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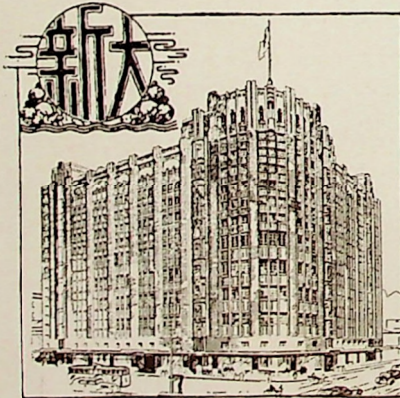
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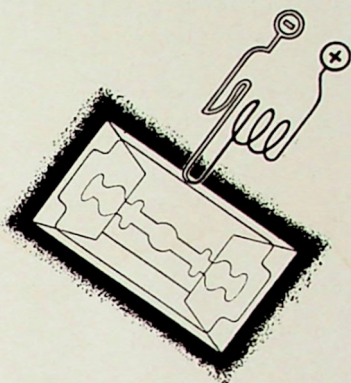
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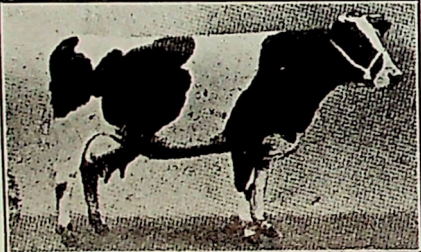
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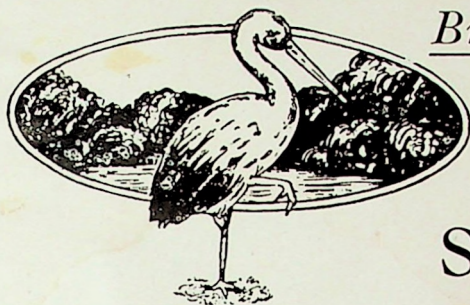
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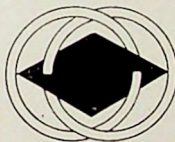
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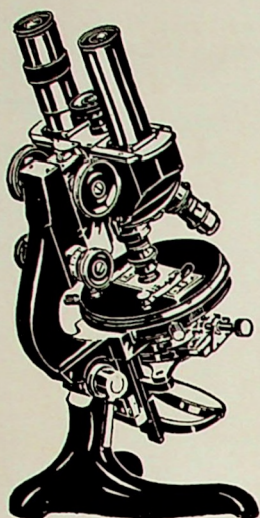
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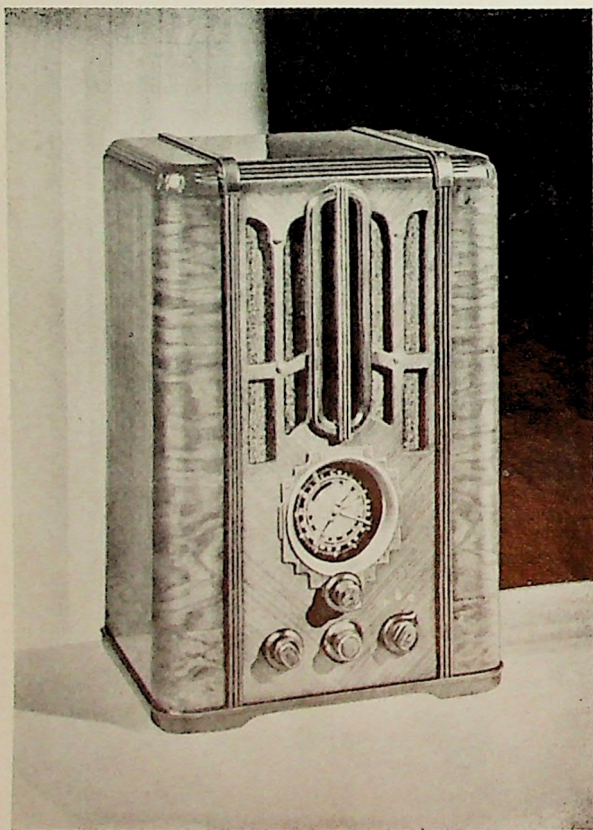
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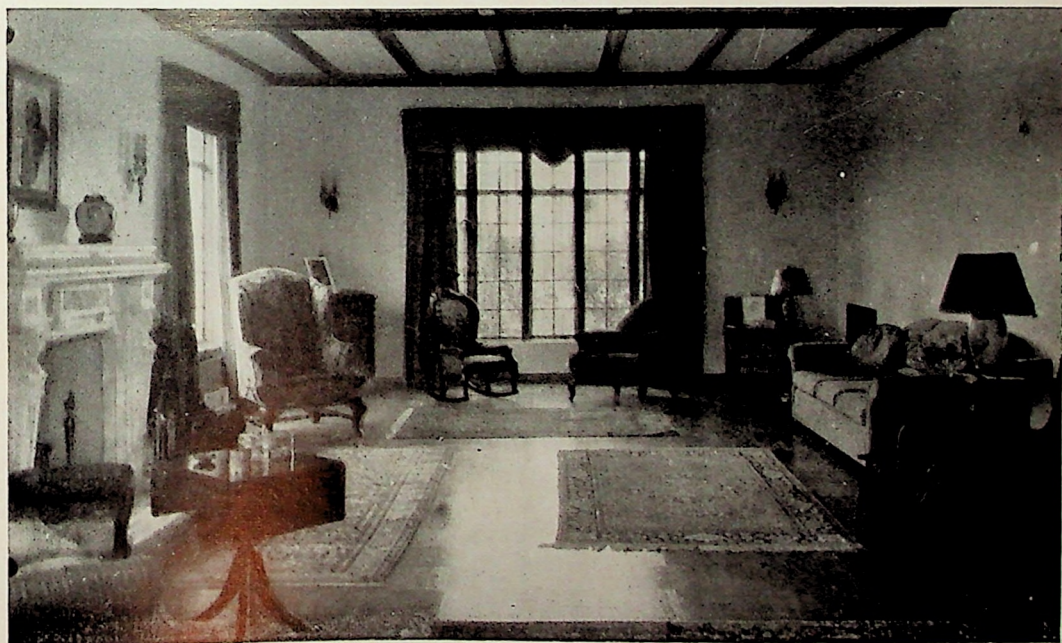
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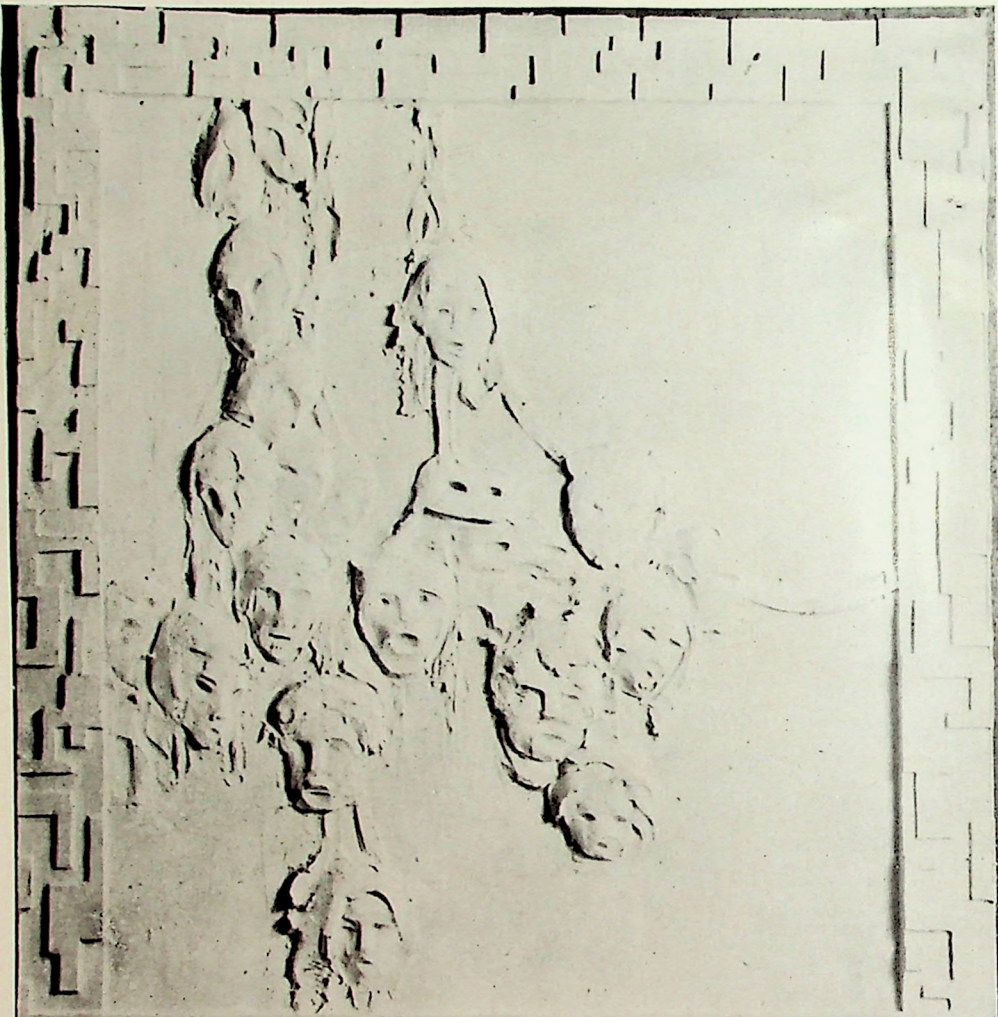
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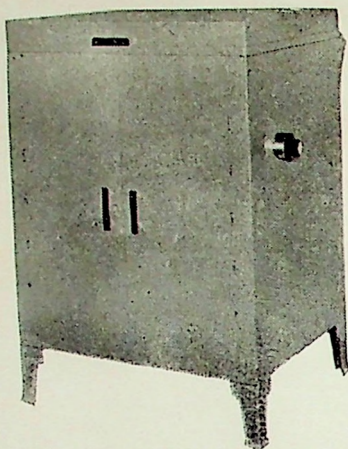
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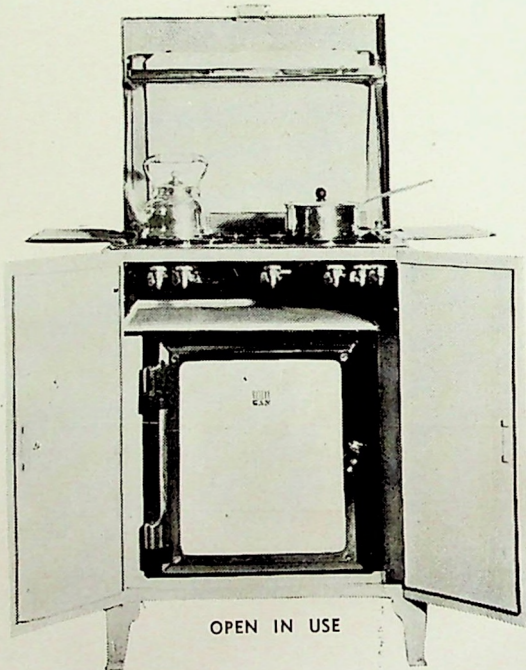




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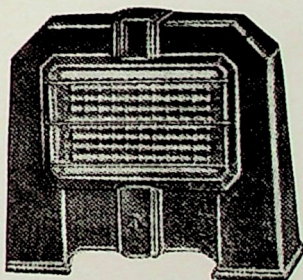


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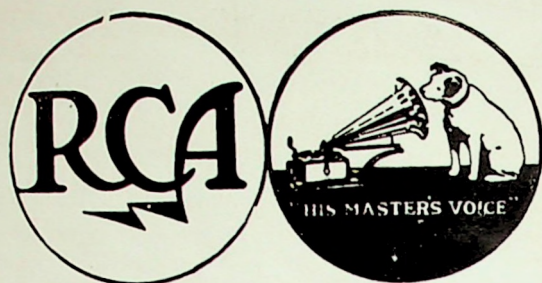
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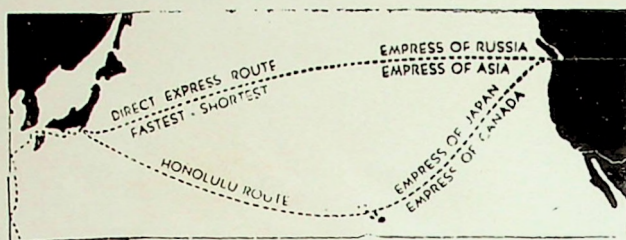
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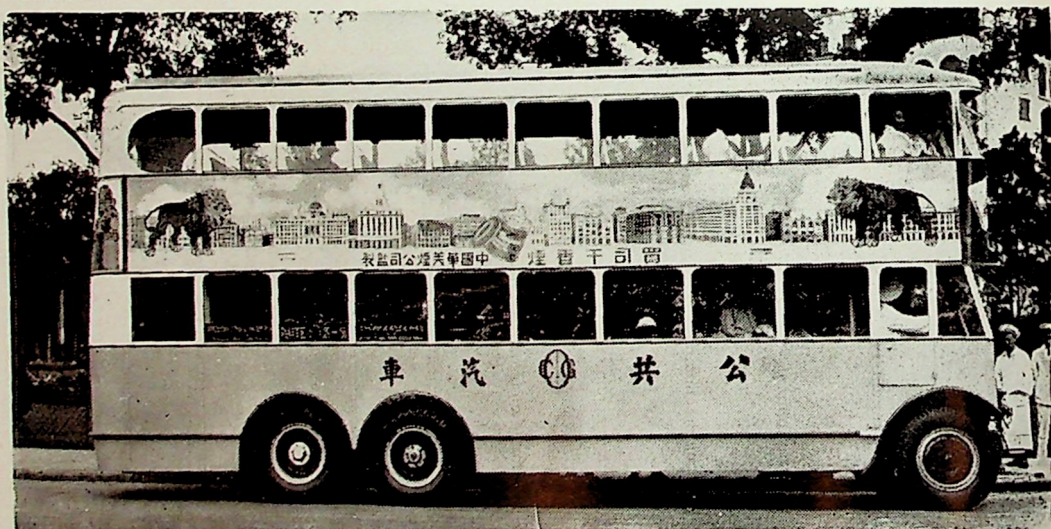
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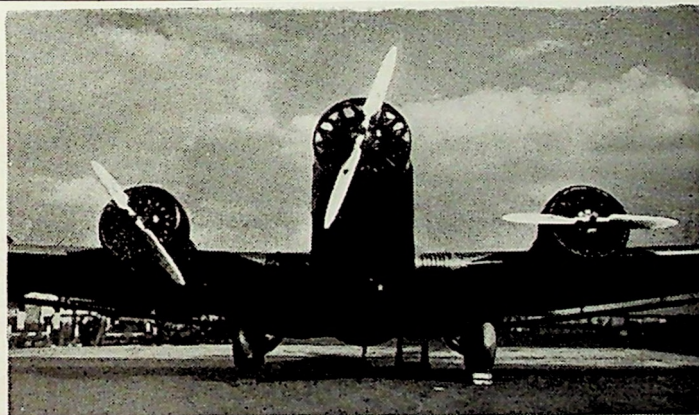
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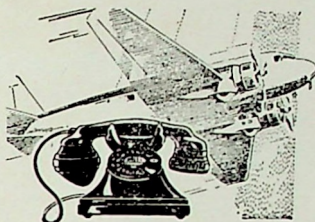
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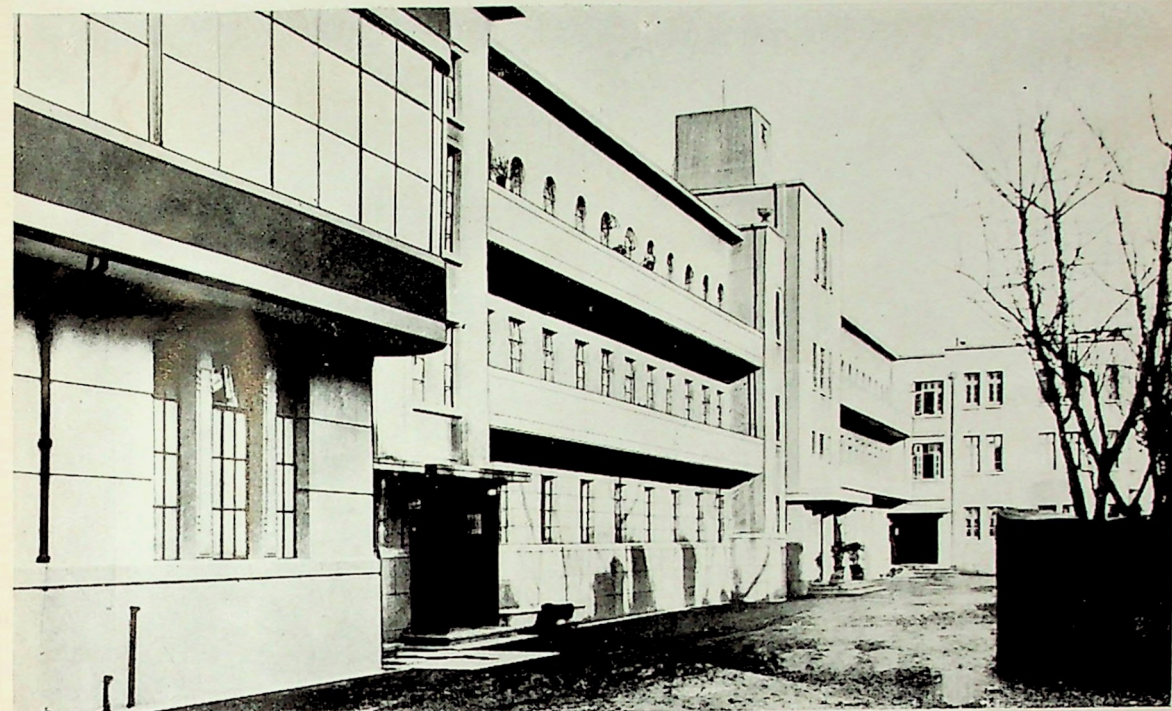
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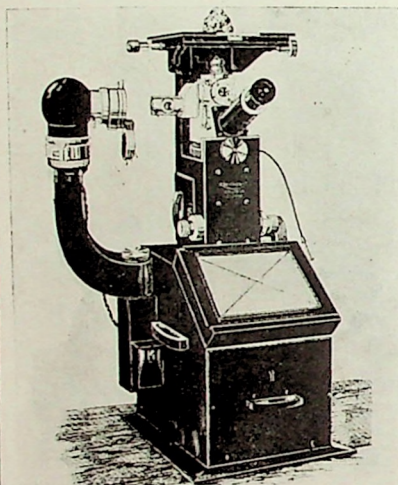


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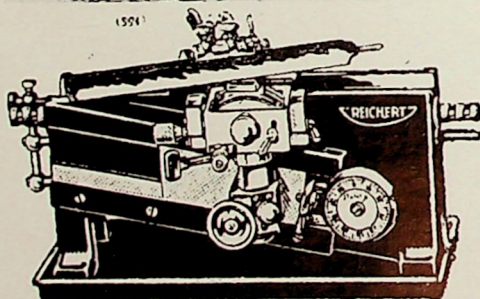
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THE CHINA JOURNAL

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Editor: ARTHUR DE C. SOWERBY, F.Z.S.

Manager: CLARICE S. MOISE, B.A.

[ENTERED AT THE CHINESE POST OFFICE AS A NEWSPAPER]

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Books for review should be sent to the Editor as early as possible.

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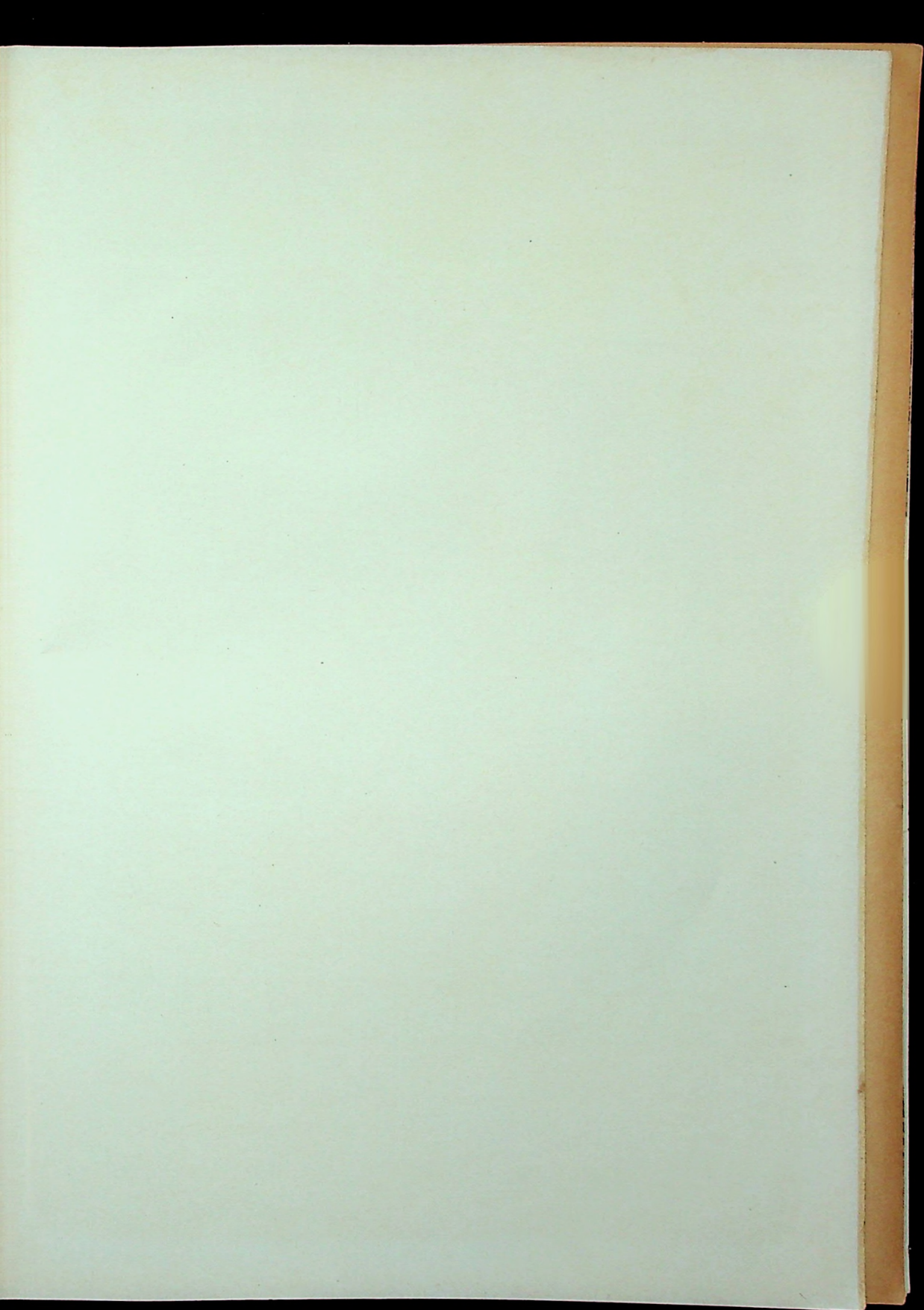
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KING GEORGE V

THE
CHINA JOURNAL
中國雜誌

VOL. XXIV

FEBRUARY, 1936

No. 2

LE ROI EST MORT: VIVE LE ROI!

