with the addition of the Meng T'ao in 1011, the standard

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* This estimate is based on the Erwan Triplemel of 1271, which printed in 1450 from 81, 768 blocks which are still preserved in the Harry Ransom Center.

* The introduction of the Triplemel and other books from China to other countries will be discussed in the section on the spread of Chinese printing; see below, pp. 313 ff.
Academy. Numerous works in all branches of knowledge were also printed by various local government agencies, private families, and bookshops in almost all parts of the empire, and of these three types of local government agencies were extremely active in printing and publishing. First, various local government offices of different departments printed a great variety of histories, literary collections, and scientific and medical works, including the annalistic general history *Tso Chih Thang Chien* by Su-nan Kuang (± 1019–86), printed by the Chekiang Office of Tea and Salt Revenue in 1125; and a collection of medical prescriptions, the *Thai Phing Sheng Hua Fang*, reprinted by the Fukien Office of Financial Administration in 1147. Second, the local governments of such prefectures and sub-prefectures as Chiang-ning and Phing-chiang in modern Chekiang, Lin-an, Yü-yao, and Yen-chou in modern Chekiang, and Mei-shan in modern Szechuan, also played their part. The most famous of their publications were the Mei-shan edition of the seven standard histories of the Southern and Northern Dynasties printed in +1144 and the Phing-chiang-fu edition of the classical work on architecture, the *Ying Tao Fu Shih* by Li Chieh, printed in 1145. Third, public and private schools, Confucian temples, and ancestral halls of various localities printed various kinds of books, including five medical works by the Huan Chhi Shu Yüan in 1164 and the beginner’s textbook *Thang Meng Hua* by the ancestral hall of the Lu family in Ching-hua in 1215. Such local and provincial agencies as these provided standard texts and any specially needed books as their responsibility.

Some of the most popular books printed and published in the Sung dynasty were associated with private families, of which the most outstanding was the Yu family of Chien-yang, Fukien, which had a tradition of continuous operation in the book business for over 500 years. As early as the +11th century the Yu family was already engaged in printing in Chien-yang, which became a famous centre of the book trade and printing from then on. Books engraved by them were still very popular in the +13th and +16th centuries, and a bookshop owned by one of the family was still operated as the original site in Chien-yang as late as the eighteenth century. The most prominent printer of this family known to us in the Sung dynasty was Yu Jen-chung (fl. +1136–93), who held a chih-chia degree and collected over 10,000 volumes; his studio was therefore called Wan Chuan Lou (Tower of Ten Thousand Rolls). He printed many titles we still know, including the famous Nine Classics and Three Commentaries published at the end of the +12th century. Yet even more works were printed during the Yuan dynasty by one of his descendants, Yu Chih-an (fl. +1300–45), whose printing firm was...

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*See details on titles and printing agencies given in Yeh Te-Hui (2), pp. 60–65.

The book was first published in 1125 and reprinted in 1145. The original edition is no longer extant, except for the fragments of 1145 edition which were found in 1936. A reconstructed edition of the work based on manuscript was published with colour illustrations in 1905.

This unknown tradition of the Yu family’s interest in the book business prompted an inquiry by the Chihien-lung emperor in 1759; see the decree and report quoted in Yeh Te-Hui (2), pp. 60–5.

1) 那有 2) 何俊 3) 曾浩 4) 方道 5) 李炎 6) 留志安
7) 留志安 8) 方道 9) 曾浩 10) 李炎

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Fig. 14.8. The Sung printing of the Chao Pei Sun Cong, Arithmetical Classic of the Gnomon and the Circular Path, written in the 1st century.
called Chin Huy Tang (Hall of Abundance through Diligence). Among his publications were the collection of medicinal prescriptions *Thai Phung Hui Min Ho Chi Chi Fang*, printed in 1794 (Fig. 1.110), collected commentaries on poems of Li Po and Tu Fu (+1311-12), while many classics and histories came out between +1333 and +1345.*

Another noted Fukien printing house was the Shi-Tah Tai Thang (Hall of Colourful Generations) of Liao Ying-chung (+1200-75), a scholar-official from Shao-wei (in Fukien), who published a de luxe edition of the Nine Classics and Three Commentaries around +1270. This edition was noted for its careful collation, refined execution, its excellent ink and paper, and its rich decoration; unfortunately it was soon destroyed by the Mongol invasion of southern China. However, a facsimile of this edition was reprinted in about +1300, together with a manual of collation and printing, the *Chiu Ching San Chuan Tien Ko Lu* (Manual for the Transmission of the Nine Classics and Three Commentaries), which provide specifications for the selection of editions, the style of calligraphy, its cursive, pronunciation, punctuation, and collation.* This work has been praised as a classic model of textual criticism and printing ever since.