It is only a few short months since the people of the British Empire were joyously celebrating the twenty-fifth anniversary of His Majesty King George V. To-day the Empire mourns his death. On January 20 King George passed away peacefully at Sandringham, surrounded by the members of the Royal family. It is recorded that almost his last words were an enquiry of the Prime Minister, who had been summoned to his bed-side, concerning the welfare of the Empire. His thoughts were always of and for his people, and his people, scattered throughout the world, honour his memory for the truly great King that he was.

He was buried in the vaults that lie beneath St. George's Chapel at Windsor on January 28, upwards of five hundred thousand people passing through Westminster Hall on the preceding day to pay their last respects to their beloved Sovereign lying there in state.

To the people of those countries which have lost the tradition of kingship it may seem strange, not to say incongruous, in one breath to announce the death of one monarch and hail the accession of another, but, in actual fact, it is a reminder that there is always a King at the head of the country, and that the moment death claims the ruling monarch his heir assumes his royal office.

Thus there is nothing disrespectful to the King who has just passed away in his loyal subjects' solemnly repeating the phrase "The King is dead: long live the King!" as they receive and pass on the sad news of his death.

All thoughts naturally turn to the one on whose shoulders falls the responsibility of kingship, and the people of the British Empire everywhere are congratulating themselves upon the high qualifications of His Majesty King Edward VIII to fill what is probably one of the most difficult rôles the world to-day has to offer.

A great deal is heard these days concerning "Imperialism," more especially from the members of the newer Republics, and frequently the

British Empire is the butt against which the bitterest taunts are hurled. But what is, perhaps, not fully realized is that the British Empire and British Imperialism are no longer the Empire and Imperialism of old. Although there is a King-Emperor at the head of it, the British Empire now partakes almost entirely of the nature of a Federation of more or less independent States, each entirely self-governing, each with its own laws, but all bound together by traditions deeply rooted in the past and symbolized in their beloved Sovereign.

It is for this reason that the people of Canada, Australia, New Zealand, South Africa, India and the host of smaller colonies in the far-flung Federation that is the British Empire mourn with deepest sincerity the passing of King George V, and hail with enthusiasm the accession of King Edward VIII.

Le Roi est mort: vive le Roi!

EVENTS AND COMMENTS

The Year of The Rat

According to age old Chinese tradition we have just entered upon the Year of the Rat. Being the first of the series of animals of the twelve-year cycle of Chinese chronological reckoning, the year of which it is the symbol is supposed to be a propitious one. The animals of the cycle, often wrongly called the Chinese Zodiac, in their proper order are the Rat, Ox, Tiger, Hare, Dragon, Snake, Horse, Sheep (or Goat), Monkey, Fowl, Dog and Pig. The origin of this system of chronology is not definitely known, but it goes back in Chinese literature at least to the first century A.D., Chavannes claiming that it was introduced into China by the Hsiung Nu. Some claim that it is of Egyptian origin. This, however, is extremely doubtful.

Whether or not the fact that this is considered a lucky year is responsible for the marked recrudescence of Lunar New Year festivities this year in China it is impossible to say, but it would almost seem so. It is hard for a people to give up its ancient traditions, and the Central authorities do well not to press the abolition of the latter too hard. In Europe when Christianity was introduced it was found necessary to adopt the old pagan festivals and to make the Christian calendar fit in with them, since it was impossible to make the people of the newly Christianized countries give them up. In time, as the masses in China become more enlightened, the ancient superstitions and beliefs and the customs based upon them will be abandoned, but in the meanwhile we cannot help feeling a certain amount of sympathy toward the ignorant of this country in their celebration of the advent of what they consider a year of good omen, the more especially as they have been passing through a period of unprecedented depression and national crises.

Associated with the Rat is the God of Wealth, a fact which elevates the humble and frequently pestiferous rodent to a high place of honour.

Especially fortunate throughout the coming year, runs the belief, will be those who encountered a Rat on the first day of the old Chinese New Year, which fell on January 24.

**Morality To
Save China**

No matter to what extent we sympathize with the people of China, however, for clinging to old traditions, we find ourselves in complete accord with Generalissimo Chiang Kai-shek, now President of the Executive Yuan, when, in his speech of January 4 which was broadcast from Nanking and was especially addressed to students, he said that only the underlying principles of the New Life Movement—politeness, righteousness, incorruptibility and moral responsibility—could save China from the evils that beset her, not empty slogans such as "Down with Imperialism," and, we might add, faith in the efficacy of the "Rat" and other superstitious beliefs.

The form of government in a country is of very secondary consideration when compared with the standards maintained by those who carry it out. Uprightness and unswerving fidelity to duty in all classes alone can make a country great and strong. Especially important is it at this time of stress and national danger for officials, high and low, to be sincere and honest in their dealings and fearless in carrying out their duty. But they must also be backed up by the people. Right is more sure to win than might; and righteousness and justice are more potent than aeroplanes and battleships. Generalissimo Chiang Kai-shek is right when he says this.

**Japan And
China**

There are not wanting signs that the application of this principle is bearing fruit in the progress being made toward an amicable settlement of outstanding differences between Japan and China. In international dealings sincerity and honesty of purpose coupled with fidelity in carrying out agreements are a *sine qua non* if real headway is to be made. The Chinese Government has demonstrated its good faith by suppressing anti-Japanese propaganda in the country's press and in persuading the student classes to abandon outward demonstrations of hostility toward Japan. But, naturally, it cannot remove from the hearts of the Chinese people the bitter feelings that certain actions on the part of Japan during the past few years have engendered. Only the Japanese can do that by meeting the Chinese half-way and extending the hand of friendship in all sincerity and honesty. In other words, if anything lasting in the way of a peaceful settlement is to be arrived at, both the Chinese and Japanese must approach the forth-coming conference in Nanking in a sincere spirit of reconciliation and goodwill. Each must be ready to see the other's viewpoint and willing to concede to the other's needs and legitimate desires as far as possible. So, and so only, can a satisfactory conclusion of the conference be reached.

**Shanghai
Municipal
Elections**

There is a persistent rumour to the effect that the Japanese section of the Shanghai International Settlement community is contemplating capturing one more seat on the Council at the forthcoming Municipal

Elections to be held on March 23 and 24. Hitherto by tacit consent of all parties concerned the nine foreign seats on the Council have been divided in the ratio of five British, two American and two Japanese. This has been based on national representation in the Settlement in the matters of population, vested interests and taxation. Recently there seems to have developed a feeling in the Japanese section of the community that it has not been adequately represented on the Council. Following are the figures issued recently by the Election Committee appointed by the British Chamber of Commerce, the China Association of Shanghai and the British Residents' Association of China with Lieutenant Colonel F. Hayley Bell as Agent. They speak for themselves, showing very clearly how matters actually stand.

Investments: British, £151,000,000; Japanese, £44,000,000; American, £26,000,000.

Percentage of Municipal Rates paid by Foreigners: British, 42½; American, 15; Other Nationalities, 18.

Payment of Land Tax: British, 82 per cent.; Japanese 7 per cent.; American, 6 per cent.

Registered Voters at last Elections: British, 1,234; Japanese, 893; American, 400; Other Nationalities, 1,273.

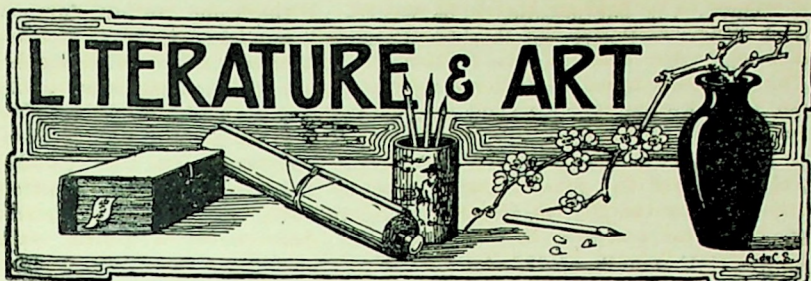
It will be seen that, no matter from which viewpoint the matter is considered, the British dominate the situation, and, in view of the fact that their voting capacity has been thoroughly organized, there is no doubt that they can maintain that dominance at the polls should they so desire.

* * * *

**Raven And
Brown
Sentenced**

After a protracted trial in the United States Court for China on sixteen charges involving embezzlement, fraudulent conversion, false pretences and larceny by trickery in connection with their official positions and dealings with the American-Oriental Finance Corporation, one of the affiliated companies of the American-Oriental Banking Corporation now in liquidation, Mr. Frank J. Raven, President and Director, and Mr. John Warner Brown, Vice-President and Director, respectively, of the former company, were convicted by Judge Milton J. Helmick on seven of the charges on February 1. Mr. Raven was sentenced to five years' and Mr. Brown to two years' imprisonment on each of the counts, the sentences to run concurrently. This comes as a sequel to the closing of three financial concerns, known as the Raven group, in Shanghai on May 24 last year, thereby causing considerable losses and great suffering to many depositors and investors in the concerns. The three concerns were the American-Oriental Banking Corporation, the American-Oriental Finance Corporation and the Raven Trust Company, all three of which are in the process of being liquidated, with Mr. Frank L. Hough as liquidator.

A. de C. S.



THE CHINESE LION

BY

ARTHUR DE CARLE SOWERBY

Although the lion is not indigenous to China, and, as far as is known, has never occurred in this country in a wild state, even in prehistoric times, the *shih-tzu* (獅子), a fearsome looking beast called the lion, appears in Chinese art with a frequency second only to the *lung* (dragon) or the *fêng-huang* (phoenix). Were it not for the fact that we know the Chinese name was applied to real lions sent to China as tribute in the Han period, we would be almost justified in assuming that the *shih-tzu* was a purely fabulous animal, having evolved as a figment of the human imagination without any counterpart in nature, so different is it from the animal it is supposed to represent.

Indeed, the *shih-tzu*, as it is portrayed to-day, is far more like a caricature of a Pekingese pug than a lion; so much so, indeed, that it is obvious that the modern Chinese craftsman and even artists who adhere to what is called the old style in Chinese art have in their mind's eye examples of this dog, also known as the *shih-tzu kou* or lion dog,¹ rather than to the lion as we know it. For this reason, then, the Chinese lion may be classified as a mythical animal along with the *lung*, the *fêng-huang* and the *chi-lin* (kylin), or, to give them the names commonly applied to them in English, the dragon, the phoenix and the unicorn.

Two questions as to the origin of the so-called Chinese lion present themselves to the mind of the investigator, one having regard to the manner in which the lion found its place in Chinese art in the first instance, the other being concerned with its deterioration into something closely resembling a popular breed of Chinese dog.

Eminent authorities, such as the late Dr. Berthold Laufer and Mr. W. Percival Yetts, have discoursed engagingly upon the first of these two questions, but so far no attempt appears to have been made to answer the second.

¹ While the term *Shih-tzu kou* properly speaking applies to the rough-haired type of pug designated the "apso" or Lhasa terrier by the Kennel Club of England, the writer has frequently heard it applied by the Chinese in the interior to ordinary Pekingese pugs.

Under the sub-heading "The Motive of the Lion" in his famous work "Chinese Pottery of the Han Dynasty," published in 1909, Laufer says that the lion was unknown in the antiquity of China. By this he appears to mean in pre-Han times, for he tells us that the word *shih-tzu*, meaning lion, is first mentioned in the Hou Han Shu by Pan Ch'ao (31-101 A.D.) where it says that in the 10th Moon of the 11th Year of the Emperor Chang Ti (87 A.D.) lions were sent as tribute by the King of the Yueh Chi to the Han court when he asked for the hand of a Chinese Princess in marriage. Again in the winter of 101 A.D. the Emperor Ho Ti received a present of lions from Parthia (An Hsi) and in the sixth month of 133 A.D. the Emperor Shun Ti received a present of a lion from Kashgar. On one of the pillars belonging to the tomb of the Wu family it is recorded under the date 147 A.D. that an artist named Sun Tsung made stone statues of lions at a cost of 40,000 cash. Unfortunately, says Laufer, these lions have been lost.

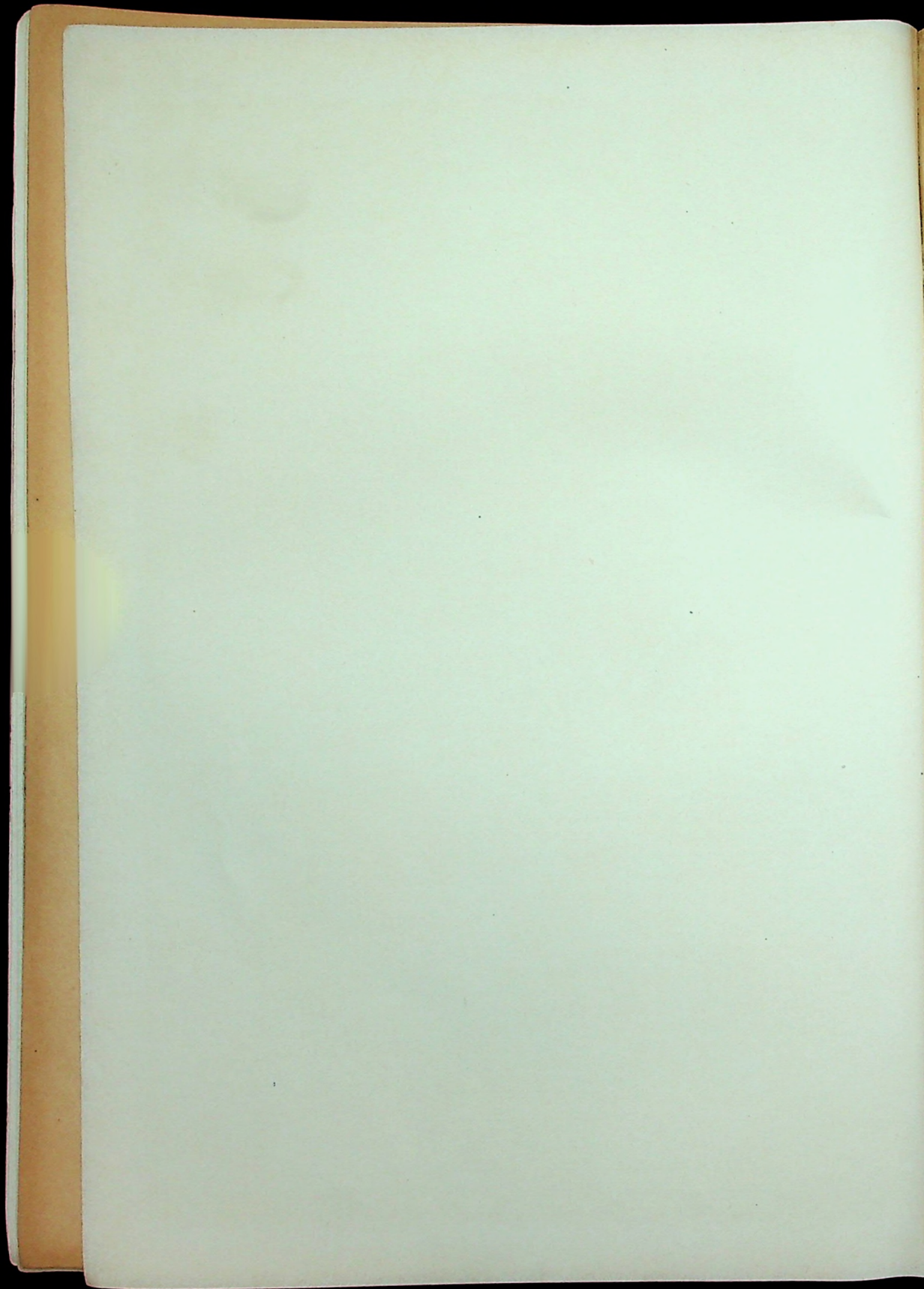
It is, indeed, most unfortunate, for it would have been extremely interesting to see what form these stone lions took, more especially as Laufer describes certain feline forms, executed in low relief on the decorative bands of Han pottery urns, as rather natural representations of the lion, but which it is here suggested were really meant for tigers. As far as can be seen from the figures given by Laufer there is no sign of a mane in any of these feline forms, which there certainly would have been had they been intended to represent lions. On the other hand, they form parts of what are undoubtedly hunting scenes with boars, deer and other animals, such as appear to have been a favourite theme in the Ch'in and Han periods. He calls attention to the wild boar and mounted archer *motifs* in these scenes as having been derived from Mycenaean and Greek art through the medium of Scythian and Old-Siberian art; and, because Mycenaean and Greek portrayals of the chase included the lion, he assumes that the large felines shown in similar scenes in Han art were lions. There are, however, plenty of examples in Han and earlier art of hunting scenes in which the tiger is unmistakably represented; indeed Laufer himself in his closing paragraph on the subject calls attention to "the great predilection for the boar and the tiger on the reliefs of the Han pottery" and says that "the tiger, according to Reinach almost unknown to Greco-Roman art, is a frequently treated subject in ancient Scythia and Siberia."

If the theory be correct that the hunting scenes in Ch'in and Han art, showing the *motifs* of archers on horse back, wild boars galloping and large felines, were derived from Scythian and Siberian art, in which tigers are a favourite *motif*, then it would seem more reasonable to assume that the felines in the Ch'in and Han hunting scenes were supposed to be tigers, the more especially as the tiger is indigenous in both Siberia and China and was very abundant in those times. The figure described by Laufer as a lion with a spear thrust into its head is shown with the head bent forwards and downwards so that the neck is strongly arched, and it is this arching of the neck which suggests that the lion has a mane, an impression, however, which is immediately dispelled on a close examination.



THE CHINESE LION

One of a Pair of large Red Lacquered Wooden Lions showing well the Characters of the Conventionalized Chinese Lion of recent Times. Note the Sun Sphere and the Cubs.
Sowerby Collection,



Laufer also calls attention to certain mirrors of the Han period decorated with patterns of grape vines and animals, among which are sometimes what the late Professor Hirth, who made a special study of this group of mirrors, calls "lions with unmistakable mane." "The mane of these lions," says Laufer, "is always sketched in the conventional style of spirals; the head is clumsy and misdrawn, but the outlines of the body, and the bushy tail, are not badly executed." He concludes that these lions are not related to the Indian Buddhist figures of lions, but must have come from another source, particularly as there is no question of any Buddhistic influence during the Han period. He points out that the lions on the mirrors do not resemble the supposed lions on the Han pottery, and assigns them to a later date though still in the Han period.

As a matter of fact both Hirth and Laufer were wrong in attributing mirrors with the grape and animal design to the Han period. Consensus of opinion now places them as belonging to the T'ang period. According to Rupert and Todd, whose book "Chinese Bronze Mirrors" appeared last year, this *motif* is known to the Chinese as the *hai ma p'u t'ao* or, literally, the "sea horse and grape" design, and the reason why it was originally assigned to the Han period was because "the grape vine is traditionally supposed to have been brought back to China from Bactria by the warrior and explorer, Chang Ch'ien, in the latter part of the second century B.C."

There can be no doubt, however, that this interpretation is not the correct one, nor is the inference drawn by Yetts in his "Symbolism in Chinese Art" to the effect that "when occurring in company with the grape vine, as it does on the mirrors, the lion doubtless stands for an attribute of Dionysius," at least in connection with Chinese art. Yetts further says that the kind of lion borrowed from European art, that is, Mycenaean and Greek art, bore a strong resemblance to nature in contrast with another lion that appeared later which had no living prototype. With regard to the latter he is referring to "the snarling monster loaded with shaggy mane and fantastic curls so often represented in pairs at the entrance of temples and other buildings," in other words, the fabulous Chinese lion of more recent times. "This," he says, "is the conventionalized lion of India, one of the followers in the wake of Buddhism and one which by virtue of its religious significance has persisted to the present day." In this he is undoubtedly right.

In view of the facts that the felines in the hunting scenes on Han pottery are not lions but tigers, or possibly even leopards, and that the bronze mirrors with the lion and grape design belong to the T'ang period, the temptation would be to conclude that the lion did not appear in Chinese art till post-Han times, were it not for the reference to the stone lions on the pillar belonging to the Wu family and dated 147 A.D. This indicates that the lion *motif* had already appeared in Han times, a fact which is corroborated by the existence of a large stone statue of a lion guarding the grave of Kao Yi of the Han period near Ya-chou in Szechuan, a photograph of which is reproduced on page 309 of Otto Fischer's "Die Kunst Indiens, Chinas und Japans," published in 1928. In this remarkable figure the mane is treated in such a way as to suggest wings, an extremely interesting feature, for in certain large stone

statues of lions of somewhat later periods definite wings take the place of the backward flowing locks of the lower part of the mane in the Kao Yi lion. Fischer's book pictures several other stone lions, namely, one found at the site of the grave of the Emperor Wu Ti of the Ch'i Dynasty (483-494 A.D.), a fine pair guarding the approach to the grave of Hsiao Ching of the Eastern Wei Dynasty (534-543 A.D.), and one at the grave of Hsiao Hsiu, all in the vicinity of Nan-king. It is difficult to say whence came the inspiration for these lions, the more especially as they do not bear any resemblance to the lions of Greek or Assyrian art, nor yet to those of Indian Buddhistic art. They are all shown standing, heads erect with obvious manes, and have long tails with tufts at the ends. But the manes are either done with a few regular curved lines indicating the locks, or in a solid mass with nothing to indicate the hair. In no case are the close spiral curls of the lions of more recent times present. Two features, however, of the modern Chinese lion are to be found in these early stone lions, namely, the wide square muzzle and great gaping mouth with pronounced canine teeth at the corners and the large bulging eyes. These are not features of the Indian Buddhistic lion, in which the head and face are really naturalistic. They are also always in pairs and placed as guardians, usually, it would seem, of the approaches to the graves of important personages.