Competing with the many private printers of Fukien were those of the two Sung capitals, K'ai-feng and Lin-an (modern Hangchow), where numerous bookshops flourished. The area around the Hsiang Kuo Ssu monastery in K'ai-feng was the centre of a book market, and the famous painting of the Spring Festival on the Pien River in K'ai-feng, *Ch'ing Ming Sheng Ho Tha,* depicts one bookshop (Fig. 1.110) together with many other shops along the river front. The prosperity of the book industry in Hangchow is testified by a cluster of bookshops in the city; at least a dozen bookshops with precise addresses can be identified from the colophons of the printed editions. One of them had two or three branches, while many bookshops specialized in publications on particular subjects.*

The most noted family printers in the Southern Sung capital was Ch'en Chi* (b. +1167-1225), a poet and publisher, and his son, Ch'en Chih-Yuan (b. +1225-64), who stood first in the provincial examination. Together with other members of the family, they operated bookshops known as *shu pheng,* and printed no fewer than a hundred works, especially anthologies of poetry by almost all the

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* For orde printed by the Yei family, see Yei Te-Hui (2), pp. 45-7.
* The provenance of this edition and authorship of the manual have traditionally been attributed to Yuen Khoi (+1181-1247), of Hsiang-tai (modern Tchang-chi, Honan), a grandson of the song general Yuen Foi (+1195-1247), but are now attributed to Yuen Chien, a distant descendant of Yuen Foi of Hsin, Chang-hung; see Weng Sung-Wen (3), pp. 45-7; ibid. (5), pp. 199-202; Achilles Fang (3), pp. 65 ff. Also notes in Hournn (2), p. 539.
* See Fung Chao-Ming Hua Lu (CSP), ch. 3, p. 19.
* See names and addresses of bookshops and their distribution in Hangchow in tables and maps in M. Finggan (1), pp. 294 ff.
* 許之章
* 太平惠民和劑局
* 柳憲卿
* 九龍堂
* 陳師行
* 陳師文
* 劉國
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* 陳師文
* 劉國
noted poets of the Tang and Sung dynasties. Other family printers were the Yin of Lin-an, the Huang of Chien-an, the Liu of Ma-hua town in Chien-an, the Juon of Min-shan (Fukien), as well as many others in Szechuan, Shansi, and the Chiang-Huai and Hu-Kuang regions (modern Chiangsu, Anhui, Chiangsi, and Hunan). Their publications cover a great variety of subjects, including classics, histories, poetry, individual literary collections, and medicine.

Contemporary with Sung China, four nomadic tribes—the Khitan, Tangut, Jurchen, and Mongol—established kingdoms along its northern border and gradually expanded into Chinese territory. Being unlettered and less civilized, they adopted Chinese culture and made use of printing as soon as they conquered and came to rule the Chinese. Early in the 10th century the Khitan kingdom or Liao dynasty (+907-1125) created a form of writing of some 3000 characters, based on the Chinese system, in which to express its own language, and many Chinese classics, histories, and medical works were translated into Khitan and printed, though their circulation was prohibited outside Khitan territory. None of this Liao printing survives, though there is a Sung reproduction of a Liao printed glossary in Chinese, the *Lang Khan Shuo Chin*, with prefaces dated +907 and +1034. The most extensive Liao publication known to us is the Chihitan edition of the *Tripitaka* in Chinese, in some 6000 chuan in 529 cases, printed with Korean paper and ink in Peking in 1031-64; but nothing of it survives today.b

The Tangut or Hsi-hsia kingdom (+990-1227) in northwest Manchuria and Mongolia proclaimed itself an empire in 1031, with its capital in what is now Ning-hsia. A system of writing its language, based on Chinese and Khitan, was created in 1036, and many Chinese books were translated and then printed in this script. Gifts and exchanges of books were arranged with the Sung court from time to time; Buddhist *sutra* were donated no fewer than six times and some of them were translated and printed. After the Mongol conquest of Tangut and China, a Tangut edition of the *Tripitaka* in the Hsi-hsia script, in more than 3600 chuan, was printed in Hangchow and completed in 1302, and about a hundred copies were distributed to monasteries in the former Tangut region. Many fragments of books in Tangut and Chinese were discovered at the beginning of this century, including two editions of the *Diamond Sutra* printed in 1016 and 1189, and two bilingual glossaries, the *Hsi-Hsia Tsu Shu Yin Thang* (+1152), and the *Fan Han Ho Shih Ching Chou Chu* (+1194). Apparently many books in their native tongue were also printed under the Tangut rulers.c

The Jurchen or Chin dynasty (+1114-1234) originated in Manchuria and

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*a* For private printing in the Sung, see Yeh Te-Hsi (5), pp. 44-49.

*b* See Chang Hin-Min (5), pp. 141-44; and Kenneth Chibnall (6), p. 319.

*c* Printed materials in Tangut were discovered in the mint town of Khan-ku00 by Koelov in +1906 and by Stem in +1913, and also in Tsolimgung, Turkei, and Ning-hsia; see K. T. Wu (2), pp. 322-37. Moveable type printing off +1150-64 were recently found and reported by Wang Ching-pi (4) and Cheng San-Wen (5); also a collection of Tangut Tripitaka fragments in nine parts was published in Delhi in 1917; see Goodrich (3), pp. 64-65.
occupied the northern part of China after the defeat of the Chihitian in 1125 and the Sung in 1127, when the capital, Khai-feng, was captured. Immediately, all the books and printing blocks in the National Academy were moved to the north, and a government printing office was established in Phing-yang (in modern Shansi) four years later, while an Institute for the Promotion of Literature (Hung Wen Yuan) was established in 1135. Many books of classics, history, philosophy, poetry, and science were then printed by various government and private agencies. These included the famous Ta-huan edition of the herbal Chang Shi Ch'ung Lei Pen Tshao, printed in Phing-yang in 1240 (Fig. 1121). Another edition of the Tripiataka, 7182 chian in 682 cases, was printed on paper-mulberry paper in Ch'ieh-chao, Shanhsi (+1160-73), and competing with it was a most comprehensive collection of Taoist literature, entitled Hsiian Tsu Pao Tsang, in 6455 chian in 69 cases, which was translated into Jurchen, for which a script was created between +1123 and +1135, following the Chinese and Khotan model.

* Others forty works in Chinese and fifteen in Jurchen are known to have been printed by the National Academy of the Chin dynasty, and eleven by private and commercial printers; see Yeh Te-Hai (2), pp. 89-90.

* An incomplete set of this edition was discovered in 1933, in Chao-ch'eng, Shanhsi, a total of 4,395 is kept in the Peking Library.
* 本院* 文文院* 統史圖類本草* 玄要寶藏

The Mongols annexed the Jurchen kingdom in north China in 1235, and conquered the Southern Sung in 1279, thus uniting the empire under their Yuan dynasty (+1271-1368). Inheriting the legacy of Sung printing, the Yuan not only continued its tradition of fine workmanship, especially at the beginning of their rule, but also introduced some innovations. In addition to the National Academy, several other government agencies were established to edit and print books. These included the Institute of Compilation (Pien Han Shu) in Peking, the Institute of Literature (Ch'ing Chi So) in Phing-yang, Shanhsi, the Office for the Promotion of Literature (Hsing Wen Shu), and the Bureau of Publications (P'i Shu Chien), which last was reported in +1273 to have a staff of 106 members, including forty woodcutters, thirty-nine workmen, and sixteen printers. A particularly interesting aspect of Yuan publication was the practice of joint enterprises in printing by local schools. Typical examples were the projects to print the seventeen standard histories jointly by nine circuit schools of the Chien-khang Region in +1405 (nine were actually completed), and the collection of eleven classics by schools of the Ch'ang-hsi Region at an earlier date. A local history of Nanking, Chin-Liang Hsin Chi, in fifteen chian and thirteen volumes, was co-operatively printed from 1217 blocks contributed by several local schools and government agencies. Funds were raised in the same way for the cutting of some 3000 blocks to print the encyclopaedia Ta Hua and thirteen other works by Wang Ying-Lin (+1293-?).

Remarks on the joint printing ventures appear in many books printed by similar co-operative efforts, some of which still survive.

The Mongols continued to print several more editions of the Tripiataka, including the Hwang-fa edition, 7182 chian, printed in Peking in +1277-94, and the Pho-ning edition, 6010 chian, in Hangchow in +1278-94. The Chi-sha edition, 6972 chian, was begun in Phing-chiang (Soochow) in +1293 under the Sung but not completed until +1322 at the time of the Yuan dynasty. The Khotan edition in Hsi-hsia script mentioned earlier was completed in +1392, the Chin edition of the Taoist collection, the Hsiian Tsu Po-Tsang, was reprinted in some 7000 chian in +1277-84, but it was destroyed under the Mangu emperor in +1288, when Taosim was persecuted. Despite the imperial order, however, some of the blocks were saved by being hidden, and no fewer than six or seven sets of the blocks for printing this Taosim collection were still preserved in Taosim monasteries in north China around +1281. Because so many skilled cutters and printers had been trained in Chekiang and...
Fukien under the Sung, the printing centres in these two regions continued to prosper under the Yuan and no fewer than 220 titles are known to have been printed by 107 family firms, mostly in the fields of classics, history, individual literary collections, dictionaries, encyclopaedias, and medicine (Fig. 1122). Among the medical works, at least five editions of the herbal and more than twenty collections of prescriptions are known to have been printed by such families as the Kao, Liang, Liu, Su, Te-hao, Tsan, and Hsu of Phing-yang (in Shansi), Chien-an (in Fukien), and other places. Though they did not call themselves book dealers, the private printing of such technical works was, it seems, for profit.

Phing-yang in the north and Chien-an in the south were the two most flourishing commercial printing centres under the Yuan. In Chien-an alone there were forty-eight commercial firms which are known to have published during this period, the most active being the Jih Hsin Thang of Liu Chin-Wei and the Chih Yu Thang of Yu Chih-an. Each of them printed nearly two score works, the Jih Hsin Thang publishing an average of one work each year from 1335 to 1377, and the Chih Yu Thang one every two years in 1394-95. Both the Chih Yu Thang and the Chihang Wen Shu Yuan of Cheng Tsien-Tseh flourished for many generations; the former operating from the 11th century and the latter from the 14th, and both continued active until the 18th century. While most publishers printed a variety of books, a few concentrated on certain subjects only. For instance, the Yuen Shu Shu Yuan in Chien-yang published at least five large sets of encyclopaedias in 1315-25, and the Ku Lin Shu Thang in Lu-ting (in modern Chiangsi), the Hsio Chi Thang of Yen-shan (in modern Hopei), and the Kuang Chihin Thang of Chien-an, all specialised in printing medical books. Also important in this period was the publication of popular stories and dramatic texts which flourished during the Yuan dynasty, though few of them exist now.