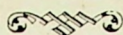
It would appear, then, that in these early stone lions we have the real origin of the present day Chinese lions, which, are also always executed in pairs and placed as guardians at the entrance to buildings, formerly of a sacred or official nature, but latterly of any and every description. As to how the early Chinese conceived of the lion as a *motif* in the first place, it would almost seem that their idea of this animal had been evolved on Chinese soil, being derived, probably, partly from the living lions sent to this country as tribute and partly in the artist-craftsman's imagination. Later, under the influence of Buddhistic art, the lion in Chinese art began to change, taking on some of the characteristics of the conventional Indian lion, in which the mane is shown in the form of numerous short spiral curls or short wavy locks.

The lion of Indian art, however, is represented with a long tail with an ordinary tuft at the end, whereas the modern Chinese lion is always shown with a short very bushy tail held high over the back like that of a dog.

It is interesting to note that the lions on the T'ang mirrors are very life-like, that is to say, they have the real leonine head and mane, well proportioned legs and long tail with an ordinary tuft at the end. They closely resemble the lion of Indian art. On the other hand, certain large stone lions guarding graves of the T'ang period, notably a pair at the grave of the Empress Wu Hou at Chuan-ling near Si-an Fu in Shensi, show a combination of the characters of the Indian lion and the winged stone lions of earlier periods in China already mentioned. While they have no wings, the body, tail and mane are very naturalistic, as in the Indian lion, but the faces, with their broad muzzles and square mouths, are those of the early Chinese stone lions.

It will be seen that up to the T'ang period there was no hint whatsoever of the pug dog in the lion of Chinese sculptural art. But,

THE CHINESE LION



A Stone Lion at the Grave of Kao Yi, Han Period, near Ya-chou in Szechuan. Note the Treatment of the Mane to form Wings.



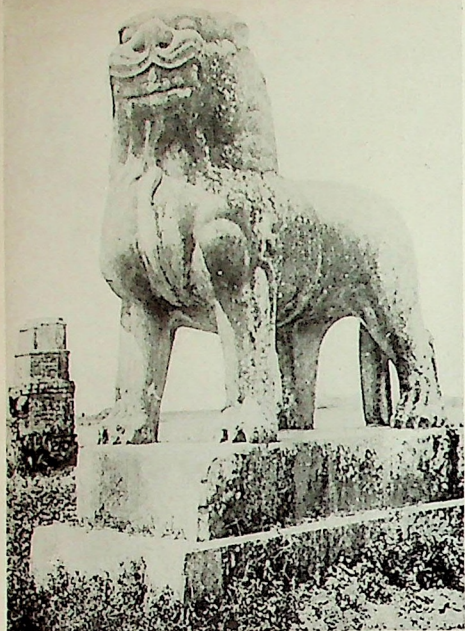
A Stone-Lion at the Grave of Emperor Wu Ti of the Ch'i Dynasty near Nan-king. Note the Development of the Mane into definite Wings and the long Tail.



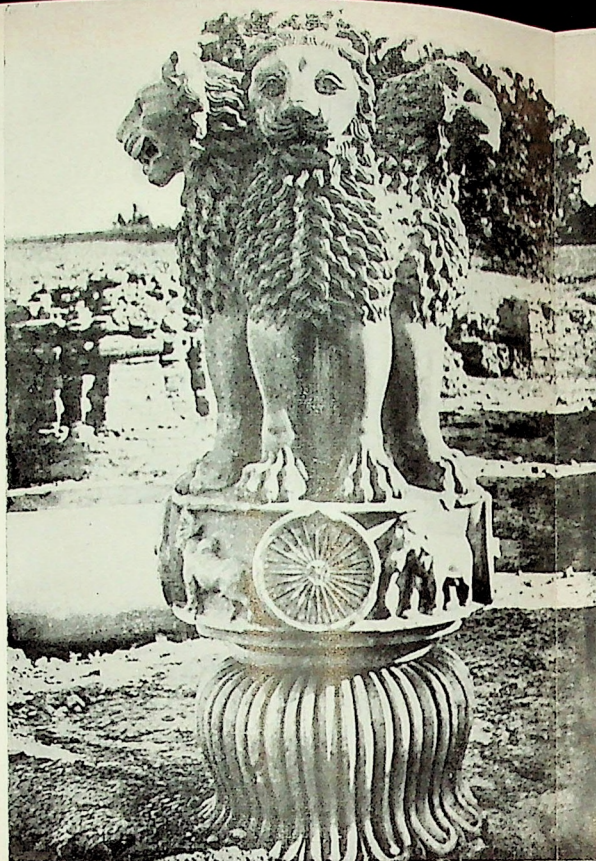
Large Stone Lions guarding the approach to the Grave of Hsiao Chi near Nan-king. Note the massive Manes, large Wings and long Tails.



These Pictures are from "Die Kunst Indiens, Chinas und Japans" by Otto Fischer. Courtesy Propyläen-Verlag, Berlin.



One of a Pair of large Stone Lions at the Grave of Empress Wu Hou at Chuan-ling near Si-an Fu. Note the long Tail. T'ang Dynasty.



On the Left are Stone Lions from the Palace of Asoka in the Sarnath Museum, India. They are good Examples of the conventionalized Lion of Indian Buddhistic Art which came to China in Pre-T'ang Times and influenced the Chinese rendering of the Lion. From "Die Kunst Indiens, Chinas and Japans."

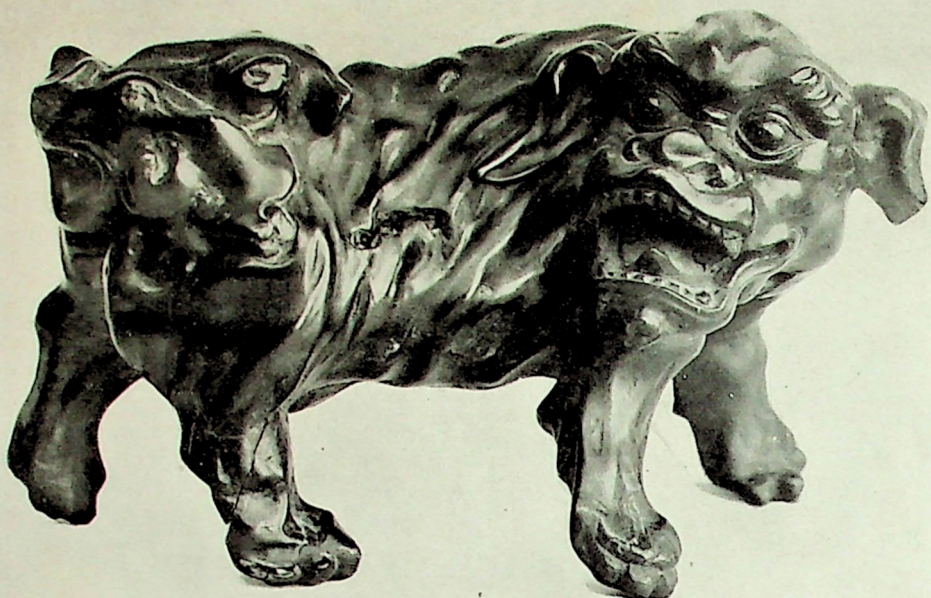
Above are small Bronze Lions of various Periods showing Transition from the Naturalistic (Right) to the extremely Conventionalized (Left). Sowerby Collection.



On the Left is a horned Lion in Green Glaze on a Roof Tile. Above are a Pair of Dog-like Lions carved in Ivory. Sowerby Collection.



A Bronze Mirror of the T'ang Period showing the Grape and Lion Design. Note the Naturalistic Form of the Lions. Sowerby Collection.



A Lion carved from Tea Root. Note the long hanging Ears. This is a modern Product of Foochow, Fukien. Sowerby Collection.



A pair of Ming Dynasty glazed Pottery Lions. Note their upright Ears, curly Manes and Bushy upturned Tails. Sowerby Collection.

commencing in that period and from thence on, the Chinese lion began to assume the characters of the Chinese pug dog, till, as already stated, the lions executed in China to-day, especially in Shanghai and southward, are little more than caricatures of the well-known Pekingese pug, or "Peke," or the so-called Peking lion dog, Lhasa terrier or "apso."

There can be but one explanation of this strange transition from an animal of imposing and regal bearing to a grotesque monster, and that is that a certain resemblance between the stone lion and the pug dog was noticed, giving rise to the name of *shih-tzu kou*, or "lion dog," for the latter. That the pug dog was already in existence in China at this early period is amply proved by models of these animals found amongst the pottery tomb figures of T'ang and even Han times.

As time went on Chinese craftsman, not having any real lions to work from, became more and more influenced by the appearance of the little "lion dogs" they had in their homes, till, in the end, the dog, originally named after the lion, itself became the model for the lion in Chinese art, and we now have so-called lions carved in wood, stone, ivory and other materials that are practically identical with the Pekingese pug, having long hairy ears, upcurled tails, short hairy legs, high prominent foreheads, depressed noses, large bulging eyes and wide mouths. They are so far removed in appearance from the lion of nature as to be completely unrecognizable as such, and were it not for the facts that they are called in Chinese by the same name as was applied to the lions originally sent from Central Asia as tribute or presents to the Han court, and that we can trace their transitional stages back to the stone lions of that period, it is to be doubted whether they would ever have been called lions by Europeans.

In some, various features of a purely fabulous nature are shown, as, for instance, a single cone-like horn protruding from the crown of the head. This characteristic itself can be traced back to the T'ang Dynasty, as is evidenced by a large stone lion to be found at some graves of that period near Lo-yang in Honan, in which there is a distinct horn on the top of the head. A picture of this stone lion illustrates the article on Sung Shan by J. Hers which appears in the present issue of this journal. Another illustration in the same article shows two naturalistic lions in a carved stone tablet dated 570 A.D. which stands in the monastery of Shao Lin Ssu in the same general area.

To-day the Chinese lion is used almost entirely as a protection against evil spirits and influences, being placed in pairs on either side of the entrances to all types of buildings from majestic temples and palaces down to humble shops whose fronts open on to the streets, or singly on roofs facing one street entering another, or as tiles amongst rows of other fabulous animals on the side ridges of temple roofs, or in varying sizes on silken embroideries or woven into the design of carpets and rugs. Always they are associated with a sphere, supposed to be the sun, the male of the pair placed at the entrance to buildings almost invariably being shown with one forepaw on this sphere, the female facing him with one paw on a cub, and, not infrequently with

another cub climbing on her back. They take their place in Chinese art along with other mythical and semi-mythical animals, and symbolize guardianship and wisdom.

SHEN NUNG, ANCIENT PHARMACOLOGIST AND AGRICULTURALIST

BY

PAUL E. ADOLPH

As a missionary physician located in Ch'ang-chih in Shansi, China, the writer's interest in Shên Nung was aroused shortly before reaching his present sphere of service by a casual glimpse at a standard work on Chinese history in which the statement is made that the place where the ancient Emperor Shên Nung, the Father of Chinese Medicine, instructed the people in the cultivation of the five grains is located thirteen *li* (about five English miles) from the city of Lu-an Fu (latterly known as Ch'ang-chih), and the site is marked by a temple erected to his memory. After reaching Ch'ang-chih the writer's inquiry about this landmark was for several years fruitless, as the local people seem to have little interest in such matters. Finally recourse was had to the archives of Ch'ang-chih County, in which much information is recorded about such antiquities as these.

Shên Nung (神農), also called the Divine Husbandman, is supposed to have reigned from 2838 to 2698 B.C. It is said that he was of the race of people who now constitute the Miao tribes in Kueichou Province. It is also reported that in his day what is now the Ch'ang-chih plain was a lake, and that only the T'ai Hang Mountains were not submerged. Geologically speaking this is quite probable. It is likewise interesting to note that the two places of interest to which his name is attached, namely, his pharmacological and agricultural laboratory and his tomb, are located in these mountains distant from each other about a hundred *li* (thirty-five English miles).

It is our purpose to set forth what information we have been able to obtain by word of mouth, by searching the local archives and stone tablets, and by observations made in the district. The last we have in some instances recorded photographically.

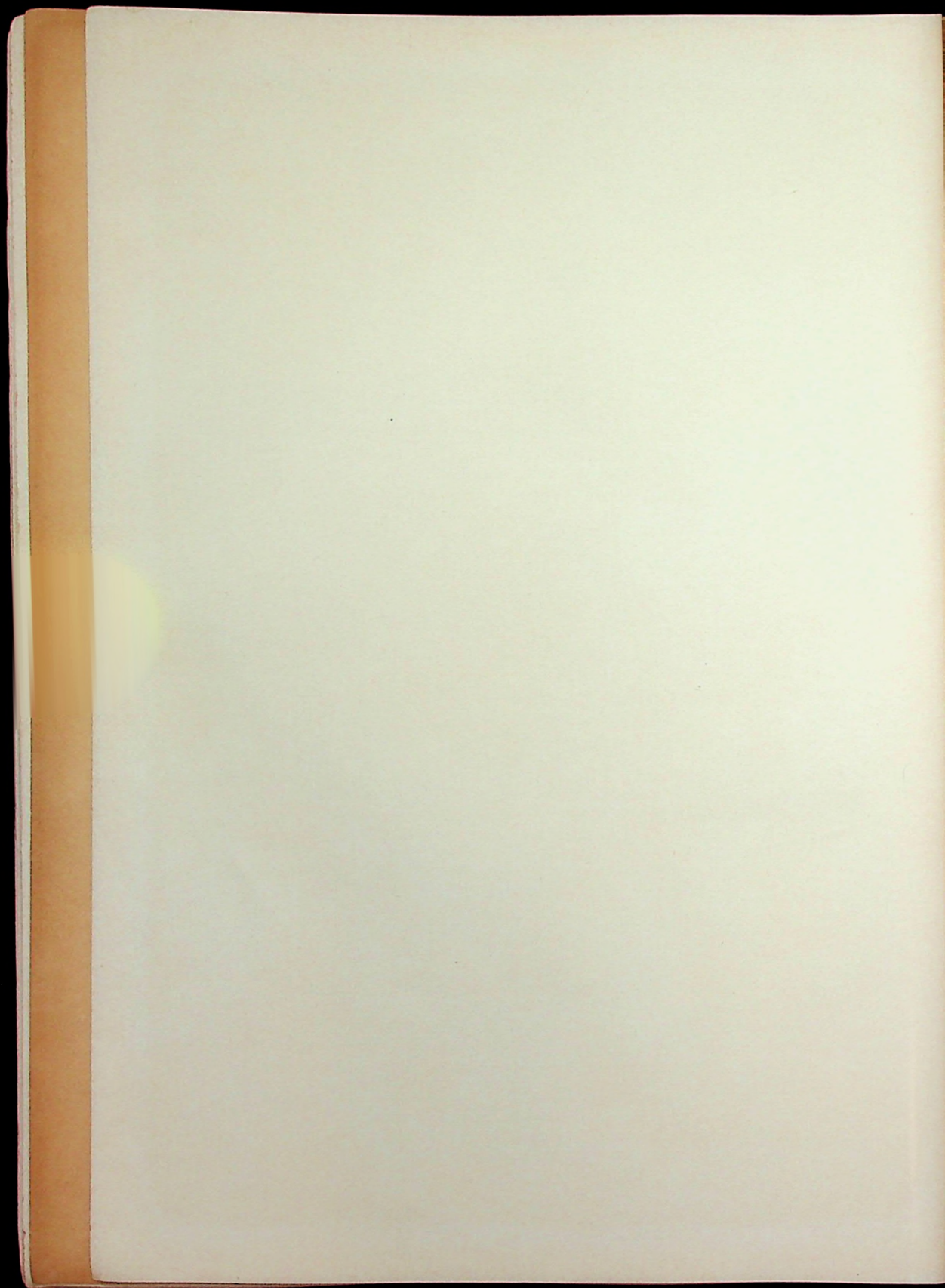
SHEN NUNG'S PHARMACOLOGICAL AND AGRICULTURAL LABORATORY.

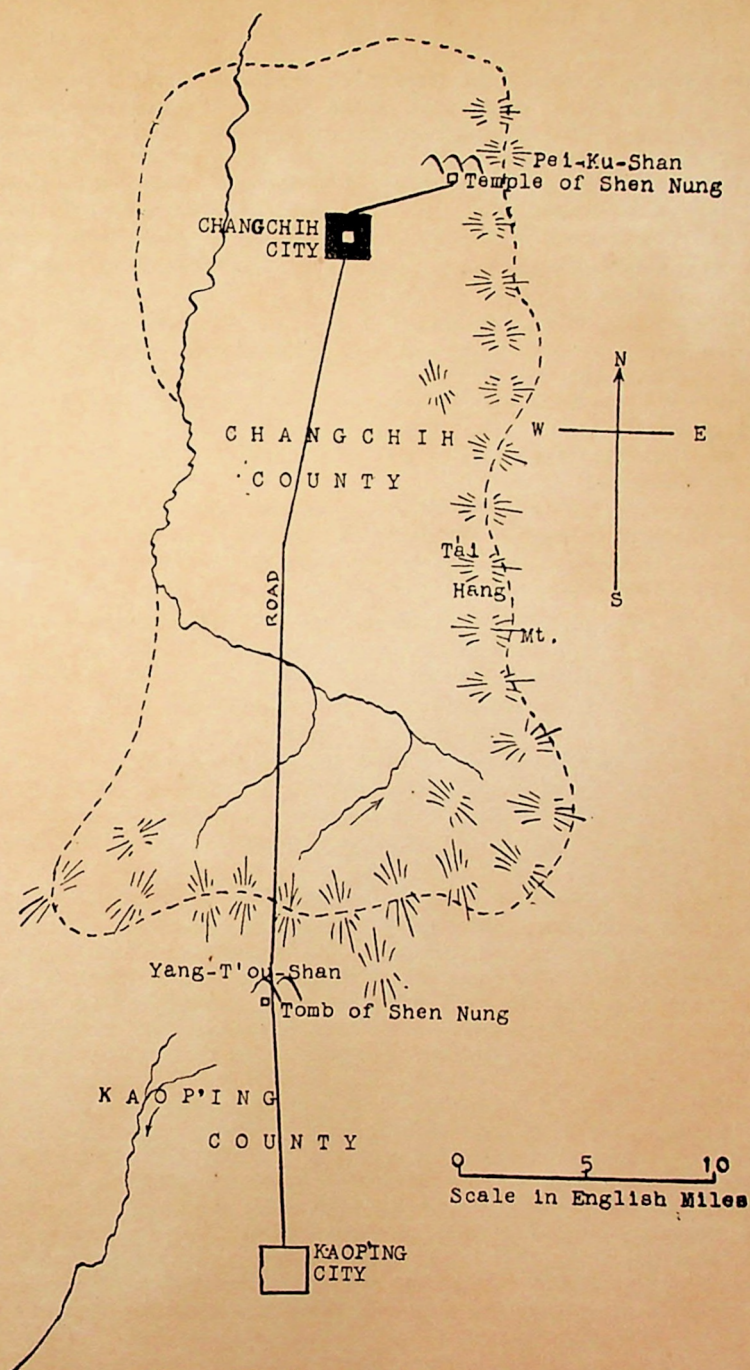
It is to Pei Ku Shan in Ch'ang-chih County that tradition ascribes the honour of having been the place where Shên Nung tasted herbs for their medicinal properties, and discovered the five grains or cereals. These discoveries made in the fields of pharmacology and agriculture seem to have led to a definite change in the manner of life of the inhabitants



SHEN NUNG THE DISCOVERER OF DRUGS AND AGRICULTURE

The Image of Shên Nung in the Temple in the Pei Ku Shan in Shansi. In his Right Hand he holds two Stalks of Millet, in his Left a Medicinal Plant, while behind him is a Cup containing what is evidently a Concoction made from Medicinal Herbs.





Map of Chang-chih County and Environs, Shansi, China.

of the country, namely, from that of a nomadic meat-eating people to that of a vegetarian people with settled abode. It apparently marks the beginning of what in later centuries matured into the great systems of medicine and agriculture such as have been practised by the Chinese during past centuries. Despite the faults which we may find in these systems, we must admit that the development of cities and of Chinese civilization in general would have been impossible without them.

We can do no better than to translate extracts from the Ch'ang-chih County Archives:

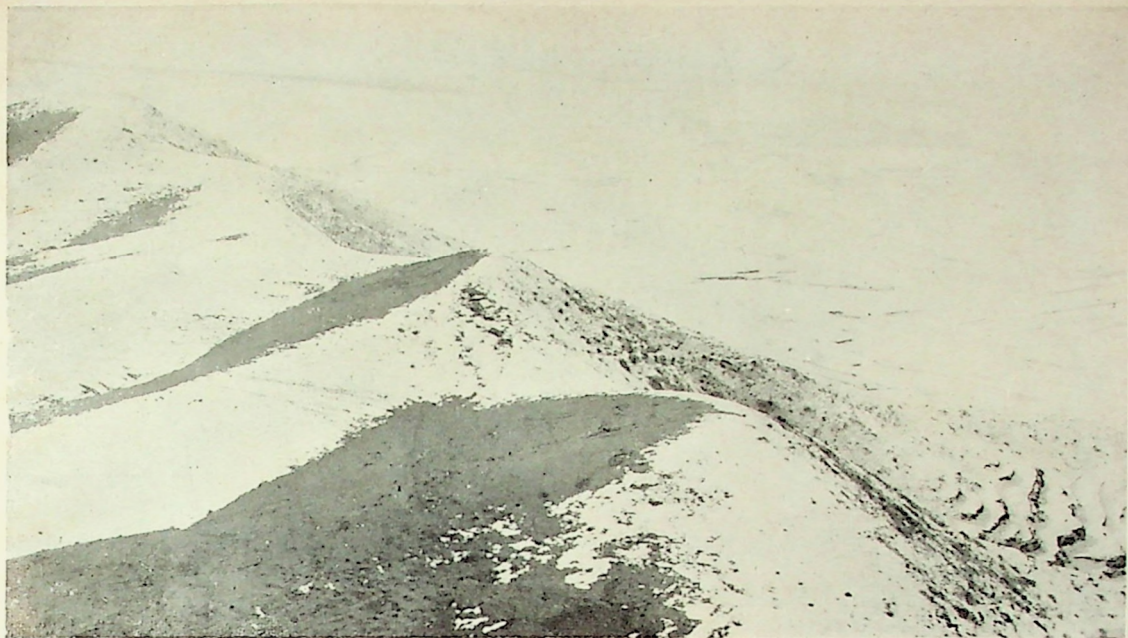
"The Hundred-Grain Mountain (百穀山, Pei Ku Shan) in the north-eastern part of the county, thirteen *li* from the city of Lu-an Fu (潞安府), is a high peak over three thousand feet above sea level. It is the highest of all mountains in Ch'ang-chih County (長治縣). Here is also located the Cedar Valley Monastery, and it is for this reason that the mountain has the alternative name of Cedar Valley Mountain (柏谷山 Pei Ku Shan).

"According to Lu-an Fu records tradition says that Shên Nung tasted the hundred herbs here. It is also said that he discovered the five grains at this place. Afterwards a temple was erected here to his memory. The temple and the statue are very ancient.

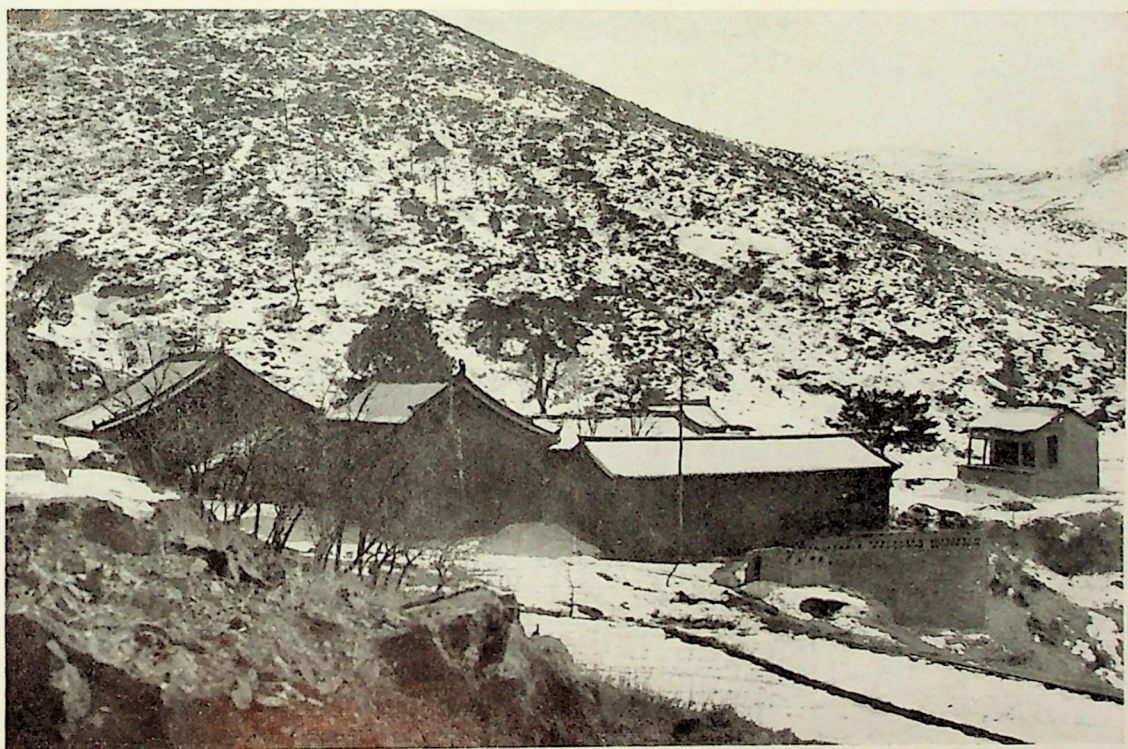
"At the time of the Pei Ch'i Dynasty (550-577 A.D.) it was repaired. In the Ming Dynasty in the fourth year of the reign of Emperor Hung Wu (1371 A.D.) it was again renovated. Again in the Ch'ing Dynasty in the twelfth year of the reign of Emperor Shun Chih (1655 A.D.) it was restored."

When the temple was renovated in the fourth year of the reign of Emperor Hung Wu of the Ming Dynasty, Wang Chi, then magistrate of Lu-chou (Lu-an Fu), erected a stone tablet on the temple site, which has been preserved to this day. The reading of this tablet may be condensed as follows:

"In the third year of Hung Wu an edict was promulgated for the restoration of the memorials of the gods of famous mountains and rivers. The statue of the Fire God, Shên Nung, is in the Lu district twelve *li* north-east of the city on a mountain called Cedar Valley Mountain (Pei Ku Shan). On this mountain, when one has ascended halfway to the top, is a hollow which overlooks the city and its environs. Here it was that the Emperor tasted the hundred grains. The temple is situated on the southern slope of the mountain. In the northern room was formerly situated the image of a Buddha, whereas the statue of the god (Shên Nung) was allocated to the side temple on the east which comprises altogether too narrow and cramped quarters. Shên Nung's resting place, however, is admitted to have the priority because of its exceedingly ancient character, and a mistake has been made in subordinating him. The imperial decree authorized the removal of the Buddhist images and the reinstatement of the statue of Shên Nung in the main temple because his merits among the people are beyond description. The rooms on the east and west of the main temple building are for the caretaker to



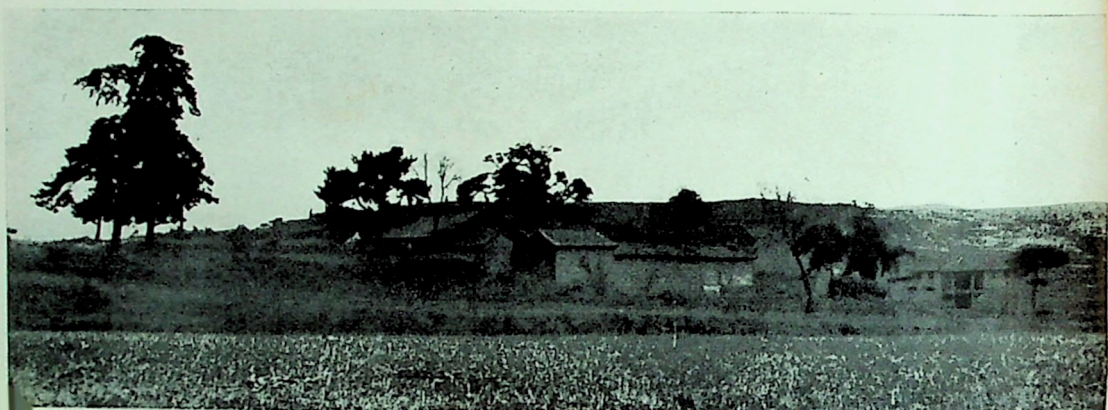
A View of the Plain on which lies Chang-chih City from Pei Ku Shan, Shansi, after a Fall of Snow.



The Temple of Shên Nung nestles in a Hollow half way up the Pei Ku Shan, Shansi.



The Entrance to the Hall containing the Image of Shên Nung. The Image can be faintly seen facing the Door, while on either side of the latter are Stone Tablets of considerable Historical interest.



Shên Nung's Tomb and Temple Buildings at Yang T'ou Shan, Kao-p'ing, Shansi. The Tomb is immediately to the Right of the tallest Tree.



The Mound of Earth which marks the Burial Site of Shên Nung at Yang T'ou Shan, Kao-p'ing, Shansi.

live in. Opposite the big gate is a theatrical stage and to the west is the temple of the sleeping Buddha."

The following is a translation of a poem composed by the Chinese poet, Wang To (王鐸) of the Ming Dynasty on the occasion of a visit to Pei Ku Shan:

A grassy road about the swarthy village wends its way;
It passes o'er a rocky slope into the firmament.
The T'ai Hang Mountains up to heaven's dome so near approach!
May mem'ry of the Fire-King-God's true merit ever live!
The valley wind from depths ascends to strum the cedar trees,
While thyme upon the cliff the path of former rains betrays,
And lofty stands the arbor vitae on the mountain height.
This ancient temple, may it be preserved forevermore!

SHEN NUNG'S TOMB.

Shên Nung's tomb is located on Sheep Head Mountain (羊頭山 Yang T'ou Shan) at Chung-li-ts'un near Huan-ma-chên in Kao-p'ing County (高平縣) thirty *li* (ten English miles) from Kao-p'ing City and ninety *li* (thirty English miles) from Ch'ang-chih City. It is on the southern slope of a high range of the T'ai Hang Mountains which divides the rivers of South-eastern Shansi into those which flow to the north and east into Hopei Province and those which flow south into Honan Province to empty into the Yellow River.

There is a large temple courtyard here with various images in it. The statue of Shên Nung, however, has been replaced by Buddhist images. Numerous stone tablets in this courtyard enclosure give interesting information about the tomb, which is located outside the courtyard on the north side in a fashion similar to that of the tombs of more recent Chinese Emperors, such as are to be seen at the Western Tombs in Hopei.

The most ancient of these stone tablets was inscribed in the Yüan Dynasty during the reign of Chih Ta (about 1308 A.D.). It records the ancient names of Kao-p'ing County and then speaks more specifically about the temple and tomb of Shên Nung thus:

"In ancient times there was a circular wall about the tomb which at some period in the past has been destroyed. . . . There is now no record extant as to when and by whom the temple was erected. The local inhabitants assert that Shên Nung gave instructions here as to how to grow the five cereals."

COMMENT

It will be noted that it is reported that Shên Nung gave instructions concerning the cultivation of the five cereals in both of these places. Of course, it is within reason to suppose that he actually did give these instructions at both places, but, in dealing with data concerning these matters, we must be ever mindful of the fact that these things concern themselves with the so-called legendary period of Chinese history.

Tradition dares not be scrutinized too closely in the matter of these details. Suffice it to say that we have records inscribed six centuries ago which state what was then known or surmised about these ancient landmarks. We have reviewed these inscriptions, and, upon visiting the sites concerned, have been impressed with the plausibility of their statements.

ART NOTES

Birds in Chinese Art: In his article "Birds in Chinese Art," which appeared in the December 1935 number of this journal, the writer of these notes listed fifty-five different species of birds definitely identified in Chinese paintings and other works of art. It would be interesting if records of other species of birds appearing in the art of this country could be kept, for which purpose the pages of this journal will always be open to contributors. As a start a pair of Oriental turtle doves (*Streptopelia orientalis*, Latham) appearing in a *k'o ssu* tapestry amongst those in the Chinese Art Exhibition being held in London may be mentioned. This tapestry belongs to the Palace Museum Collection, and is ascribed to the Sung Dynasty, but is probably of a later date. It shows the two doves, beautifully executed, sitting on the branch of a fruit tree in bloom, and is a really lovely work of art.

Palace Collection Not for America: A report that the Palace Museum Collection of Chinese art objects now on view at the International Exhibition of Chinese Art being held at Burlington House in London is to be shown next in New York has been definitely denied by a spokesman of the Ministry of Education in Nanking according to a *Central* message from that city dated January 28. The request put forward by the United States Government, said the spokesman, was refused by the Chinese authorities, as to grant it would be going against the original decision that the art objects should not be displayed in countries other than England. Following the conclusion of the London Exhibition the whole collection will be shipped back to China where it will be placed on display in Nanking for the benefit of the Chinese public. The report does not give the

name of the spokesman for the Ministry of Education, nor, so far as can be ascertained here, has it been confirmed.

Great Interest in Chinese Art Aroused in England: In the meanwhile interest in England in Chinese art has been greatly increased by the holding of this remarkable Exhibition, evidenced by a flood of articles on the subject which have appeared in the English newspapers and periodicals and the number of new books on various phases of Chinese art that have been published this winter. Amongst the latter are the following: "Introduction to Chinese Art," by Arnold Silcock: Oxford University Press. "The Chinese Eye, an Interpretation of Chinese Painting," by Chiang Yee: Methuen & Co., Ltd. "A Background to Chinese Painting," by Soame Jenyns: Sidgwick & Jackson, Ltd. "Chinese Art," edited by Leigh Ashton: Kegan Paul, French, Trubner & Co., Ltd.

The last of these was reviewed in these notes in the January issue of this journal. The others will be reviewed in due course, only brief notices being given here. The ambition of "A Background to Chinese Painting" is to provide a short account of the setting in which Chinese painting must be studied, and of the various influences that helped to shape the Chinese tradition of painting. It is intended for the general reader and no attempt has been made to compete with the more detailed works of reference on the same subject, which are given in connection with a list of authors at the end of the book. The author is Assistant Keeper in the Department of Oriental Antiquities in the British Museum. The book is well illustrated with reproductions of Chinese paintings in well known collections.

In "Introduction to Chinese Art" Mr. Silcock deals with the various phases of Chinese art according to periods, commencing with prehistoric times and the dawn of history and proceeding down through the ages showing the development of art and culture in this country. An architect who has spent several years in China and has already published an important work entitled "Chinese Architecture," he is well qualified for the task he has undertaken. He makes an effort to correlate the history of China with that of Western civilizations, giving special tables showing the parallelism of events and periods. We venture to suggest a perusal of these will surprise some of our readers.

The author of "The Chinese Eye" is both a poet and an artist, and his book will make its own appeal on this account, the more especially as painting and poetry go hand in hand in China. With the Chinese a painting is often a poem, and a poem is generally a word picture. Also it is no uncommon thing to find a descriptive or eulogistic poem actually written on a painting, the incomparably beautiful script adding to the beauty of the lines in the picture, just as the sentiment in the verse adds to the spirit of the painting. "The Chinese Eye" describes the intimate connection which philosophy and religion, as well as poetry, have with painting in the land of Confucius, and explains to the Western mind the significance of these inscriptions.

Young Shanghai Artist Lectures:

Miss Theodora Chatley, daughter of Dr. Herbert Chatley, head of the Whangpoo Conservancy, has recently returned to Shanghai after having taken training in England in art, especially in connection with the stage. Since her return she has begun to make herself felt in artistic and theatrical circles. Recently Miss Chatley delivered what was described in the daily press as a somewhat fiery

and frank lecture before the members of the Shanghai Art Club on the present low status of the scenery, stage settings and costume designs seen on the modern stage. The lecture was entitled "The Artist and the Theatre," and was listened to with keen interest by those who attended it. In her enthusiasm Miss Chatley made a vigorous, and, we think, richly deserved, attack upon modern stage managers. "Perhaps," she said, "some managers think of scenery as a branch of mechanics and prefer their scenery to be utterly commonplace, and, not being content with their own debased personal tastes, they make a noisy parade of their convictions, thinking that the unfortunate public likes it that way." Not content with merely destructive criticism, however, the lecturer described some of the progressive influences that are making themselves felt on the stage in Europe and America. Amongst other things she pointed out that many are clamouring for the elimination of painted scenery and decoration; but expressed the doubt whether the tradition of such settings would lightly be discarded. She also suggested that settings and costumes should be designed by the same artist, who should be trained to the task.

Commencing on February 1 the International Arts Theatre Studio is holding an Exhibition of costume plates by Miss Chatley, some ninety drawings or designs being included. Bold in conception and original in design these have attracted much attention, not only amongst those interested in theatricals, but also amongst local artists. Costumes for plays of all periods from the early Greeks to modern times were shown, as well as for harlequinades, ballets and the like.

It is to be hoped that Miss Chatley's will not prove to be "a voice crying in the wilderness," for the local amateur stage could certainly stand a considerable amount of improvement along the lines suggested.

A. de C. S.

THE LIBRARY

The Shanphai Public Library's Programme: More and more is the Public Library of the International Settlement becoming the useful institution

it should be for such a large city as Shanghai. In an announcement issued recently by the Library Committee it is stated that twenty per cent. of the total

budget of \$4,000 for 1936 will be devoted to the purchase of new Chinese books, while it has been decided that a ratio of two works of fiction to one of non-fiction shall be substituted for the old ruling of three fiction to one non-fiction work in the purchase of books in the English language. It is also the aim of the Committee to give Chinese subscribers books which can be used in modern studies and research work. By these means this should in time become a very valuable Reference Library, supplementing the Library of the Royal Asiatic Society at 20 Museum Road, which is devoted more to books on China and the Far East. We take it that the Shanghai Municipal Council's Public Library, situated on Nanking Road, in its non-fictional section covers all branches of learning and all countries.

Statistics issued towards the end of January show that during 1935 there were 603 subscribers to the Library, of which 74 were Chinese. Some 12,932 non-fiction, 57,858 fiction, 823 children's books and 52 Chinese books, a total of 71,665 books, had been issued. There was an increase in circulation of non-fiction books of 1,190 over the figure for 1934. Twenty-one periodicals were added to the Library.

Valuable Tibetan Manuscripts

Secured: On January 17 the Italian explorer Doctor Giuseppe Tucci, speaking at the Italian Academy in Rome, described his expedition through Tibet made two years ago with Captain E. Ghersi, when a considerable number of ancient Tibetan manuscripts, many of them extremely valuable, were secured. In the book written by the two explorers entitled "Secrets of Tibet," translated by Miss Mary A. Johnstone, the authors state that they found many magnificent documents recording a vanished faith and prosperity piled up in corners of desecrated temples, in the recesses of *chortens*, or in holes in the caves of troglodites. In one temple at a place called Shang amongst other books heaped together they

found a complete "Kanghuir" written on large and beautiful sheets with red margins in magnificent characters in the ancient spelling. The authors found it "not difficult to convince the old custodian that to keep sacred objects with execrable carelessness is a much greater sin than to sell them to a person who will hold them in greater respect."

Valuable Library Destroyed:

A *Domei* message of January 24 describes the destruction by fire of the famous Library of the Kyoto Imperial University on that date. Priceless archives and documents were reduced to ashes as the fire swept the building, most of which was destroyed with its valuable contents. This constitutes an irreparable loss.

Nanking's Newspapers:

There are no fewer than twenty-six newspapers published in Nanking, with forty-three news agencies and 218 magazines, says a recent report in the *Shanghai Evening Post and Mercury*.

The Biggest Library in the World:

The National Library of Paris is claimed to be the biggest in the world, containing, as it does, five million volumes, not including duplicates, periodical, newspapers and documents. It has sixty miles of shelves. It has recently been announced that this great Library is to be completely modernized, a stupendous task which has already been partially accomplished.

Plans for a Japanese Library in

Shanghai: Plans are afoot for a library for the use of Japanese residents in Shanghai, to be put into effect as soon as Mr. Yaozo Sudo, a member of the Council of the Japanese Residents' Corporation and Chairman of its Library Committee, returns from Japan. The library is to be established temporarily in the basement of the assembly hall of the Central Primary Schools maintained by the Corporation.

REVIEWS

Dark Night and Other Poems, by A. W. Simms Lee: Allenson & Co., Ltd., London, 1935. Price 5s. net.

Whether the fact that he is living in Shanghai is sufficient to warrant Mr. A. W. Simms Lee being called the "Shanghai Poet" we cannot say, but his being a resident here certainly adds interest to

his book of poems, published recently in London. Probably the second half of the book, devoted to poems on China, will appeal most strongly to our readers, though the beauty of line and thought found on every page of the first part will also be appreciated. The poem which gives its name to the book, "Dark

Night of the Soul" presents the key to the rest with its poignant sadness. There is little joy in any of the poems, but mainly a regret at something that is lost. Thus in "Vain Spring,"

Starlings chatter and scream,
And willows fling their boughs
And the whole world, it would seem,
Is out on a wild carouse.

For the Spring has come again
With her revelries so dear;
But my heart lies crushed and slain
In the shroud of yesteryear.

The Hall of Lin Ku Ssu, Nanking:

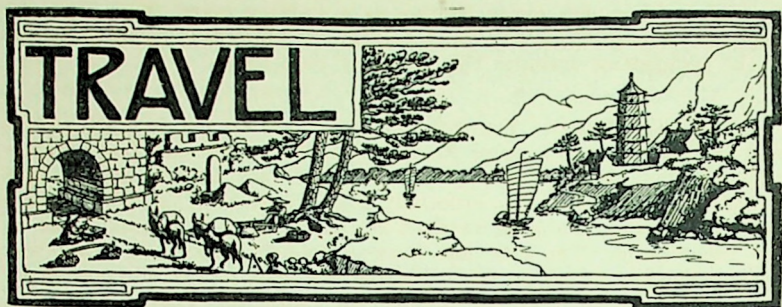
Under this title Mr. Johannes Prip-Møller, who spent some years investigating archaeological sites in China, has published in *Artes*, Tome III, pages 167 to 211, Copenhagen, 1935, an extremely interesting account of a building situated about four miles east of Nanking in the Tzu Chin Shan, or Purple Mountain, which was formerly believed to be part of a monastery called Lin Ku Ssu and built in the reign of Hung Wu or T'ai Tsu (1368-1398 A. D.), the founder of the Ming Dynasty, but which the author proves very conclusively was built in the Yuan or Mongol Dynasty (1206-1341 A.D.) as a church by Franciscan missionaries, who were sent out from Avignon during that dynasty and busied themselves founding churches and building monasteries in the provinces in the region of the Lower Yangtze. The building in question is known as the Wu Liang Tien of Lin Ku Ssu, and consists of an immense hall altogether unlike any purely Chinese building and constructed entirely of bricks of a type used in the Yuan Dynasty, even to the vaulting and arches. When examined by Mr. Prip-Møller during the months of August and September, 1929, the building was roofless and lay undisturbed under a blanket of vegetation. In 1932 it was

taken into the park surrounding the mausoleum of Sun Yat Sen, and restored to form a ceremonial hall. The excellent pictures and diagrams illustrating the article were made before the restoration, so that they preserve, as far as was then possible, the original features of the building.

The historical records of the Lin Ku Ssu tell of the removal of this monastery under Hung Wu's instructions from its former site to the present one, and from them it may be gathered that the Wu Liang Tien was restored at that time. The conclusions as to the date of this remarkable building arrived at by the author were based upon a careful investigation of its features, and leave little room for argument or doubt. This is a fine piece of work, adding, as it does, an interesting chapter to the vast subject of the archaeological remains to be found in China and what they reveal of the history of this country.