(4) New Dimensions of Ming Printing

Ming printing was distinguished by the extended scope of its subject-matter and by its technical innovations and artistic refinement. In contrast to that of previous periods, the printing under the Ming included not only the traditional works in classics, history, religion, and literary collections, but also such new subject-fields as popular novels, music, industrial arts, accounts of ocean voyages, shipbuilding, and scientific treatises from the West, which had never before been seen in print in China. Significant increases were also noted in printing of dramatic texts, medical
which inherited the books of the former imperial collections of the Sung, Chin, and Yuan dynasties, consisted in 1,441 of 7,350 titles in some 35,000 volumes (bhs) containing one million characters. Thirty per cent of the materials were in print and seventy per cent in manuscript.

The period after 1,500 turned out to be the most productive era for the development of literature, art, and technology in China. The popular novels written in the colloquial language at this time set the standard style of Chinese traditional fiction for the following centuries, while after 1,600, the development of fiction and dramatic texts, in turn, encouraged the refinement of woodcut book illustrations in popular literature. At the same time, illustrated works on the industrial arts, on the design of inksakes, and manuals of painting and stationery were also produced at a high standard of excellence. Multi-colour processes with wood blocks were developed from two to more than five colours in the printing of texts with commentaries, maps, letter papers, and other artistic works.

The arrival of Jesuit missionaries in China at the end of the sixteenth century marked the beginning of the introduction of Western knowledge to Chinese intellectual circles. As a result, during the next two centuries, more than four hundred writings and translations added to Chinese scholarship in such new fields of knowledge as Christianity, Western humanities and institutions, and scientific literature. Among the earliest printed works from the West were Michele Ruggieri’s catechism of Christianity, Sheng Chiao Shih Lu, printed in Canton in 1,582; Matteo Ricci’s map of the world, K’hu Ta Wu Kuo Chhiu Ts’ao (1,584) and his translation, in collaboration with Hui Kuan-Jung-Chiü, of Clavinas’ Euclidis Elementorum, Chi Ho Yüan Pen (1,607). Many other works on mathematics, astronomy, physics, geology, biology, psychology, medicine, and world geography and history, besides those on the Christian religion, were included in the late Ming and early Ch’ing printing.

Many official agencies in both the central and local governments engaged in printing various kinds of books for different readers. The printing facilities at the imperial palace, known in general as Nei Fu, were in charge of the Supervisorate of Ceremonies (Su Li Chien), which was one of the twelve supervisory offices established early in the Ming. Three printing shops (Ching Chihang), including those for the Confucian classics, Buddhist sutras, and Taoist canons, were operated under this agency. The shop for the Confucian classics printed many prestigious editions of the Five Classics and Four Books, and a collection of neo-Confucian philosophy called Hsing Li Ta Chhiu Shih, printed in 1,415. Although the physical
format of these editions was excellent, their scholarly value was not considered high because the printing agency in the imperial palace was in charge of eunuchs who were not competent in scholarly matters. Imperial instructions and official documents and compilations were also printed by the imperial printing shop. For example, the official geography of the Ming empire, Ta Ming I Thang Chih, ninety chia in, came out in 1511 (Fig. 112.3), the collected statutes of the Ming dynasty, Ta Ming Hui Tien, in sixteen chia, in 1511, and its revised edition, twen chia, in 1527. The official gazette, Ti pao, the predecessor of the Peking Gazette, was first transcribed by hand but, beginning in 1628, was printed with wooden movable type. It is said that

more types were cut for the frequently used characters than for those that were less used.

Various branches of the government such as the Board of Rites, Board of War, Board of Works, Censorate, Imperial Observatory, National Academy, and Bureau of Physicians are all known to have printed books. For instance, the Board of Rites printed a collection of documents concerning the bestowing of posthumous imperial honours, Ta Li Chi, in four chian, compiled under imperial auspices and printed in early 1536. The Board of War printed an illustrated work with maps on the defence organisation of the northern border regions, titled Chu Pei Ho Shu8, presented to the throne in 1538. The Bureau of Physicians published several works on medicine, including an illustrated book on acupuncture and moxibustion, Thang Jen Chen Chiu Tu Ching9, in three chiao, printed from a Sung text on stone, with illustrations from a bronze model, under imperial auspices, in 1443. But though most of the publications of government agencies related to their respective fields of administration, a fair number of them did not. For example, many works for enjoyment and amusement were printed by the Ming Censorate, the Tu Chha Yüan, and among some thirty of their titles there were two popular novels, the San Kao Ch'ü Yen-P9 (Romance of Three Kingdoms) and the Shui Hu Ch'uan (Water Margin), three works on the game of chess, and two on music and songs.10