A word may be said concerning the publication in which Mr. Prip-Møller's article appears. This is "*Artes, Monuments et Memoires publies sous la Direction de Vilhelm Wanscher*," to give it its full title. Vilhelm Wanscher is Professor of History and Art in the Royal Academy of Fine Arts of Copenhagen, Denmark, and the book is published by P. Haase & Fils of that city. In Tome III, it contains, besides Mr. Prip-Møller's contribution, the following articles "Principles of Great Art and Religion in Antiquity" by Vilhelm Wanscher, and "Das Alte Rat und Gerichtshaus in Copenhagen Erbaut von C. F. Hansen" by Jorn Rubow. The former is well illustrated with reproductions of drawings, photographs and paintings (in colour), and covers a period from the Stone Age through Egyptian down to early Greek and Roman times. The volume is handsomely bound and well printed on the best paper.

A. de C. S.



THE SACRED MOUNTAINS OF CHINA SUNG SHAN, THE DESERTED

BY

J. HERS

The sacred mountains known as Sung Shan is situated in the Teng-feng district, south-east of Lo-yang in Honan Province. It includes two different peaks, namely, Sung Shan proper (嵩山), which in the old books is called T'ai Shih (太室), and the Yü Tai Shan (玉帶山), which in the books is called the Shao Shih (少室).

The Yü Tai Shan is situated to the west of the Sung Shan proper, the road that goes from Lo-yang to Teng-feng, running between the two peaks.

The height of both peaks is about 5,000 feet.

Seen at a distance, the Yü Tai Shan looks like a square mass of rock with vertical walls, and a flat top; while the Sung Shan proper shows a round head. A good view of both is obtained from the railway line, between Hei-shih-kuan Station and Yen-shih-hsien Station.

Among the five sacred mountains of China the Sung Shan is classified as the central one.

From very remote times the Sung Shan has been the object of a cult. This cult was especially active during the Han period. Several Emperors made the ascent of the mountain to offer sacrifices on its summit. The famous Empress Wu Hou also made the ascent.

At the present time pilgrims no longer ascend the Sung Shan, both peaks are absolutely deserted except by shepherds and woodcutters. But at the foot of the hills, many magnificent vestiges of the past may still be seen, and probably no other region in China is richer than this one in historical sites and monuments.

The number of tourists visiting the Sung Shan is now very small; nothing has been done to attract them. The trip offers no special difficulty, but it takes time.

THE SACRED MOUNTAINS OF CHINA

Taking Yen-shih Hsien Station as a starting point, three days are required to reach all that is worth seeing, two more days being necessary if the programme includes the ascent of both peaks.

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YEN-SHIH HSIEN. Yen-shih Hsien Station on the Lung-Hai Railway is situated at Kilometer 91, between Cheng-chou and Lo-yang, Lo-yang Station being at Kilometer 120. It is not always easy to hire animals at Yen-shih Hsien, especially since the summer of 1935, because the whole valley has been ravaged by floods, with enormous losses to the inhabitants. The city has been completely destroyed. This was sure to happen sooner or later, because the level of the city was much lower than the level of the country all round it. Previously it had been protected against floods by its walls, with the result that the level was still the same as it was two thousand years ago, while the country outside the walls has been slowly raising, due to deposition by flood waters. The same thing has happened at Kung Hsien, Tai-yüan Fu, and many other places in the loess region. I am told that the Yen-shih Hsien city is now to be rebuilt on higher ground, between the railway line and the hills. In normal circumstances, however, and with the assistance of the station master, it should not be impossible to find a mule or a horse for oneself, with coolies to carry one's luggage.

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T'ANG GRAVES (唐墓). Soon after leaving Yen-shih Hsien Station the Lo River is crossed by ferry-boat. During the first hour's journey the road proceeds across the plain, which is perfectly flat. Then it slowly goes up through deep loess ravines finally to reach a vast plateau, where two tumuli of considerable size may be seen. The nearest is the one of a prince of the T'ang Dynasty, who died in 675 A.D. All the other graves of the T'ang Imperial family were desecrated and destroyed soon after that dynasty had disappeared. This particular grave, however, was saved, because the prince in question had never ascended the throne.

Not far from his tumulus there is a magnificent stone lion, erect, like the lion of Waterloo; also a tablet bearing a date equivalent to 690 A.D.

Soon after leaving this spot the village of Futien is reached, and then the pass of Hao Ling. As soon as this has been crossed the road turns to the right to reach the famous Shao Lin Monastery. The distance between Yen-shih Hsien Station and Shao Lin Ssu is seventy *li*, or about twenty-three miles.

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SHAO LIN SSU (少林寺). The Shao Lin Monastery was founded in 477 A.D. by Emperor Hsiao Wen Ti, of the Northern Wei Dynasty. Later on it was richly endowed by Prince Tsing Wang, as a token of gratitude for the assistance given by the monks in the course of a campaign. This Prince Tsing Wang was to become the Emperor T'ai Tsung, second of the T'ang Dynasty.

During the first two centuries many Indian monks used to live at Shao Lin Ssu. The memory of these dark skinned monks is preserved in several frescoes in a side hall.

The Shao Lin Ssu monks were also famous for their special method of boxing. Of this, however, nothing apparently remains.

Under the entrance hall two very interesting stone tablets are preserved. One comes from the Wei period and bears the date of the 11th Day of the 4th Moon of the 2nd Year of T'ien P'ing (535 A.D.). The date of the other one corresponds to 570 A.D.

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BODHIDHARMA'S CAVE (達摩洞). Bodhidharma was an Indian Prince, who took holy orders, became a monk and finally left his native land for China, when he was already well advanced in years. He landed in Canton in 520 A.D., went to Kien-kang (the present Nanking) and thence to Lo-yang and the Shao Lin Ssu. He did not die at Shao Lin Ssu, however, but near the Hsiung Erh Shan, a mountain situated in Western Honan close to the Shensi border and south of what is now the city of Lu-shih.

He has been presented as the 28th and last of the Buddhist Patriarchs in India and the first Buddhist Patriarch in China, but there is hardly a point regarding Bodhidharma which has not given rise to controversies. The date of his arrival, the date of his death, the places he visited, the reasons for his going to Lo-yang, the part he took in the creation of the famous Chen or Zen sect (禪) of Buddhism and the extent of his influence have all been the subject of disputes.

Behind Shao Lin Ssu there is a cave where Bodhidharma is said to have spent nine years in meditation. It is called Ta-ma-tung. The ascent to it takes some time because the pathway goes through shrubs and thorns. The cave is kept clean, but does not seem to receive any further attention. From the cave one may enjoy a splendid view over the northern slopes of the Yü Tai Shan. In the temple itself a little block of red sandstone is shown to visitors as being the one upon which Bodhidharma used to keep his eyes fixed.

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YÜ TAI SHAN (玉帶山) or SHAO SHIH (少室). The road to the top of Yü Tai Shan starts at Shao Lin Ssu and is very interesting to geologists and botanists. Halfway is a small temple, Erh Tsu An or the Second Patriarch's Monastery, with a splendid specimen of the Chinese juniper (*Juniperus sinensis*) growing in its grounds. The southern face of Yü Tai Shan is very steep, nearly vertical. Neither monuments nor ruins occur at the top. The trip takes seven hours.

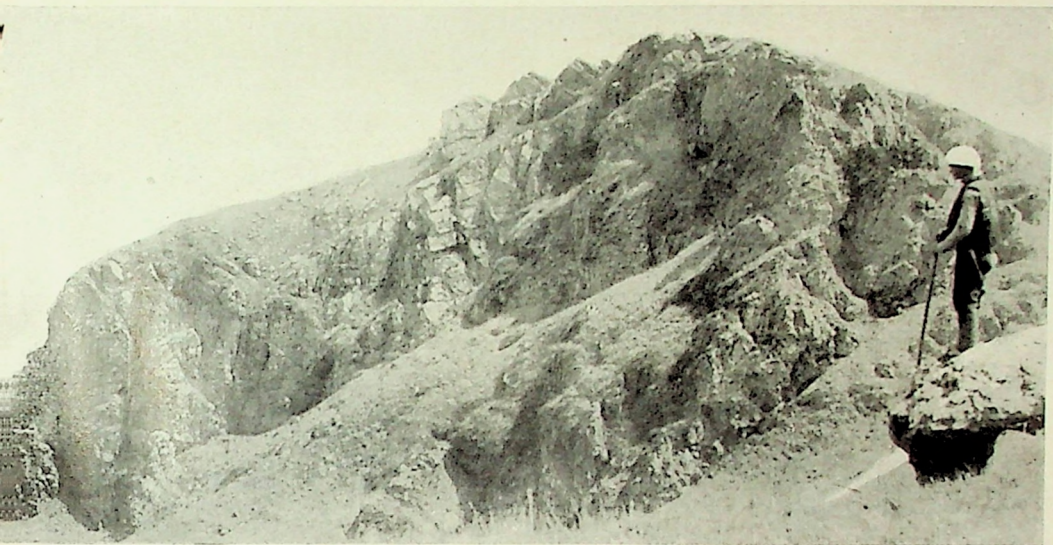
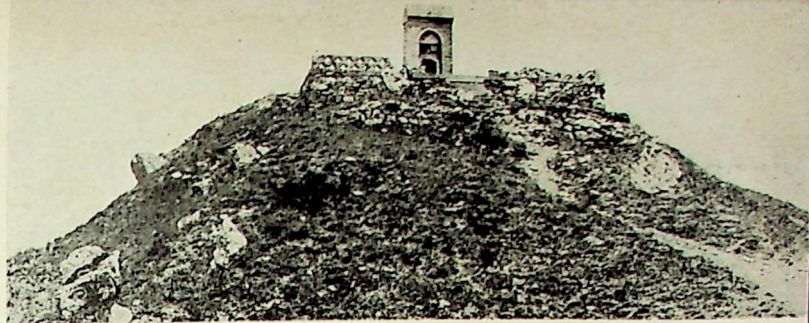
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THE SHAO SHIH PILLARS (少室闕). From Shao Lin Ssu one goes to Sung Yang Kuan, seven li north of Teng-feng City. The Sung Yang Kuan temple and the Shao Lin Ssu are the only two places offering passable or even tolerable accommodation; so it is advisable to take them as starting points for all excursions.

Many things may be seen between Shao Lin Ssu and Sung Yang Kuan. The first is a pair of stone pillars of the Han period. These

THE SACRED MOUNTAIN OF SONG SHAN.

A small Shrine is perched on the Summit of Song Shan

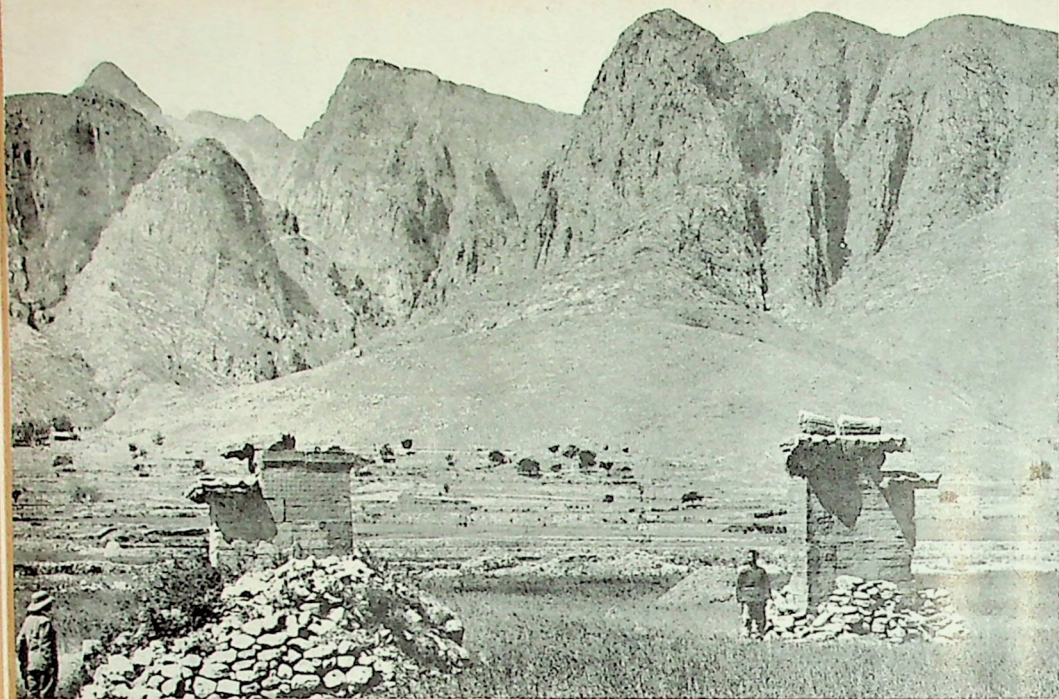


Yu Tai Shan looks like a square Mass of Rock with vertical Walls and a flat Top, while Song Shan proper shows a round Head.



Photographs by
J. Hers.





Yu Tai Shan and the two Shao Shih Pillars.



The Main Hall of the Huei Shan Ssu. Photographs by J. Hers.



The Cemetery at Shao Lin Ssu.



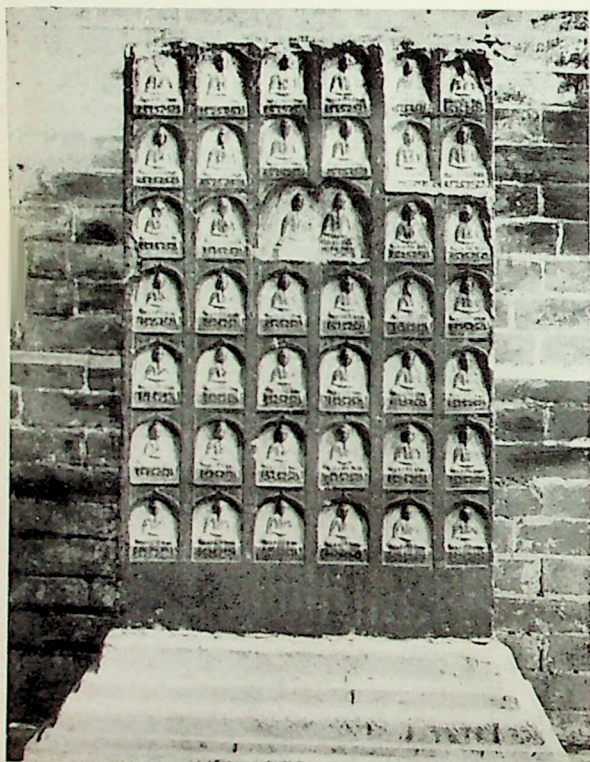
Mural Painting at Shao Lin Ssu showing Indian Monks. Photographs by J. Hers.



The Shao Lin Ssu looking toward Yu Tai Shan



On the Right is a carved Stone Tablet at the Shao Lin Ssu bearing the Date A. D. 570. Note the two realistic Lions at the Bottom.



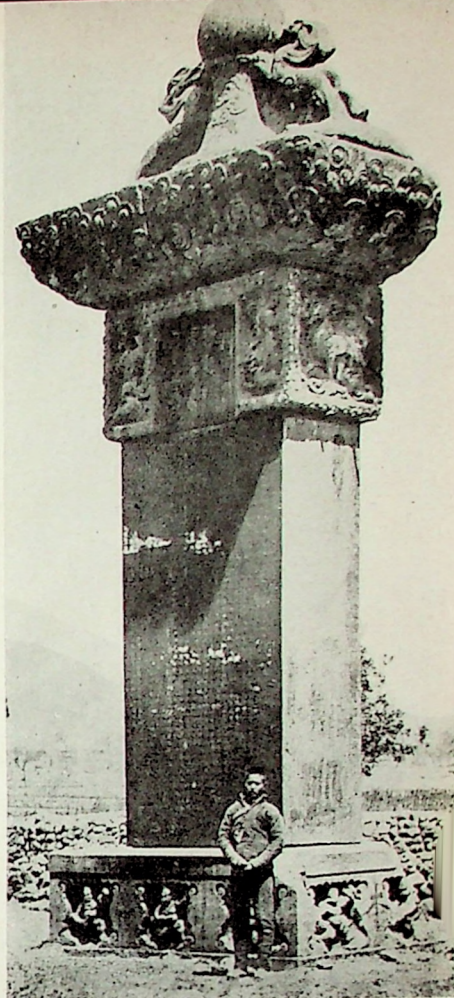
A Stone Tablet of the Wei Period (A. D. 535) at the Shao Lin Ssu showing the characteristic Multiplication of the Buddha.



The Cave of Bodhidharma at the Shao Lin Ssu, in which the Indian Monk is supposed to have spent his last Nine Years.



A large Stone Lion near a Grave of the T'ang Period near Yen-shih Hsien in Honan. Note the Tip of the Horn at the Top of the Head.



Above is a Stone Tablet of the T'ang Period near the Sung Yang Kuan, Honan.



On the Left is the famous Rock of Ki's Mother in the Teng - feng District, Honan.



Photographs by J. Hers.





The Pagoda at Fa Wang Ssu to the North of the Road from the Shao Lin Ssu to the Sung Yang Kang in Honan. The Monastery was first built in 61 A. D.



Photograph by J. Hers.





The Pagoda and Ruins of the Sung Yo Ssu, a once famous Monastery
founded in 509 A. D. It is not far from the Fa Wang Ssu.



Photograph by J. Hers.





Above is One of the Three mighty Thuya Trees (*Thuja orientalis*) to which the Han Emperor Wu Ti (B. C. 140-87) gave the Name of Generals. Its Girth is 38 Feet at the Base. To the Left is a fine Specimen of the Silver Bark Pine (*Pinus bungeanas*) which stands in the Courtyard of the Sung Yang Kuan near Teng-feng, Honan.



Photographs by J. Hers.



were apparently decorating the entrance to a temple situated to the south-east of Yü Tai Shan. They are called the Shao Shih Pillars and will be found some two hundred feet south of the road. From this place to the village of Hsing-kia-pu (邢家鋪) is three *li*, to Teng-feng city it is thirteen *li*.

The famous French sinologue, E. Chavannes, has written extensively about these pillars and two other pairs situated further east. (See "La Sculpture à l'époque des Han; Mission Archéologique dans la Chine septentrionale;" Paris, 1913).

From the fact that the T'ai Shih Pillars (see below) were dedicated to the cult of the Central Peak, or T'ai Shih, it might be inferred that the Shao Shih temple was dedicated to the Shao Shih deity, but Chavannes has his doubts about this. He remarks that T'ai Shih and Shao Shih simply mean large room and small room, and that these terms did probably apply to the stone pavilions (not large temples) which were behind the pillars. So it is possible that the two peaks took their names from these pillars and pavilions, instead of the pillars taking their names from the peaks.

There is nothing to prove, anyhow, that the Shao Shih Pillars were dedicated to the Shao Shih Peak. Some Chinese records tend to show that they were dedicated to the Goddess Shao I (少姨), sister of Ki's mother (see below).

The pillars bear a list of donors, who were the same as those whose names appear on the Ki Pillars. They may, therefore, be attributed to the same date, 123 A.D.

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HUEI SHAN SSU (會善寺). A little further on and to the north of the road will be found the Huei Shan Monastery. Originally this was a summer residence of Emperor Hsiao Wên Ti, but at the end of the sixth century the palace was turned into a monastery under the name of Huei Shan Ssu. The main hall and a few minor buildings are still in a tolerably good condition.

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THE ROCK OF KI'S MOTHER (啓母石). As the great Emperor Yü was engaged in what we call to-day flood relief and river conservancy he had to proceed one day from what is now the Yen-shih district to what is now the Teng-feng district. In order to proceed more quickly he took on the form of a bear. But previously he had said to his wife "I want you to bring me food; as soon as you hear my drum, you come." As he was jumping over a stone, he inadvertently struck his drum, whereupon his wife rushed up with the food, but, seeing the bear, she felt ashamed and ran away. She ran until she came to the foot of the Sung Shan, but there she was transformed into a rock. As he knew that she was pregnant Yü said to her "Give me my son." At this the rock split and the child came out.

So runs the story that a commentator, Yen Shih Kao, (顏師古), 579-645 A.D., says he found in the works of the famous writer Liu An (劉安), commonly known as Huai Nan-tze (淮南子), who lived in the twelfth century. "Tradition says that Liu An positively discovered

the elixir of immortality and that after drinking of it he rose up to heaven in broad daylight; also that he dropped the vessel that had contained this elixir into his court-yard, and that his dogs and poultry sipped up the dregs and immediately sailed up to heaven after him." (Giles' Biographical Dictionary).

Whatever may have happened to Yü's wife, the son became the second Emperor of the Hsia Dynasty, under the name of Ki (啓). The Ki character, however, became taboo during the Han Dynasty, because it was the personal name of Emperor King (B.C. 156-141) and Ki was replaced by K'ai (開).

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THE TWO PILLARS OF KI'S MOTHER (啓母闕). The rock is still to be seen ten *li* north of Teng-feng. Near by there are two pillars bearing the date of the second year of Yen Kuang (123 A.D.). The character used on these pillars is K'ai, and not Ki, because the pillars were built after the interpolation of characters had taken place.

These pillars are extremely interesting, because they are authentic specimens of Chinese sculpture of the Han period; also because they bear *chuan* (篆), or lesser seal style characters, such as were written during the later part of the Han period, just after the reform introduced by Hsü Shen (許慎) in his Shuo Wen.

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HUNG FU KUNG (洪福宮). Very near the pillars of Ki's mother, there is a Taoist temple which used to be called Chung Fu Kung (崇福宮) and is now called Hung Fu Kung. This temple probably, but not certainly, covers the site where the Wan Sui Kung (萬歲宮) was built to commemorate Emperor Wu's visit (110 B.C.). As the Emperor had just finished offering the ritual sacrifices a voice was heard three times saying "Wan Sui," Ten Thousand Years. The voice was taken as being the sacred mountain's own voice.

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FA WANG SSU (法王寺). This is another very interesting place to the north of the road between Shao Lin Ssu and Sung Yang Kuan. The original buildings were erected during the fourth year of Yung P'ing (61 A.D.), but they were replaced several times by other buildings under other names and for different uses. At the present time it is a Buddhist monastery, with a really splendid four-sided pagoda of fifteen stories.