The most productive among the government agencies was the National Academy, Kuo Tzu Chien7 which, between its southern and northern branches, printed no fewer than three hundred works including classics, histories, local gazetteers, imperial documents, manuals of calligraphy, classified encyclopedias, as well as works on medicine, agriculture, and technology. The most notable of these were the Thirteen Classics and the Twenty-one Standard Histories, which were first printed from old blocks accumulated from previous dynasties during the previous seven centuries, and later from new blocks carved between 1530 and 1566. The teachers and students of the academy were responsible for the collation, revision, printing, and custody of blocks, and their names often appear on the blocks themselves.11

The distinguished contributions of Ming printing include the publications of various local officials such as governors, provincial judges, princes, and certain lower administrative units. Many of the books were printed by the offices of prefectures of almost all the provinces in the empire, including such border and interior regions as KiangSu, Kiangsi, Yunnan, and Kweichow, where printing was scarcely known in previous dynasties, and especially significant was the compilation and publication of local gazetteers, which began to proliferate to cover all

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* See Thang-Li Wei Chi (SPEF), ch. 5, p. 216.
* See the list in Kuo Ch'ü Shu Chi (KET).
* Cf. an account of the printing of the National Academy at Nanking by Liu I-Chen (p.).
provinces and numerous prefectures, sub-prefectures, and even towns and villages throughout the Ming empire.\footnote{See titles listed in Zu Chao Shu Ji; some 700 titles of Ming local gazetteers are recorded in the first edition of Chu Shih-Chia (14), as compared with twenty-eight for the Sung and eleven for the Yuan periods.}

Among the many local official printers, most interesting were the various enfeoffed princes, who had the wealth, leisure, and the opportunity for book collecting and printing. Their libraries contained many rarities of Sung and Yuan editions bestowed upon them by the emperors, while quite a few were prominent authors, collectors, and printers of fine editions, and they constituted one of the distinguished features of Ming scholarship; more than thirty of them are known to have engaged in writing and printing. Not only were many of their own works printed, but also the writings of local scholars which were sometimes sponsored by these princely establishments, and more than 250 titles of these princely editions are known to have been printed; one Prince of Ning printed as many as 157 titles.\footnote{See also Chao Hsi Pu Ti (7); Chao Hsi Pu (7); Chao Hsi Pu Ti (7).} Their publications included works on medicine, longevity, meditation, amusement, music, games, instruction and conduct of princes, and textbooks for women, besides traditional subjects. The most notable among these publications included the collected works on music and acoustics, Yu Ch'ii Chia Chuan Shu\footnote{Chin Hsia Wua Hua Ku (14), printed by the Prince of Chou, Chou Yu-Tun, in 1501 and again in 1503; a classified encyclopedia of quotations, Chiu Hua Wua Hua Ku (14), printed by the Prince of Hui in 1533: a treatise on incense and perfumes, Hsin Hsi Pu (9), and on tea, Chia Pu (9), both printed by the Prince of Tung in 1640; and a cookbook, Tsin Shan Ch'ing Yao (9), reprinted by the Prince of Ch'i for the benefit of his peasants. All the books they produced are known to have been well collated, based on the best editions, and printed with excellent workmanship on good paper; while wooden movable type is also known to have been employed by the princes of Shu and I in the sixteenth century.\footnote{See also Chao Hsi Pu Ti (7); Chao Hsi Pu Ti (7).} Under the Ming, private printing was not common before 1500, but became very popular during the sixteenth and seventeenth centuries. Many of the private printers, including scholars, families, book collectors, local schools, and monasteries, were motivated by altruism toward the spread of literature, and did not act for profit or because of official obligations. Thus the privately printed editions were usually carefully collated and high in quality and workmanship. Works by individual authors were normally published after their deaths and sponsored by their descendants, friends, or families, though in some cases works were printed during their lifetimes, a witness to their own sponsorship. The famous work on technology,
variety of subjects, especially many multi-volume works of classics, histories, literary collections, and tshang shu. One record shows that he used 11,816 wood blocks for the Thirteen Classics, 22,204 blocks for the Seventeen Standard Histories (Fig. 1126), and 16,637 blocks for the collection Ching T'ai Pi Shu4, which consists of 140 titles.4 At one time, during its early stage, Mao employed some twenty cutters and printers in his workshop and accumulated as many as 100,000 blocks for the printing of various works in his studio Chi Kuo5, a name for both his private library and his printing shop.6 His work had a great impact on printing in the early Ch'ing period.

Many private schools printed textbooks for their students and other titles of scholarly importance. The Ch'ung Ch'eng Shu Yuan9 of Kuangtung printed the collected commentaries of the Four Books in 1535 and part of the Standard Histories in 1537, while the famous Tung-lin shu-yuan1 and other private academies printed many individual literary collections. Certain officials also printed books in their private capacity. Local scholars serving in the capital usually printed a special kind of gift book, the shu ping p'ao, to be presented as a souvenir to their colleagues on their return to the capital from their native provinces. Because the contents of such editions were not carefully collated, they were usually not considered of scholarly value.