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SUNG YO SSU (嵩嶽寺). Not far from Fa Wang Ssu will be found the ruins of another monastery, which was at one time very famous. This is the Sung Yo Ssu, founded in 509 A.D. The famous Empress Wu Hou of the T'ang Dynasty stayed here when she came to visit the Sung Shan.

Aesthetically speaking, the Sung Yo Ssu pagoda is probably the most beautiful of all the pagodas in China. Its lines and contour are perfect. The dilapidated condition of all these Buddhist monasteries reminds us, however, of the fact that Buddhism has almost entirely disappeared from Honan. This province is the one where Buddhism was

THE SACRED MOUNTAINS OF CHINA

first officially recognized, where so many millions of people were converted to the new faith, where so many thousands of temples and monasteries were built, where Buddhist art produced such marvels as the Lung Men sculptures; but the cult of Buddha and Amida has now practically disappeared from Honan. Very few monks are to be seen and in almost every temple the Buddhist statues have been replaced by those of Kuan Ti and his assistants.

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SUNG YANG KUAN (嵩陽觀). Sung Yuang Kuan is an old taoist temple, seven *li* north of Teng-feng city. It has now been converted into a school. In the garden is a fine specimen of *Pinus bungeana*, the silver bark pine.

This pine, however, is not to be found wild in the Sung Shan range, its habitat lying further west on the Honan-Shensi border I have seen thousands of trees of this species in the Lu-shih district, growing on shales at an average altitude of 300 feet.

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THE THREE GENERALS (三將軍). This is the name given by Emperor Wu Ti (140-87 B.C.) to three thuya trees (*Thuja orientalis*) which were already famous at that time, and which may still be seen in front of the Sung Yang Kuan.

All around the trees many stone tablets and images may be seen celebrating the antiquity and merits of the three giants.

One of these trees is apparently genuine. It has a circumference of thirty-eight feet at the base. The other two are much smaller, and are "substitutes" which were planted at a later date to take the place of two dead ones.

I would say the same thing of the Chou thuya (周柏) which is shown to tourists at Chin Ssu, near Tai-yuan Fu, which is much too healthy to be a tree of the Chou period.

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T'ANG STONE STELE (唐碑). Near the Sung Yang Kuan a magnificent specimen of T'ang art is to be found in the form of a stone stele or tablet more than twenty feet in height. It is the finest and most famous thing of its kind in China, and is celebrated for the beauty of the writing upon it.

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SUNG SHAN (嵩山). The ascent of the Sung Shan proper may be undertaken from Sung Yang Kuan. There is a short cut for wood cutters which is very rough and necessitates climbing on hands and knees in more than one place, but is much shorter than the official road. There is nothing to be seen at the summit except a stone tablet with undecipherable characters.

It seems that there never was any temple at the top of Sung Shan, only an altar for open air sacrifices.

On the way down it is best to take the official road leading straight down to Chung Yo Miao.

CHUNG YO MIAO (中嶽廟). This must at one time have been a very large and important temple. It was built over two thousand years ago and dedicated to the cult of the Central Peak. Under the Han, the name was T'ai Shih Miao. Rebuilt during the first year T'ai Yen (435 A.D.), it was again rebuilt during the Kai Yuan period (733-7841 A.D.). Of vast proportions and with yellow roof tiles it must have been one of the best in China. Not much now remains, however, except the many inscriptions recording Imperial visits together with four enormous iron statues and a number of thuya trees, said to date from the Han period.

In every famous centre in North China similar trees may be found; Han Pai and T'ang Kuai, or thuyas from the Han period and sophoras from the T'ang period. In many cases, however, the *pai* is not a thuya but a juniper.

Every year in the spring a great fair is still held at the Chung Yo Miao, attracting thousands of visitors.

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T'AI SHIH PILLARS (太室闕). These two pillars are situated a little to the south of Chung Yo Miao. Apparently they marked the entrance, not to Chung Yo Miao, but to a smaller temple. Dedicated to the cult of the Central Peak, they were donated by the Yang Ch'eng district magistrate and are dated 118 A.D.

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TENG-FENG CITY (登封). Situated seven *li* south of Sung Yang Kuan and eight *li* west of Chung Yo Miao, Teng-feng is a very poor city. There is nothing to be seen there.

The present name of Teng-feng comes from the sacrifice (*Feng*) which Empress Wu Hou offered when she ascended (*Teng*) the Sung Shan.

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To be complete this article should include a more detailed description of all the monuments referred to, a list of all the very many minor points of interest which have not even been mentioned and a list of all the main books written by Chinese scholars at different periods about the Sung Shan. But these few pages would then run into as many volumes. It must be stated, however, that within no great distance of the Sung Shan are many other places worth a visit. Amongst them are the Lung Men Caves, south of Lo-yang, the grave of Kuan Ti, half way between Lo-yang and Lung Mên, the White Horse Monastery, recording the arrival of the first Buddhist missionaries officially admitted to China, and the Sung Dynasty graves in the Kung Hsien district.

But to visit all these places it is better to return to Yen-shih Hsien and to go by railway either to Lo-yang or to Hei-shih-kuan or Kung Hsien, from which stations they may be reached in a few hours.

TRAVEL AND EXPLORATION NOTES

Exploration in Tibet: For long known as the forbidden land, Tibet is at last yielding up her secrets to the persistent onslaughts of explorers, as expedition after expedition in recent years has penetrated its mountain fastnesses and barren uplands. Last month saw the winding up of the Second Brooke Dolan Expedition into Eastern Tibet, when the leader, Mr. Brooke Dolan II of Philadelphia, and his companions, Mr. Ernst Schafer, chief zoologist, and Mr. Marion Duncan, manager and interpreter, left Shanghai for America. The First Brooke Dolan Expedition was carried out in 1931, when Mr. Schafer succeeded in shooting a specimen of the rare giant panda, and when splendid series of other rare animals, such as takins, golden monkeys, serows and various kinds of deer, as well as a large collection of birds, were secured and sent back to the Natural History Museum of the Philadelphia Academy of Sciences under whose auspices the expedition was carried out. On the second expedition, which took place in 1934-5, the members covered a very much wider range of territory, Mr. Dolan making a long trek through a practically unknown region along the great mountain range called the Anne Machin, working from Jerkundo in Eastern Tibet to Sung-pan-ting in North-western Szechuan, and Mr. Schafer reaching Central Tibet, two weeks' journey from Lhasa, after having skirted the famous Tsaidam Marsh, reaching the actual source of the Yangtze and returning down the extreme upper course of the Yellow River. In the course of his travels he secured fine series of wild yak (*Bos grunniens*), wild or big-horn sheep (*Ovis mongolica*), Thorold's deer (*Cervus albrostris*), Macneill's deer (*Cervus macneilli*), previously only known from the skin of a female, the antlers of the male being quite unknown, the Szechuan sambar (*Rusa unicolor dejeani*), the Szechuan takin (*Budorcas tibetana*), the white-maned serow (*Nemorhaedus milne-edwardsi*), the goral (*Urotragus griseus*), the blue sheep (*Pseudois nahoor szechuanensis*), the lesser blue sheep (*Pseudois nahoor subsp.*), an altogether new form found in an isolated area in the upper gorge of the Yangtze, the roe deer (*Capreolus bedfordi*, or possibly *tianschanicus*), the tufted deer (*Elaphodus cephalophus*), the

muskdeer (*Moschus sifanicus*), the goat or Tibetan gazelle (*Gazella pecticaudata*), the chiru or Tibetan antelope (*Pantholops hodgsoni*), the Tibetan grizzly (*Spelaesus lagomyiarius*), the wolf (*Canis lupus laniger*), the corsac or steppe fox (*Vulpes corsac*), the common fox (*Vulpes waddelli*), the isabelline lynx (*Lynx issabelinus*), the Tibetan macaque (*Macacus tibetanus*), and a large number of smaller quadrupeds, including hares, pikas or rock hares, many species of voles, rats and shrews. Altogether 150 skins (with skulls) of large mammals were shipped to America, as well as upwards of 3,000 bird skins, the latter collection containing many new species. It is safe to say that never before has any part of Tibet been so thoroughly explored zoologically as has been the area covered by this expedition. A remarkably fine series of photographs including hundreds of rolls of films and covering the terrain passed through, the people encountered, the towns and monasteries visited and the fauna and flora of the whole region was secured. Some of these were shown as lantern slides at lectures delivered in Shanghai by Mr. Dolan and Mr. Schafer.

Turning to another phase of exploration in Tibet we have the account of Dr. Giuseppe Tucci's recent expedition into Western Tibet, delivered not long ago in a report before the Italian Royal Academy in Rome. Dr. Tucci's expedition was mainly archaeological, historical and religious, numerous monasteries and lamaseries having been visited during its course, and many valuable documents and much information secured.

Then there is the new attempt to be made to scale Mount Everest by members of the 1936 Mount Everest Expedition headed by Mr. Hugh Ruttledge, which has already left England for its base at Kalimpong. It is expected to start from this point on March 20. The French also have organized an expedition into the Himalayas, under the auspices of the French Alpine Club and headed by Jean Escarre, a noted Alpinist. The members will attempt to reach the summit of Hidden Peak in the Karakorum Range.

Finally, there is the expedition carried out through the Nosu country three years ago by Dr. J. L. Maxwell of the Henry Lester Institute of Medical Research, Shanghai, which was described recently

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in a lecture in Cathedral Hall. Special attention appears to have been given to medical matters and health conditions amongst the tribesmen visited.

Soviet Explorations in the Arctic:

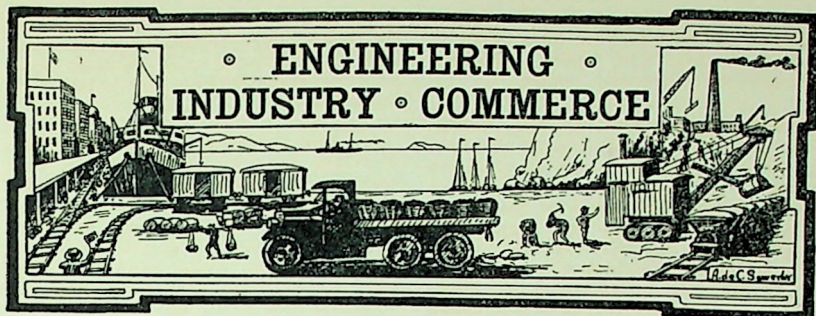
With the avowed intention of discovering an open steamer route from North Russia to the Far East, at least during summer months, explorers of the Soviet Government have been busy during the past few years in Arctic regions, it seems with considerable success. The feasibility of the route from Murmansk to Vladivostok has been proved beyond a doubt, and steamers will hereafter ply regularly through the Arctic Sea from June to September every year between these and intermediate ports. Last summer four steamers traversed the full route, two leaving Vladivostok toward the end of June and reaching Murmansk by the middle of September, and two leaving Murmansk in July and reaching Vladivostok in September. Sixty-eight other steamers plied regularly between the eastern and western coasts of Soviet

Russia and the mouths of the Yenesei and Ob Rivers. New islands were discovered and charted and much valuable data, scientific and otherwise, was gathered by the explorers.

Sir Eric Teichman delayed in Gilgit:

The last news to reach Shanghai concerning Sir Eric Teichman was dated January 15 and was to the effect that his arrival in Delhi had been prevented by severe weather. A special message to the *North-China Daily News* from that city stated that the aeroplane, the Viceroy's own Avro, left Rawalpindi for Gilgit on January 14, but was forced to return without completing its flight because ice formed on its wings. It was to make another attempt to reach Gilgit on January 15.

Sir Eric Teichman, it will be remembered, left Peiping towards the end of last summer proceeding overland by motor car to India by way of Chinese Turkestan, finally reaching Gilgit on January 8 after a somewhat adventurous journey.



HUNTING GOLD WITH ELECTRICITY

BY

ERIK T. NYSTROM

The ancient art of prospecting for treasures hidden underground has always stirred the imagination of mankind, and many tales of romance, adventure, greed and crime have been woven round it. There is, and always will be, much uncertainty attached to prospecting for minerals, for Mother Earth does not willingly give up her secrets. But science has progressed in this direction as elsewhere, and we now possess wonderful new methods of prospecting by geophysical methods, whereby great areas may be examined with cost and labour tens of times less than before, and hundreds of new mineral deposits have been added to the resources of mankind.

In 1930 the World Conference of Geophysicists, which met at Stockholm, was invited by the Swedish Government to visit the newly discovered Boliden gold field, and the members, of which the author was one, were asked to attend a demonstration *in situ* of the electrical prospecting methods by which this important mineral deposit had been discovered. We could all listen in on the telephone and "hear" the great ore-body, hidden below its thick overburden of soil. When Boliden was discovered there was not a fragment of mineral in sight, and the covering of sand and clay was 60 ft. thick. Amongst other prominent scientists from all over the world both the Director General of the British Geological Survey, Sir John Flett, and the chief of the Swedish Geological Survey, Dr. Axel Gavelin, were present.

Geophysical prospecting methods may be classified as follows:

1. Magnetic methods, using the Miner's Compass or the Magnetic Balance.
2. The Gravity method, using the Torsion Balance.
3. Electrical methods, using galvanic current introduced into the soil or inductive methods.
4. The Radio-Active method, measuring radium emanation from fault-fissures.

MAGNETIC METHODS

The practical application of geophysics for ore prospecting originated in connection with the keen search for metals during the World War, but long before that we possessed a remarkably simple but efficient instrument for finding magnetic bodies hidden underneath the soil. The Miner's Compass, invented in Sweden nearly two hundred and fifty years ago, can swing vertically as well as horizontally and indicates by its abnormal dip that there is a "pull" greater than that originating in the ordinary terrestrial magnetism. In this way many important deposits of magnetite (magnetic iron ore) have been found in Sweden and elsewhere. This simple instrument is still in use, but has been improved and we have now large and complicated—and, let us add, delicate and expensive—magnetic instruments, called magnetic balances

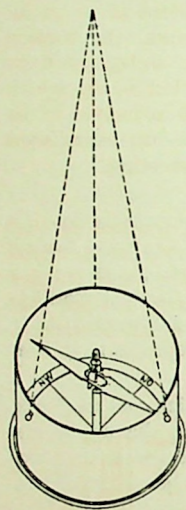


Figure 1. The Miner's Compass.

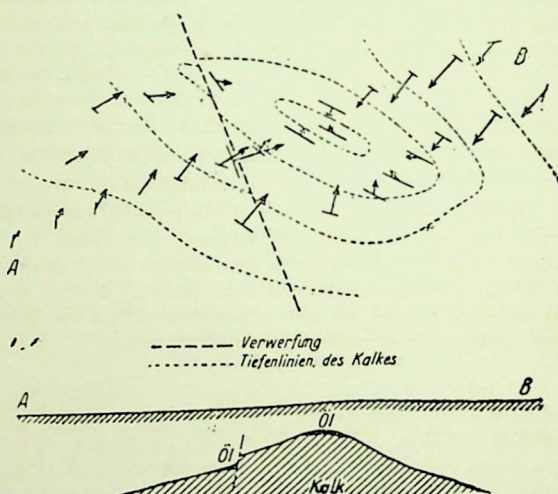


Figure 2. Example of Torsion Balance Diagram.

or theodolites, which are so sensitive that they can detect the different magnetic properties even of ordinary rocks, such as sediments, granite and basic intrusives.

THE GRAVITY METHOD USING THE TORSION BALANCE

It was known long ago that the force of gravity, which makes any object released fall to the ground, is quite different in different parts of the world. It was known that the pendulum swings faster on an island in the Pacific than amongst the mountains of Europe, the specific gravity of the former region being about 3.1 as compared with 2.7 in Europe. There may be, of course, also local discrepancies from normal gravity, and these are often caused by bodies of mineral or salt, either of much greater or smaller specific gravity than the normal.

HUNTING GOLD WITH ELECTRICITY

The torsion balance, discovered by Cavendish and improved by the Hungarian Baron R. von Eötvös, consists of a small and light beam suspended in the middle by a very fine wire and carrying at either end a small weight made of metal. The swing of the beam is influenced by the gravity force, and we can thus observe if this is sub-normal or super-normal and plot the amounts on a map.

There are certain drawbacks to torsion balance work, since neighbouring mountains may exert super-normal effects, and the instrument is highly delicate and the readings take an abnormally long time; but there is no doubt about its success, especially in locating the so called salt-domes or salt-plugs (of low specific gravity), which have their value as indicators of petroleum which often accumulates around the circumference of these bodies. Especially in the southern part of the United States of America, in the Gulf states, where there is no geological indication and the country is flat and featureless, the torsion balance has achieved veritable triumphs. Thirty-nine salt-plugs were discovered in Texas and seven in Louisiana, besides ten more, which were found in collaboration with seismic parties (the principle to be described below). It is clear that the torsion balance has established itself as an important instrument in geophysical prospecting.

THE SEISMIC METHOD

Seismology, the science dealing with earthquakes, teaches us that when the earth's crust is strongly disturbed by natural or artificial causes, waves proceed from the locality of impulse in the same manner as when a stone is thrown into water. But it was early noticed that the seismic waves do not proceed at the same speed in all directions. For instance the waves proceed through

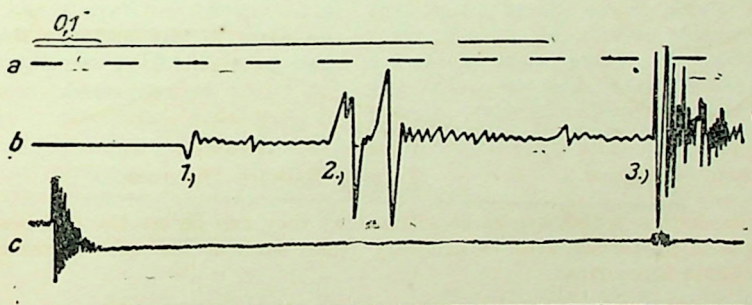


Figure 3. A Seismogram. *a* Time Marks; *b* Tremors indicated; *c* The Explosion indicated; 1 and 2 Arrival of the Seismic Waves; 3 Arrival of the Sound

Marble	at a rate of 5,300 to 6,600 metres per second
Granite	„ „ „ „ 4,100 „ 5,600 „ „ „
Rock Salt	„ „ „ „ 4,400 „ „ „
Sandstone	„ „ „ „ 2,100 „ 2,800 „ „ „

Thus, if we imagine a salt-plug enclosed in sandstone, it is clear that the speed of a seismic shock in the former substance will be greater than in the latter, and, if we produce an artificial earthquake by letting off a charge of dynamite in the ground and establish some means by which the speed of the resultant seismic waves can be measured, we may get some idea of the geological formations existing between the point of impulse and the measuring instrument. The latter takes the form of a Seismometer with a small mirror which is caused to flutter by the tremor and throws a beam of light into a kind of "movie" camera, the result being a diagram of tremors as illustrated in Figure 3. The greatest success has been achieved by so-called fan-blasting, the explosive being let off say six times and the receiving instrument moved each time along the circumference of a circle with a radius of two or three miles. If the tremors take an abnormally small time to traverse their path, we may suspect the presence of a salt-plug in between.

Seismic prospecting is expensive. A party of ten to fifteen men is required, including a lawyer to settle the claims of disgruntled farmers! But there is no doubt about the favourable results of seismic prospecting. In Texas alone forty-five salt-plugs were discovered by this method and each discovery is estimated to be worth from U.S.\$150,000 to U.S.\$500,000.

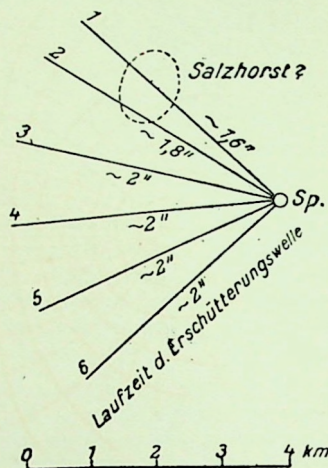


Figure 4. Fan Blasting. In Rays 3 to 6 the time is 4 Kilometres in 5 Seconds: in Rays 1 and 2 the Time is less and the Presence of a Salt Plug may therefore be suspected.

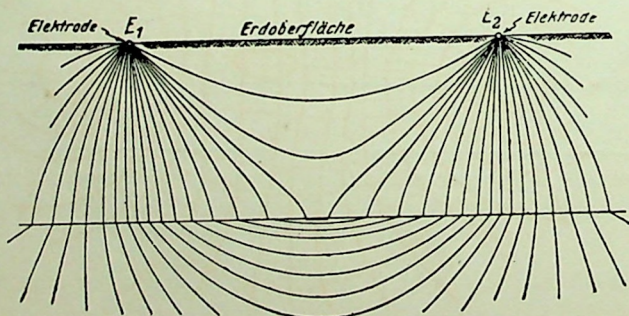


Figure 5. Showing the Distribution of the Electric Current in the Ground when two different Strata are present.

HUNTING GOLD WITH ELECTRICITY

ELECTRICAL PROSPECTING METHODS

It has long been known that as a rule the earth's crust can conduct electricity, and the proof is the existence of single-wire telegraph and telephone lines where the current comes back through the earth. But the conductivity varies a great deal, depending on the composition of

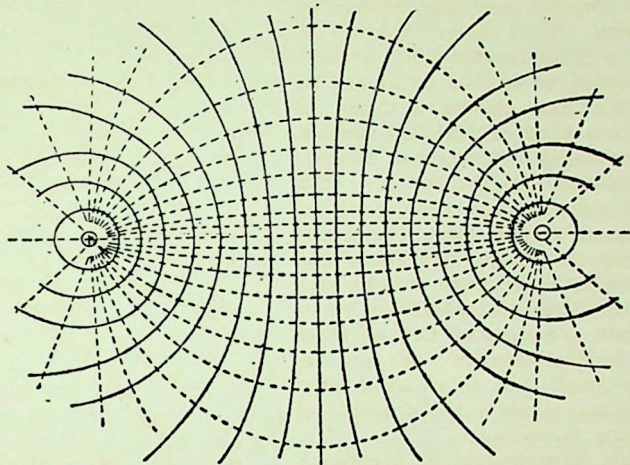


Figure 6. Current Lines (broken) and Equipotential Lines (unbroken) in the Absence of any Conductive Deposit.