As for religious works, at least three and perhaps four editions of the Buddhist Tripitaka and one edition of the Taoist canons were printed under the Ming. The most famous of these is the southern edition of the Tripitaka, Nan T'ang,6 including 1610 works in 681 ch'ian, printed in Nanking in 1572, and the northern edition, Pei T'ang7, including 1615 works in 681 ch'ian, produced in Peking in 1591. Both were printed under imperial auspices and bound in the folded format. A third edition of the Tripitaka, known as the Chiang-shan T'ang,8 was printed in Wu-tha9 and Chingshan as well as several other places in Chiangsu and Chekiang between 1586 and 1637; it was the first Tripitaka to be bound with thread stitching in the flat style. Another edition is said to have been printed in Hangchow in the Chia-ch'ing period (+1572-66), but it may not have been completed, and no such work is now known to exist.10 As for the Taoist canon, the Tao T'ang10, the original set included 5905 ch'ian, compiled under imperial auspices, was completed in 1445 and a sequel in 180 ch'ian, in 1657. The two series were later printed together and distributed to Taoist temples as an imperial favour.11

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1 Numbers of folios of these volumes are given in Wang Ming-Sheng (+1572-97), J Shu Pien (1843), ch. 14, p. (48); these figures equal the number of blocks.
2 Quoted in Yang Shao-Ho's annotated catalogue; see K. T. Wu (1944), p. 245.
3 Cf. Tao Kuang-Fung (+?).
4 Cf. Lai Ta-lun-Jen (+), p. 104; Wagier (6) lists 1545 editions, based on a Chinese catalogue compiled by Pai Yen-Ch'iu of the 17th century. The complete set, now kept in the White Cloud Temple at Peking, was reprinted by the Commercial Press in Shanghai in 1925.
Ming commercial printers inherited the tradition of the previous dynasties of the Sung and Yuan with publishing centres in Fukien, Chekiang, and Szechuan. Such bookshops as Chhin Yu Thang⁴, which had operated in Chien-yang since the Sung, and the Tu Shen Chai², had a history of over a hundred years. The latter, owned by Liu Hung², printed numerous titles of histories, literary collections, encyclopaedias, and medical works. Especially notable were such large multi-volume sets as the Wen Hsin Thang Chiao³, an encyclopedia of institutions in 348 chüans; the Shun Thang Chien Shu Hsiao So⁴, an encyclopedia of quotations in 212 chüans; and the Ts’ao Ming I Thang Ch’ü⁵, a national geography of the Ming dynasty, in ninety chüans. As might be expected, certain printers specialised in medical books. The Chung Te Thang⁶ of Hung Chung-Li⁶ of Ao-feng printed at least eight medical classics, including a collection of pediatric prescriptions, Hsin Erh Fang Chiao⁷, in ten chüans (1440?); prescriptions for smallpox, Ching Chung Chien Shih Hsiao Erh To Chen Fang Lan⁸, in two chüans (1448); a complete work on surgery, Wai Kao Pei Tao⁹, in three chüans (1568); and a supplement to the gynaecological treatise, Hsin Pin Fu Jen Liang Fang Pu I Ts’o Ch’ia⁴⁰, in twenty-four chüans, also printed in 1568.⁶

After 1500 Huchow in Chekiang and She-suien in Anhui were among the best printing centres, and from the late 16th and early 17th centuries, many skillful cutters moved to the area south of the Yangtze, where such cities as Nanking, Soochow, Chiangshu, and Wuhsi became very prosperous in printing and book production. Generally speaking, Ming printing, especially during the later part of the period, significantly influenced the format of Chinese books in the next four or five hundred years. Ming books printed before 1500 inherited the traditional format of the Yuan (Fig. 112); their calligraphy was in the soft style, with a black folding line in the block, and the volumes were bound in a wrapped back binding. After 1500, the Sung traditional format was generally followed, where the calligraphy was more rigid and straight, lacking free and swift movement (Fig. 1124). The folding line was white or blank, and names of calligraphers and cutters and numbers of characters appeared on the blocks, similar to Sung practice. From the middle of the 16th century, calligraphy became more stereotyped in style (Fig. 1125), and this has remained the standard form of Chinese printing to the present day. Unbleached white paper around 1500, and yellow paper again toward the end of the 16th century, at which time binding also underwent a transformation, from the wrapped back style to the stitched binding which remains in use.⁸

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⁴ See text in Yeh To-Hui 77, pp. 137-40.
⁵ See further discussion of book formats and bindings on pp. 222 ff. below.
⁶ See Pei ferry.
⁷ See further discussion of book formats and bindings on pp. 222 ff. below.
⁸ See further discussion of book formats and bindings on pp. 222 ff. below.
Prosperity and Decline of Traditional Printing in the Ch'ing Period

China under the Ch'ing dynasty (1644–1912) inherited a great cultural tradition and, although under the alien Manchu rule, in general enjoyed a period of intellectual development and prosperity. Activities in literature, classical research, and the compilation, collection, and production of books and documents were especially remarkable and abundant. During the first half of the dynasty, from the latter part of the 17th and through most of the 18th century, government leadership in academic pursuits resulted in widespread printing. Numerous distinguished scholars and officials were recruited by the imperial court to engage in the compilation of books, and publication of the results of their research followed naturally. Economic development also gave rise to a group of book collectors who had the financial resources to reprint the rare editions and manuscripts which came into their possession.