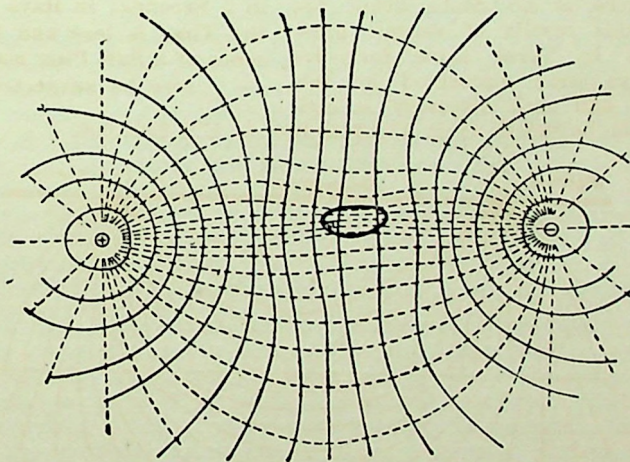


Figure 7. Current Lines (broken) and Equipotential Lines (unbroken) in the Presence of a Conductive Deposit.

the subterranean formations; and ore bodies, especially pyrites and such sulphide ores, are very good conductors.

A great variety of methods have been advocated for electrical prospecting, such as the use of natural earth-currents, artificial introduction into the crust of electricity, weak currents, strong currents, direct or alternating currents, establishing equipotential diagrams, and measuring the intensity of magnetic fields in varying directions, and the expert can use these methods like a master-musician his instruments.

To state briefly the principle of equipotential measurement, it is clear that, if we introduce a current by two poles (electrodes) some distance apart, there will be a fall of voltage between, and, by testing the ground by a movable pole connected with a galvanometer, we may find and plot on a map the lines connecting points of similar voltage. If there is nothing abnormal in the way of conductivity between the two main poles the voltage will fall regularly and the equipotential lines assume symmetrical figures as in Figure 6. But should there be a conductive body, say, an ore deposit, between, then the lines will show bends and kinks as in Figure 7. A new method uses straight-line electrodes, and the normal equipotentials will then be straight whereas an ore body will indicate its presence by curves and kinks.

The inductive method rests upon the well known fact that electricity flowing through a wire creates round itself a "field" of influence, and we still remember the simple experiment of our school days whereby a compass needle was deflected by a current flowing near to it. In a similar way an alternating current produces electricity in a circuit near to, but not touching, the primary flow, and, with high voltage, this influence may be noticed at quite a distance. It is precisely the principle used in inductive electrical prospecting. A loop of insulated wire is laid on the ground and an alternating current forced through it. If there is a conductive body below, a flow of electricity will result in this, which in its turn may induce a current in a circuit above ground to which a telephone is attached. Since there is a phase-difference between the original current and the subterranean one, it is possible to damp out the disturbing influence of the former on the telephone circuit. The telephone will buzz if a conductive body exists below at not too great a depth. The limits of depth depends naturally on the size of the ore-body, but the geophysicist A. Graf gives 1,000 feet (300 metres) as the limit of workability, and this is indeed an impressive figure opening up almost staggering possibilities.

The geophysicist may use a combination of seismic, magnetic and electrical methods, and there will be few problems that do not yield to the resources available to the expert. It was by the inductive method that Boliden, now the premier gold field of Europe, was discovered. The great advantage of electrical prospecting is that it is comparatively very economical, in use. A square kilometre may be thoroughly tested in one month by a party of four, requiring from £400 to £500 in all. This is tens of times cheaper than examination by systematic rock-drilling, since in the latter case most of the holes will draw blank.

HUNTING GOLD WITH ELECTRICITY

THE RADIO-ACTIVE METHOD

Radium emanation is much more frequent along faults and fissures in the earth's crust than where these do not exist, and, by testing water and air from the ground for radio-activity, we may plot such fault-lines on the map. An electrometer is used whereby the ionisation of the air is tested. This method has so far achieved little result in practice.

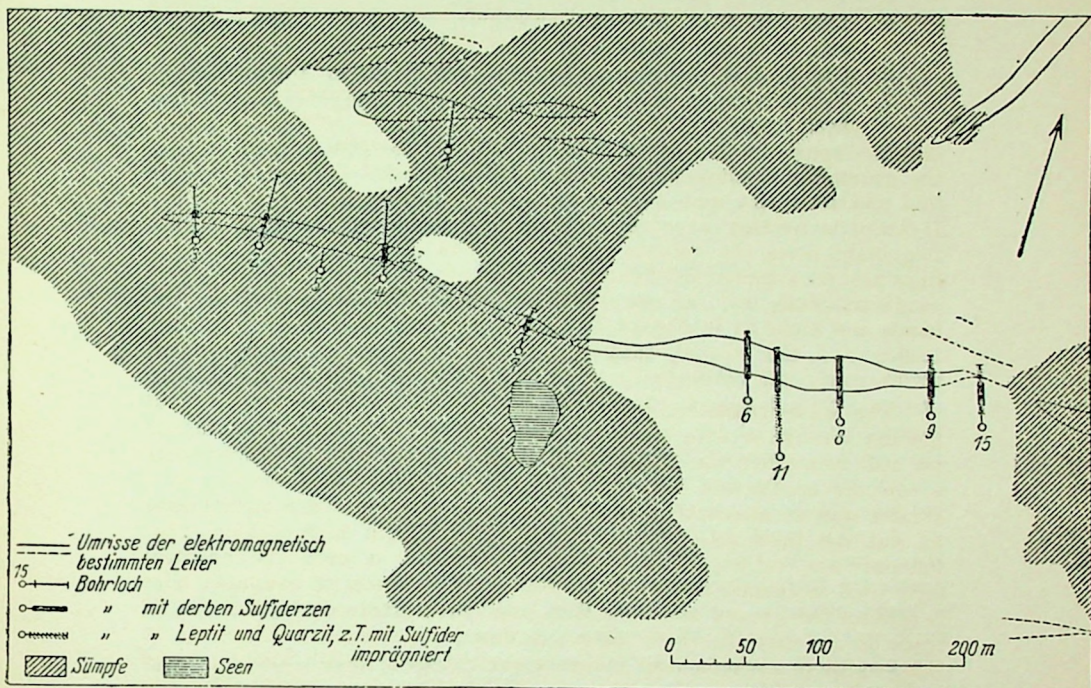


Figure 8. The Boliden Gold Field in North Sweden, which was discovered by the Inductive Method of Electrical Prospecting.

SUCCESS OF ELECTRICAL PROSPECTING

Electrical prospecting has long passed the experimental stage, and its achievements in latter years have been nothing short of sensational, the activity extending to all continents and forty different countries. Examinations may last from one week up to several years. Governmental departments in several countries, Jugo-Slavia, Australia and Sweden, to be explicit have engaged electro-prospectors. Since 1918 the Swedish Geological Survey has cooperated with the Electrical Prospecting Company of Stockholm for their grand schemes in North Sweden, which have been going on year after year and have resulted in the discovery of over a hundred new ore deposits, the most famous being Boliden, as mentioned above, which is now producing nearly a ton of gold a month.

Electrical prospecting methods will serve to tackle the following problems:

1. Searching for and locating new ore deposits.
2. Detailed examination of partly known deposits.
3. Following up ore-veins, also underground in existing mines.
4. Location of auriferous quartz-veins.
5. Location of oil and gas structures, such as anticlines, domes, salt-plugs and fault-lines.
6. Geophysical mapping of hidden boundaries of formations.
7. Tectonic examination of coal-fields and their general structure, fault-lines, etc.
8. Determination of thickness of alluvial formation in river beds for gold mining purposes or for construction of dams, bridges and such engineering work.
9. Determination of depth down to groundwater level.

THE POSSIBLE APPLICATION OF GEOPHYSICAL PROSPECTING IN CHINA

During the last two decades geologists in China have done an immense amount of work, and many new ore deposits have been located. It is not too much to say that the National Geological Survey of China, which next year celebrates its twentieth anniversary, has contributed enormously, not only to the knowledge of stratigraphical sequence of formations, but also in a general way to the better understanding of the country's natural resources, and it is a wonder how the institution, during these troublesome years, has not only been able to carry on, but has attained a very honoured position amongst sister institutions all over the world. The directors, Dr. Wong Wen Hao, Professor C. Y. Hsieh and the late lamented Dr. V. K. Ting, deserve the greatest praise for their determination and love of science for its own sake, and a fine cooperation existed and does exist with their foreign advisers, such as Professor A. W. Grabau and others.

But these geologists will be the first to admit that however useful geology may be in revealing the stratigraphy and tectonics of a mining field and in mapping the formations which may be promising or not, there are times when the occurrence of minerals is so erratic and irregular that the continuation of the deposit underground is hard to estimate, and they would yearn for the "divining rod" of geophysics to enable them to know the secrets hidden underground.

Moreover, there is a very urgent need in China to obtain larger reserves of minerals, since metallic ores, so far known to exist, are not adequate for present needs and still less so for the future requirements of a people set upon the path of progress. Even now lead and zinc are imported into China to the tune of several million dollars a year. And sulphides are badly needed for the production of sulphuric acid, that important pillar of chemical industry. Copper supplies are also quite insufficient.

In the case of tin, antimony and tungsten, China produces a fair share of the world's supply, but the present reserves could be extended

by geophysical prospecting, and this applies also to molybdenum ore and arseno-pyrites.

With reference to oil the present output in China is exceedingly poor. Oil is found in Shensi, Szechuan, Kansu and Sinkiang. It may be that the quantities of oil underground are actually not considerable, and it is a discouraging fact that in Szechuan, at Tze-liu-ts'ing, one has penetrated with native drills not less than 2,000 feet or more and yet found but a poor supply of oil. In view of the acute need of oil for China's increasing motor traffic it would, however, be desirable to ascertain whether or not promising features such as salt-plugs, domes, anticlines and faults exist in the present oil fields.

Regarding the two main pillars of industry, iron and coal, it is to be regretted that the supply of the former is by no means sufficient for present needs and still less so for the future. The iron ore reserves could possibly be extended by gravimetric prospecting. The coal resources of China are no doubt immense and coal exists in every province. It is by far the foremost of all the mineral resources of this country. For a scientific exploitation of the coalfields the miners would welcome extension of knowledge by geophysical prospecting of underground structures such as anticlines, synclines and fault-lines.

Even prospecting for water may be desirable and successful in semi-arid North China.

The triumphal spread of geophysical prospecting all over the world constitutes a challenge to the modern progressive Chinese, whether in Government departments or in private concerns, and they will do well to study these modern methods for enhancement of the mining industry, and for creating new possibilities for the supply of minerals in China.

ENGINEERING, INDUSTRIAL AND COMMERCIAL

AVIATION

Nanking-Yunnanfu Service Planned: Early in January permission was granted by the Ministry of Communications to the Eurasia Aviation Corporation to establish an air service between Nanking, the national capital, and Yun-nan Fu, the capital of Yunnan Province in the extreme south-west. Trial flights were scheduled to take place later in the month. Giant tri-motored Junkers machines are to be used on this service, according to a report in the *China Press* of January 8.

Macao Chosen as Trans-Pacific Clipper Service: It was announced in the local press on January 29 that it had been definitely decided that Macao should be the Far Eastern terminus of the Trans-Pacific air service inaugurated

recently when the famous "Clipper" aeroplanes commenced their regular flights from San Francisco to Manila and back. Macao, a Portuguese colony situated off Kuangtung Province, offers the best operating conditions of any place along the China coast for linking up the Trans-Pacific air route with the China National Aviation Corporation's extensive service, as well as with air services between Europe and the Far East. It will not be long before the Clipper aeroplanes begin the run from Manila to Macao.

Round the World by Air: Next March, says a *Reuter* message of January 19, a round-the-world air service will be completed by the extension of the Royal Netherlands Indies Air Company's ser-

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vice from Sourabaya in Java to Balik Papan in Borneo and thence to the Philippine Islands.

The entire trip will be from Croydon, England, to Sourabaya by Imperial Airways and Dutch lines, thence to Manila by the latter, on to San Francisco by the Pan-American Airways clipper service, thence to Brazil by regular American services, and from Brazil to Europe by the Lufthansa (German) line *via* West Africa, finally reaching Croydon again by regular service across the English Channel.

Fukuoka to be Busiest Airport in Japan: Making it the busiest air traffic centre in Japan, Fukuoka is to have a giant airport by next June. The field is

located 16 kilometres from the city limits and will form the hub of various radiating air-lines to Manchoukuo, Korea, Formosa and eventually to China and other parts of Asia.

Projected Air-line to Tibet: A *Kuo Min* message dated January 6 was to the effect that the Ministry of Communications had issued an order to the China National Aviation Corporation to start preparations for the opening of an air service to be known as the Hsikang-Tibet Airway. The projected line will extend from Batang, the provincial capital of Hsikang (a recently created province on the Szechuan-Tibetan border), to Lhasa, the Tibetan capital, and will link up with the Shanghai-Chengtou air line.

AGRICULTURE

Model Farm Established in Shensi: A model farm has been established at Wei-chu-chen in the southern suburb of Si-an Fu, Shensi, by the Provincial Department of Reconstruction, says a *Kuo Min* message of January 25, the object being to encourage the improvement of agricultural methods in the province.

Insect Pests Cause Heavy Losses: Mr. T. C. T'ang had an interesting article in the *China Press* of January 15 on the subject of losses incurred by the provinces of Kiangsu and Chekiang as a result of insect pests last year. Kiangsu suffered a loss of \$114,387,844, being the value of 28,596,844 piculs (1 picul=133 lbs.) of rice destroyed by a plague of locusts, while Chekiang lost

\$44,317,888 through the same cause. It is believed by experts who have been investigating the situation that violent climatic changes during 1934 were mainly responsible for the increase in the locust hordes. Various methods of combating the pests are suggested.

North China to be a Cotton Belt: According to Dr. Russell G. Shiman, editor of the *Far Eastern Survey*, published in New York, one of Japan's main objects in gaining control of North China is to be able to establish a vast cotton growing region from which she may draw the raw supplies for her cotton goods manufacturing industry. One of the chief difficulties in realizing this scheme is its financing.

BUILDING AND CONSTRUCTION

Bridge Over Whangpoo Planned: A statement in the *China Press* of February 1 was to the effect that it had been definitely decided by the City Government of Greater Shanghai to build a bridge across the Whangpoo from Nantao to Pootung, thereby opening the latter area to more rapid development. The scheme is to be financed by the City Government and a group of French industrialists, the approximate cost to be somewhere in the neighbourhood of \$12,000,000.

Large New Fish Market Completed: The large new Fish Market which has been under construction for some time past on land reclaimed from the Whang-

poo River by the Whangpoo Conservancy Board in the Yangtzepoo district of Shanghai has now been completed and will be opened in the near future. Built at a cost of \$1,000,000, this commodious building is destined to revolutionize the \$50,000,000 fish business of Shanghai. It has splendid cold-storage facilities, and it is expected that the bulk of the business formerly conducted in the fish market on the Nantao Bund will be transferred to this new building. Other facilities are adequate modern wharves and godowns to receive cargo, which includes \$20,000,000 worth of fresh and salted fish from China seas and \$30,861,000 worth of fish from foreign sources.

MINING

Iron Ore Discovered in Fukien: Rich deposits of iron ore have recently been discovered at An-ki in Southern Fukien through surveys made by engineering experts of the Provincial Department of Reconstruction, the amount of ore being estimated at 40,000,000 tons. The ore is said to be better than that of the famous Han-yang mines in Hupeh or the Ping-sing mines in Western Kiangsi, containing, as it does, 60 per cent. of iron.

Sino-Japanese Exploitation of Kuang-si Manganese: A *Domei* message of January 30 was to the effect that a joint Sino-Japanese concern was being organized to exploit manganese and iron ore deposits in Kuangsi Province, the concern to be known as the Chung Jin Kung-ssu and will have a capital of Y.15,000,000.

It will be established in collaboration with the Kuangsi Provincial Government.

Shansi Coal Industry to be Encouraged: The Ministry of Railways has granted a petition presented by the Peiping-Suiyuan Railway Administration to extend the period for reduced freight rates on Shansi coal for another year in order to encourage the development of the Shansi coal mining industry, said a *Kuo Min* message of January 28 from Nanking. It may be remarked that the only possible way of making Shansi coal worth mining is to keep the cost of transporting it to the coast down to a minimum, at least till such times as industries in the province have developed sufficiently to ensure a steady domestic market.

COMMERCE

Huge Shanghai Commercial and Industrial Exhibition Planned: According to a statement in the *North-China Daily News* of January 18 proposals are under consideration for the holding of a monster exhibition in Shanghai next summer in the interests of commerce, industry and education. It is stated that an area of 2,000,000 square feet on the foreshore of the International Settlement has been acquired for this purpose, and already five months have been spent in making preliminary technical arrange-

ments. Although the report does not say under whose auspices the exhibition is being organized, the name of Messrs. Chiming Partners is mentioned as the designers of the building to house it, and that of Mr. Sidney J. Powell as the supervisor of construction work. Details of the financing of this ambitious scheme are not revealed.

The idea appeals to us as an excellent one, and we only hope it will be duly carried out.



MIGRATION NOTES¹

BY

G. D. WILDER

A recent two-day visit to the Lin-ting bird sanctuary in mid-winter showed the bird population sadly diminished, yet hopeful of another successful nesting season. The almost zero weather of late has sealed up the pond tight, the intense cold forming long cracks across the ice. Three spotted-neck turtle doves dozed in the sun on the chimney tops or roosted where thick cedars and junipers filtered the violence of the wind. Two or three groups of hilarious chickadees frequented the shrubbery and small trees, amongst them both the Japanese tit (*Parus major artatus*), which stays the year round, and the marsh tit (*Parus palustris hellmayri*), which I have not yet found here in summer. A pygmy woodpecker seemed at home and doubtless is an addition to the list of potential summer residents. A flock of yellow-browed buntings, and quite likely some rustic and least buntings also, shared the shelter of the cedars with the doves; but it would only be for the winter. The rooks sat about in the sun when it shone, as though holding their claim to the trees for their colony. But no azure-winged magpies appeared during the two days, though they could not have been far away. There was not a vestige left of a single nest of the twenty-five or so built last summer. All had been blown down, which is proof of the haste and carelessness with which they were constructed after the felling of the two big home trees in the compound last year after the nesting season had commenced. This visit has reminded me that from September 14 to 24 I made a visit to the compound which provided me with observations to supplement what I wrote last June regarding the large number of nesting birds seen in there. I then described the scattering of the rook colony to the four quarters, and the use of the abandoned nests after the young rooks flew off by the azure-winged magpies, the kestrels and the red-footed falcons, and also gave a list of fourteen species (it should have been fifteen) that nested in or near the compound with twenty-four known nests within its walls.

¹ These are supplementary to "The Ecology of Nesting Birds in Lin-ting Compound," *The China Journal*, Vol. XXIII, No. 4, October, 1935, and are dated December 31.

The life of the pond was made intensely interesting in September by the large family of young little grebes and their parents that splashed and chattered in the broad fringe of reeds all round its border, and occasionally all together came out upon the open water to dive and feed and go to grebe school. The adult males still had their bright plumes, and their loud ringing chattering calls sounded out from their hiding places at intervals through the day from dawn to dusk and occasionally at night when the moon was shining. They seemed to start earlier or later in the morning according to whether it was clear or cloudy weather. At my next visit, October 12 to 14, young and old were all in their plain winter plumage. Their chattering calls, beginning loud and dying away, had changed to a few loud clucks, so much of the same timbre that I inferred that they came from the same throats, though I could never catch the birds in the act of making them. I could see no other bird that could have made those sounds, so that I think my inference was correct, though it is possible that the rare water cock, the white-breasted water-hen or the jacana (water pheasant) might have been lurking in the reeds and have uttered the notes. I have seen specimens of each of these three species of water fowl but three or four times in all my life in North China, and do not know their notes, so that it is most unlikely that any of them were present to confuse me in the identification of the calls of the little grebes. On November 22 and 23 the grebes had left the pond so far as I could tell by a cursory examination, though members of the species were to be found amongst the coots, ducks, and geese of the large pond in the Sand River (Sha Ho) bed just north of the city wall extending to the pagoda five *li* away.

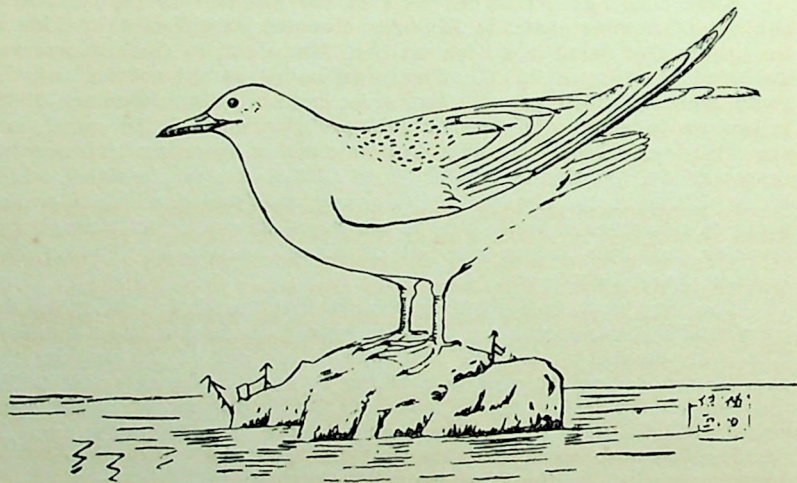
These little grebes (*Podiceps ruficollis poggei*) are an addition to the list of nesting birds in Lin-tsing. Another addition to the list is proved by the young night herons that flew about in the evenings and gathered at the pagoda. They were probably hatched not far away in some more secluded grove. The great reed warbler, stopping on its migration in seasons of less drowth, probably nests in our pond, and the white-necked crow surely has its nest in some big tree not far from us. So, too, the Eastern little owl (*Athene noctua plumipes*), which hides in holes in the city wall. The pygmy woodpecker, which is always resident wherever I know him at all, must stay with us through the summer, and this brings our list of almost certain breeders in this vicinity up to twenty-one.

The long visit in September showed that the birds nesting in the compound last summer were fairly successful in rearing their families. The spotted-neck turtle dove that was driven out of its nest by the azure-wings did not succeed in hatching its eggs in the new nest under the vine on the trellis, but at least one family was raised in the compound and still lives there. The young falcons of both species were in evidence, as also were the Japanese tits and the young azure-wing magpies, marked by the large white tips to their tail feathers.