The gradual decline of the empire during the latter part of the dynasty, that is, from the beginning of the 19th century, was accompanied by a general recession of activities everywhere and a lack of resistance to Western influence. Although the printing industry continued, it generally degenerated in quality if not in quantity in both official and private sectors, and it was during this period that traditional printing proved insufficient to meet modern needs and gradually gave way to the new technology of the West.

Since the imperial palace was active in printing and compilation, Peking naturally acquired central importance in publishing. Printing and publishing also flourished in places like Nanking, Soochow, Hangchow, and Yangchow. While these centres emerged, Fukuin was no longer as influential and its editions were less widely circulated than before. Publishing in battle-stricken Szechuan was also declining. Throughout the Ch'ing dynasty, Chekiang and Kiangsu remained centres of book-collecting and publishing because of their favourable geographic locations, natural resources, and commercial prosperity. As time went on, Hunan and Hupen came on the scene, while Shanghai, the chief entrance for Western influence, became the main publishing city at the turn of the 19th century.4

Not unlike previous dynasties, the Ch'ing saw active imperial patronage of compilation and publication, but with even greater vigour. The Manchu rulers actually started printing before establishing control over China proper, though their early imprints consisted mainly of Manchu translations of Chinese works. After their ascent to the throne, the publishing policy common to all previous dynasties was continued, the body chiefly responsible for central government printing being the Imperial Printing Office at the Wu Ying Palace (Wu Ying Tien

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4. See Yeh Te-Hsi (2), pp. 255–4; we also discuss distribution of bookshops which produced popular fiction during the Ming-Ch'ing period in Liu T'ieh-lin (4), pp. 36–46.
reprint, and before long several local editions were printed with wood blocks at Nanking, Chekiang, Chiangsu, and Fukien. After the Th’ai-Phing uprising, local government printing was especially prosperous, and provincial printing bureaus were established to restore books lost in the turmoil. Numerous printing works were set up in Nanking, Yangchow, Suochow, Hangchow, Wuchang, Chihchou, Nanchang, Chihengu, Tsingtao, Th’aiyuan, Foochow, Canton, Kunming, and other cities; all were renowned for careful execution and mutual cooperation.  

Under the Manchu rule, many private persons engaged in scholarly activities for a variety of reasons. Some, loyal to the Ming court, became recluse seekers seeking refuge in books, scholar-officials who retired from office found in books their ultimate companions, while certain other scholars under threat of persecution diverted their energy to the politically safe pursuit of the critical study of the ancient Classics and history. Whatever the motivation—vanity, a wish to preserve literature, or to propagate scholarship—their scholastic achievements contributed greatly to the printing of new books and, even more frequently, to the reprinting of old ones. Again, there were schools and academies which went beyond the printing of texts for instruction to the production of more general publications, but the audiences at which they aimed differed, as did the contents and qualities of their publications.

Individual scholars who served in government offices sometimes also sponsored printing, using either government or private funds, and their eminent positions enable them to secure assistance of outstanding scholars for works of excellent quality. Another group, mostly learned men and writers, printed books primarily to disseminate the results of their study. But books that survived the passage of time were often loaded with alterations and omissions, and textual errors were particularly common in late Ming imprints. However, a group of Chching researchers who were interested in securing the best texts of standard works, applied their entire lives to textual criticism, and printing the collated texts became their favourite vocation. There were also bibliophiles, or bibliomaniacs, who strove to build up sizable private libraries, sometimes even idolised the rare editions they possessed, though when they printed their choicest items it was probably to broaden their circulation and preserve them from loss or destruction.

A final group consisted of booksellers or trade printers; they dealt in books for profit. On account of their experience of the trade and knowledge of the public demand, their publications reflect more truly the general reading interest of the time. One list records 2,461 titles put out by sixty-two bookshops in Peking’s Liu-li-chiang district, one of which produced as many as forty-nine works. Some of them specialised in what they published; for example, the San Huai Thang and Hung Yüan Thang (Fig. 1109) in Chinese-Manchu bilingual works; the Chén Chén Thang in movable-type publications, and the Tsu Ku Chai in art and archeological works. At least one bookshop, the Sui Ya Chai, edited and printed its...
own collections. The Lin Li Chihang district, where over 300 bookshops were in business at one time or another, was the centre of Peking's book trade from the late Khang-Hsi period (+ 1662–1722) and has been an important site for many intellectual activities until today.

The combined efforts of the Ching printers resulted in such a surge of printing in several major categories that the products of no previous period can be compared with it for quantity or the magnitude of the works produced. First, local histories (a faung chih) were compiled under the auspices of individual local administrations of provinces, prefectures, sub-prefectures, counties, villages, and sometimes mountains, passes, rivers, dykes, bridges, salt wells, temples, academies, tombs, gardens or guilds. Of over 7000 such works known to exist, no less than eighty per cent were compiled and published in the Ching dynasty. Clan registers (tung faua or chih faua) form another category of materials printed mainly during this period, and of them, at least 4000 titles are known to exist in public collections throughout the world. Of them, the source of 1550 is known, and of this number 1214 were compiled under the Ching (see Fig. 11). Individual literary collections (pin chih) are still another category of literature that was largely printed in Ching times; indeed, it is estimated that 14,000 literary writers of the Ching period, many of whom had individual collections, are recorded in five anthologies of the Ching authors. Finally, collections (tsang shu) probably compose the most extensive class of works ever printed. A tsang shu consists of a variety of literary works published or reprinted under one general title and uniformly bound, following a prescribed plan, in order to facilitate preservation, wider circulation, and collecting. Of some 3000 such collections containing 70,000 individual works, the great majority were either produced or reprinted in the Ching dynasty. In fact, of the quarter of a million titles of Chinese publications known to have accumulated throughout the dynasties, no less than half were produced during this period, the greatest amount in all history.

Because of the prevalence of block printing, problems in printed communication arose when China met the West. Before the 19th century, Chinese characters included in Western publications were often printed separately as an appendix, though a few works such as those produced by the Jesuits in the 16th and 17th

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* For a history and description of the Lin Li Chihang district in Peking, see Sung Tien-Chih (2), Wang Yeh-Chih (2).
* Of 350 titles listed in Chu Shih-Chia (3), 355 ed., 455 were printed in the Ching; the 1932 ed. added 361 titles, but no breakdown is given.
* Only fourteen are known to have been produced in Yuen and Ming, and 312 in the Republican period; see Tung I-min (1), p. 96.
* For sources of the estimate, see Yang Chia-Lo (2), pp. 15–16.
* The most complete catalogue of the collections, Chao Kuo-Tsung Shu Tang Lu, vol. 1, registers 3797 works by subject classification; certain classes are arranged by periods.
* It is estimated that 150,000 titles are registered in various dynastic and other bibliographies from Han to the 1930s; 116,492 were produced under the Ching; see Yang Chia-Lo (2), p. 47.
centuries were printed from blocks. As early as 1555 or 1556, European printers began to make experiments to accommodate Chinese characters printed on their presses, while later, in the 19th century, Protestant missionaries tried to cut punches for making metal type for Chinese characters. Robert Morrison of the London Missionary Society established a printing house in Macao in 1814 to print his Chinese-English dictionary (Fig. 1131) and a translation of the New Testament with metal type cut by a Chinese engraver, Tshai Kao, and his assistants. In the following year, the first monthly periodical in Chinese, Chu Shih Su Mei Yi Tacht Shih Chi Chan, was started. This enterprise soon found many followers.

By the middle of the 19th century, fonts of Chinese type were made in Europe and America for missionary and other printers in the Far East. At first, these types were used primarily for printing bilingual texts, though gradually they found their place in purely Chinese printing. A Mr Tong created two fonts containing over 150,000 types cast in moulds at Canton in 1850, and nine years later, the electrotypes process was introduced by William Gamble to make a large set of Chinese type in Shanghai. But in Chinese circles block printing and wooden type were still more popular, and modern methods were not generally accepted by Chinese printers until early in the 20th century.

In contrast to typography, lithography catered better to the needs of Chinese books and successfully affected literary and artistic life in China. Printers in the past had usually reproduced fine editions in facsimile by the laborious and difficult process of re-engraving, so they naturally found great advantage in this new process which permitted them to reproduce handwriting and art work directly, or to make exact replicas of treasured editions with great speed. Books to prepare readers for the civil service examination were also conveniently printed in reduced format by photolithography in the late 19th century. Reproduction of pictures and book illustrations was especially successful with this new method (Fig. 1132).

Photolithography was first introduced by the Catholic Thu-sa-wai Press in Shanghai to print Christian literature. The Tien Shih Chi" (Fig. 1133), also established in Shanghai in 1874, produced editions with such small characters that a magnifying glass was sometimes provided along with a purchase, while the Thong Wei Shou Chu, founded in 1881, published more facsimiles of old imprints. Besides monochrome pictures, multi-colour photolithography was employed by Fu...
Techniques and Procedures of Chinese Printing

Unlike papermaking, the technical procedures of printing have scarcely been documented in Chinese literature. No information on how printing blocks were made nor on how many copies were printed from each block in earlier times is available, except for occasional remarks made by a few foreign observers and writers. On the other hand, some of the movable type methods were recorded. Details of materials, tools, and the methods used for preparing block printing can only be deduced from an interpretation of related terms, by examination of printed editions, and from the oral testimony of a few surviving craftsmen or observers of the work of carving and printing since its gradual disappearance in the early part of the 20th century. Only recently an article describing the methods of block printing gave some details of the technical procedures, yet even so, many questions still cannot be fully answered.

While traditional terms for printing such as t'ai li (to spoil pear wood), ch'iao tsa (to incise jujube wood), or shu tsu (to send for engraving on catalpa wood) refer to the kinds of materials used, such modern terms as pin shou (to print and brush) or hsiu tsu (movable characters) are concerned with the methods used, and some of

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Footnotes:
2. For its history and development, see Florence Chien (1).
3. See an article written in 1934 by Lu Chih (1), based on the information supplied to him by a surviving block printer.
4. See an article written in 1934 by Lu Chih (1), based on the information supplied to him by a surviving block printer.