My records of migration down here on the Shantung plain are not numerous enough to give any basis for comparison with that in the Peiping region, but there are two or three occurrences that I would

deem noteworthy anywhere. White's thrush (*Turdus dauma aureus*), the largest, showiest and amongst the rarest of our thrushes, was seen twice in the Lin-ting compound, September 16 and 24, and again in Te-hsien on October 8. I have seen this bird wild only three or four times and dead perhaps as many in all my China experience. The same is true of the broad-billed roller (*Eurystomus orientalis calonyx*), a most beautiful bird in blues, greens and purple, with red bill and legs, about the size of an oriole. Two of these birds stayed around the willows of the Te-hsien compound from September 6 to 12 this year. They did not give any exhibition of their peculiar rolling in flight. Perhaps that is done only in breeding season or in longer flights than any I saw, but they gave me my first opportunity to hear their chatter, like the rattling of stiff paper attached to a bicycle frame so as to flap over the spokes of the revolving wheel. It was uttered when one bird was flying toward the other at rest. They kept flying back and forth between the trees and had a noticeable long free volplane glide down to their perch. They are easily identified when in flight by the large white spot in the centre of each dark wing. Close up, however, the spot is seen to be a most delicate light blue.

The geese, ducks and waders having come into a fine expanse of water a mile and a half long by three-quarters of a mile wide, in the usually dry bed of Sand River just north of Lin-ting's impressive north wall, only a ten minutes walk from the compound, on my September, October and November visits I spent as much leisure as possible studying the waterfowl there. In both September and October visits² the main feature of migration was the number of red-footed falcons almost constantly migrating across the scene, hunting as they travelled, ranging



The Brown-headed Gull (*Larus brunnicapillus*, Jerdon)
in Winter Plumage.

² September 14 to 24; October 12 to 14, 19, 20, 23 and 24.

FURTHER BIRD RECORDS FROM JEHOL

at intervals of a few hundred yards or less, interspersed with an occasional harrier or other falcon. But instead of travelling from north to south they, and other migrants too, regularly came into view from almost west and disappeared to the east-south-east. Two species of terns, probably the common tern and the white-winged black tern, and our commonest swallow, the house swallow, were also diligently pursuing their migration route with the hawks. They, too, were hunting as they flew. The water birds would come in from the west at the north end of the ponds, turn and hunt straight south to the limit of the water and then resume their eastward route. I do not know whether this is a regular annual route or was due to some change in water bodies this season. Other interesting migrants seen were the honey buzzard, the grey glover, the greenshank and the pallid thrush.

FURTHER BIRD RECORDS FROM JEHOL

Some time ago Father G. Seys of the Missions Belges de Scheut published an annotated list of birds observed or collected by him in the province of Jehol in a book entitled "Notes sur les Oiseaux observés au Jehol de 1911 à 1932." This was issued as Number 27 of the *Publications du Musée Hoang ho Pei ho de Tien Tsin* in January, 1933. It was reviewed in *The China Journal* of December of the same year, page 330.¹ Altogether some 284 species and subspecies of birds were recorded.

In a letter written at a place which he calls "Songchoutsoeize" and dated September 22, 1935, Father Seys records six more species from this area, as well as supplying interesting notes on some of the forms previously recorded. A translation of this letter is as follows:

As I know that you are interested in all branches of zoology I am sending you herewith some notes complementary to my list of birds of Jehol published in 1933.

Since that date I have secured several species which I had not previously met with in this region, namely:

1. *Acrocephalus sorghophilus* (Swinhoe). I saw three or four at Songchoutsoeize on June 6 and killed one male.
2. *Acrocephalus agricola tangorum* La Touche. May 25 and probably on June 1.

¹ Vol. XIX, No. 6, December, 1933.

3. *Dryobates nanus scintilliceps* (Swinhoe). For a long time I have sought this little woodpecker, and at last I have found it. It appears, at least in the environs of Songchoutsoeize, to be confined to a small area with a radius of a kilometre or more. I encountered it on my three visits to this place (May 28, 1934; September 18, 1934; March 22, 1935), where, however, it is so rare that on each occasion I saw but one or two specimens. It was not till my last visit that I was able to kill one.

4. *Butorides striatus amurensis* Schrenck. A female was killed in the same place on May 25. As I shot too low, it was wounded only in the feet. It flew to a group of trees, where, unable to use its feet for perching, it hung on to the branches with its beak. Its stomach contained the remains of fish and two gross of dragon-flies (*Aeschna*).

5. *Anser fabilis fabilis* (Latham)

6. *Anser albifrons albifrons* (Scopoli). I saw a fine specimen of this species in our college at Chanwanze, and this goose had the legs flesh coloured as in No. 201 (under the name *Anser fabalis serrirostris* Swinhoe) of my list, which probably belonged to the same species (*A. albifrons*).

In my list of birds of Jehol I gave *Sitta europaea amurensis* Swinhoe as the subspecies in Jehol. As I have been able to examine two more nuthatches killed at Songchoutsoeize, I am inclined to believe that we have two subspecies in Jehol. That of the Weitch'ang (Hunting Grounds) is *Sitta europaea kleinschmidtii* Hartert. That which one meets in winter at Songchoutsoeize, not so much on account of its shape as because of the clear colour of its under parts, approaches more closely to *Sitta europaea baicalensis* Taczanowsky.

The purple heron (*Ardea purpurea manillensis*), which passes here each year in small numbers, has been particularly abundant this year; not that I have seen large flocks, but, from April 28 to June 23, one was always able to see one or two, rarely four, in spite of the fact that four were killed by myself and other hunters. Who knows that they did not have their nests somewhere near? I also saw a flock of eleven on September 19 in 1933.

This year they brought me a fine specimen of *Ciconia ciconia boyciana* Swinhoe (the white stork), killed on April 4 twelve kilometres from here. Some days later I saw one myself.

Gallix cinerea (the water cock) is not as rare here as I thought. I killed another adult male on June 3 and saw a young one of the year, killed at Chihfeng early in October. It is probable, therefore, that this species nests to the north of the latter town. I killed another specimen of *Ninox scutulata* on June 9, and they brought me some young of *Athene noctua plumipes*, already able to fly, on June 14.

Certain birds were observed this summer on later dates than before, some because they left for the north later, and some, perhaps, having nested in this latitude. Following are some of these: *Coturnix coturnix japonica* (June 15); *Ciconia nigra* (June 23); *Circus melanoleucus* (June 6); *Anas penelope* (a flock of four on June 21); *Tringa nebularia* (June 6); and *Tringa hypoleucos* (June 13).

THE GROWTH OF THE GOLDFISH (CARASSIUS AURATUS)

BY

HSI J. HO

(The Biological Laboratory of the Science Society of China)

The goldfish has a very long history under domestication in China. It was first recorded over a thousand years ago. In ancient times it was believed that when the eggs of the silkworm were laid on new tiles or bricks and were placed below the water's surface in hot sunshine, a few days later goldfish would be hatched. Of course we know this is by no means true. Hamid (1929) described the early development of the goldfish, and Stromaten (1931) described the development of its gonads. The present writer (1933) has described its breeding habits. Here its growth phenomena with some minor points of interest are presented.

TABLE SHOWING THE RELATION BETWEEN TEMPERATURE AND
DEVELOPMENT OF EGGS

Date of Oviposition	Tempera- ture of Water in Centigrade	Time in hours and minutes from fertilization to the stage of					
		Rise of the blastodisc	2 cells	4 cells	8 cells	16 cells	Hatching
April 21	13.7	—	1:45	2:30	3:15	4:00	168:00
.. 28	16.8	1:00	1:22	1:15	2:18	2:40	150:00
.. 29	17.4	1:10	1:23	1:53	2:20	2:45	144:00
May 2	19.5	0:55	1:26	1:45	2:10	2:30	120:00
.. 6	16.2	1:10	1:36	2:00	2:30	2:55	110:00
.. 10	21.8	0:45	1:00	1:20	1:35	1:55	85:00
.. 26	20.8	0:50	1:00	1:25	1:50	2:10	72:00
June 2	22.0	0:42	0:55	1:15	1:35	2:00	60:00
.. 6	22.8	0:35	0:43	1: 5	1:20	1:38	52:00
.. 7	21.8	0:45	1:00	1:30	1:50	2:20	60:00
.. 11	23.4	0:40	0:55	1:20	1:40	1:55	48:00
.. 12	26.1	0:33	0:40	1:00	1:20	1:40	52:00
.. 24	24.2	0:37	0:50	1:10	1:30	1:55	58:00

Two or three minutes after the sperm cell comes into contact with the ovum after the process of artificial fertilization, the perivitelline space and fertilization membrane of the latter become clearly visible, and the egg becomes semi-transparent. Shortly before segmentation, the germinal disc becomes raised to a certain extent, forming an elliptical elevated area. The appearance of cleavage of the egg at different stages are very regular and are shown in the accompanying plates.

The temperature of the water plays an important rôle in the rate of development of the fertilized egg. In April, when the water temperature is rather low, the eggs hatch very slowly, requiring from 150 to 170 hours to complete the process. As the temperature of the water rises the time required for the development of the egg decreases gradually, till, towards the end of June, it takes only about 50 hours. Details of the relationship between temperature and the various stages in early development are shown in the foregoing table.

The beating of the heart first appears in the embryo at the age of 26 hours under a temperature of 22°C. It is very weak and slow, and consists only of from 50 to 70 beats a minute. As the embryo grows it becomes quicker, so that in the embryo of 35 hours it increases to from 70 to 90 beats a minute. In the embryo just before hatching and the fry immediately after hatching the frequency of the heart beat is almost the same, that is, from 100 to 140 a minute. In these stages 163 cases have been investigated, the following data being secured:

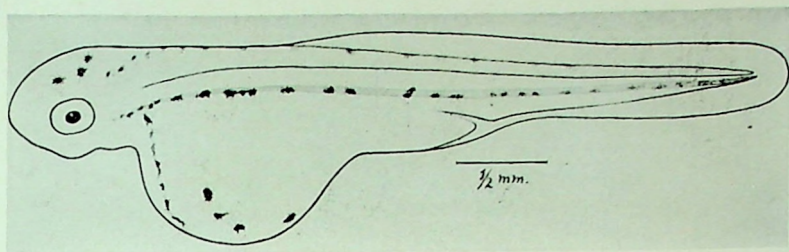
Times a minute	Cases
80-90	2
90-100	12
100-110	50
110-120	32
120-130	28
130-140	23
140-150	14
150-160	2

If the temperature is high or the individual is not living under normal conditions, such as too little water in the vessel containing it, the beat of the heart may be faster.

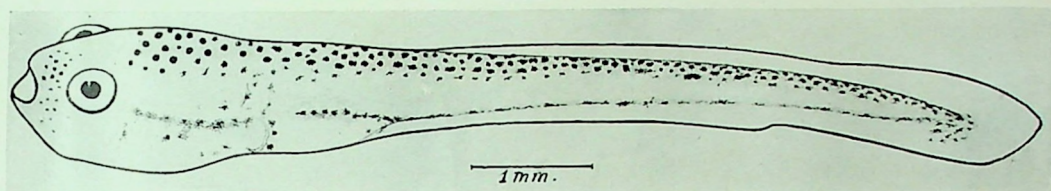
The newly hatched fry are from 3.8 mm. to 4.6 mm. in length, and 0.49 mg. in weight. They often rest upon the leaves of aquatic plants. When contained in a small vessel, they sink to the bottom with one side downward. If disturbed they swim very quickly by the vibration of the continuous delicate membranous caudal fin, but they can not swim very far. Stellate spots of dark pigment are scattered loosely on the dorsal surface and three or four on the side of the yolk sac. These pigment spots increase in number as the fish grows, when the latter is five days old they become somewhat rounded in outline and very numerous, especially on the dorsal surfaces of the head and body.

Fry were measured under the binocular microscope, and weighed with a very sensitive balance every two, three or even more days. When quite young they were dried on blotting paper, after which a large number of them were weighed together, the weight being divided by the

THE GROWTH OF THE GOLDFISH (*CARASSIUS AURATUS*)

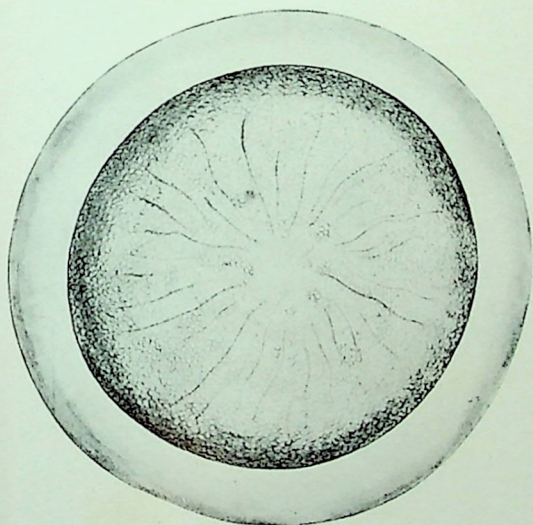


The newly-hatched Fry of the Goldfish.

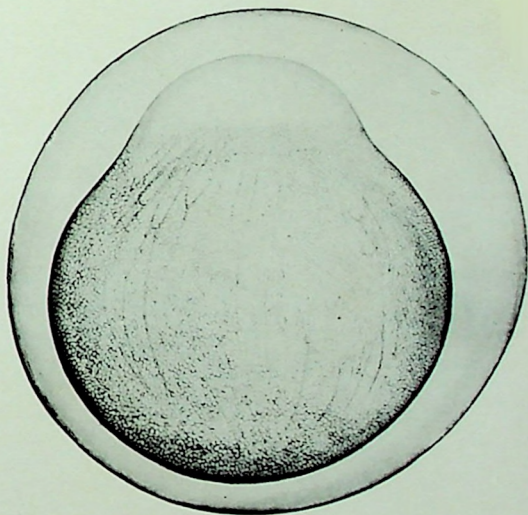


The Fry of the Goldfish at the Age of Five Days.

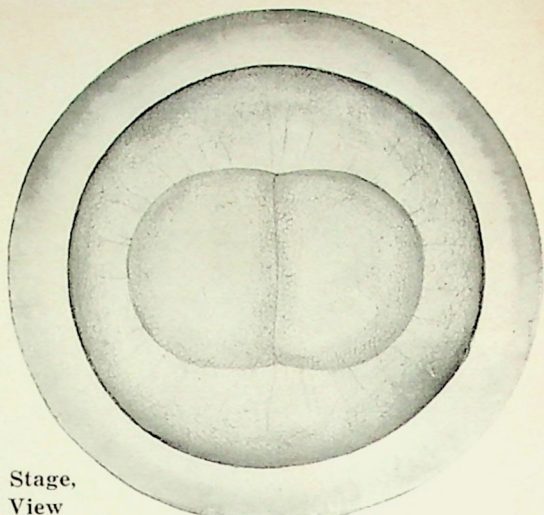
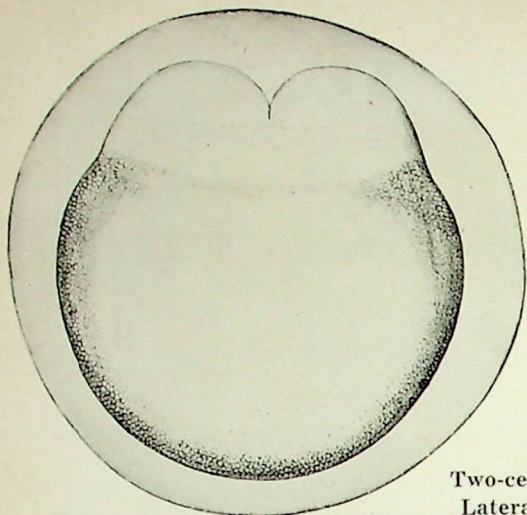
THE DEVELOPMENT OF THE EGG



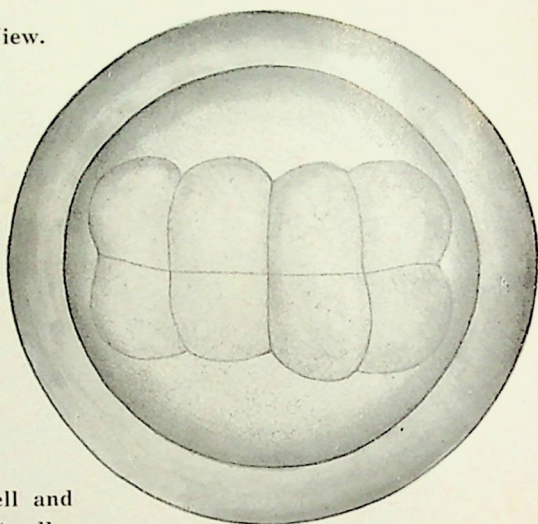
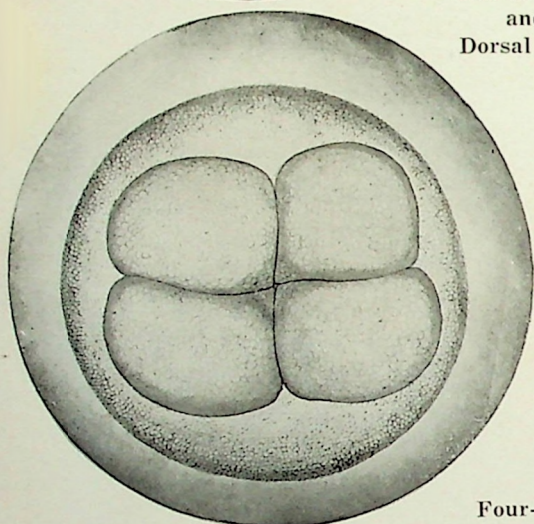
Fertilized Egg



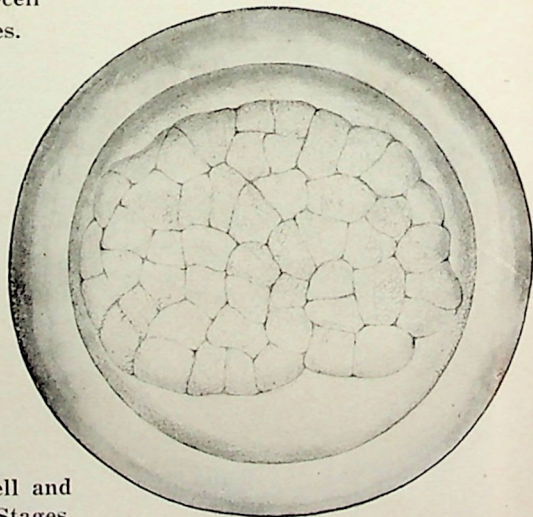
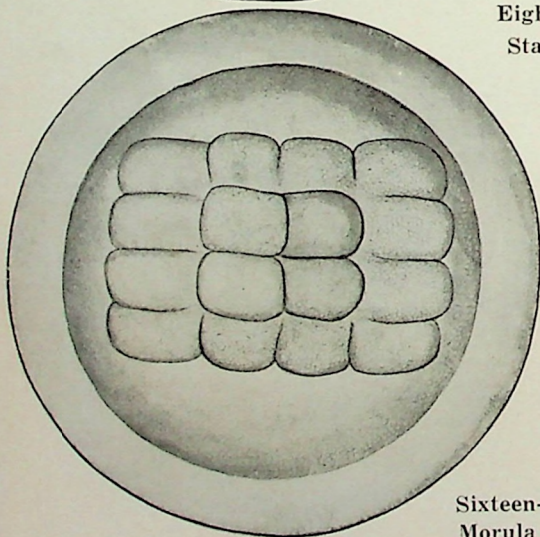
Rise of the Blastodisc, lateral View



Two-cell Stage,
Lateral View
and
Dorsal View.



Four-cell and
Eight-cell
Stages.



Sixteen-cell and
Morula Stages.

GROWTH OF THE GOLDFISH (*Carassius auratus*)

number of fishes. It was found that the growth-rate of the body weight is slow during the first three days, but much quicker afterwards.

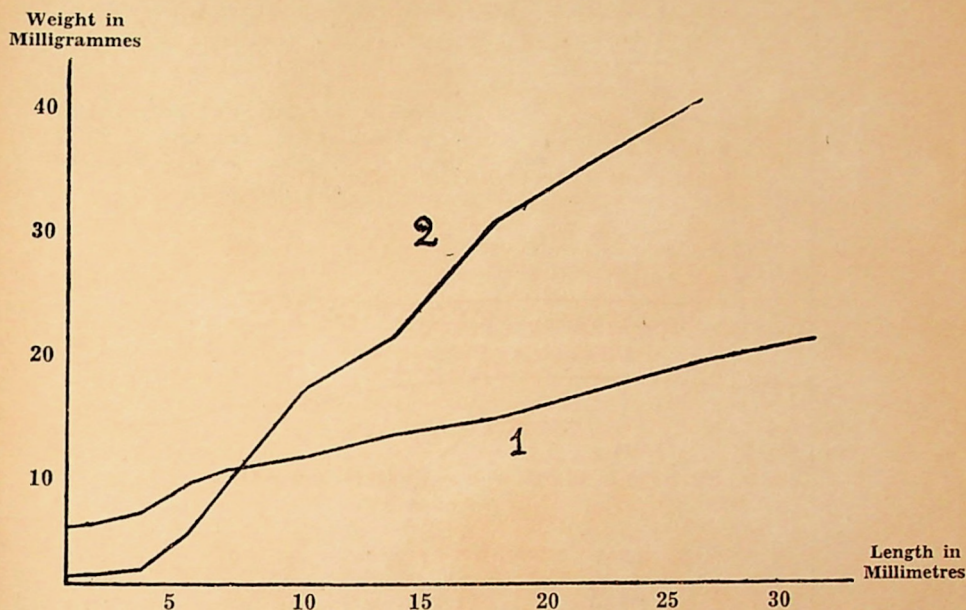


Figure 1. Line 1 shows growth of body. Line 2 shows increase in body weight.

The growth-rate of the body length is rapid when the fishes are quite young, and slows up gradually as they grow older. This phenomenon does not seem to have much to do with temperature. In May and June the temperature is not as high as it is in July and August, but the fry grow more rapidly in the former period than in the latter. A large number of fishes were measured when they were 50, 100 and 150 days old, the average increase of body length for each fifty days being as follows:

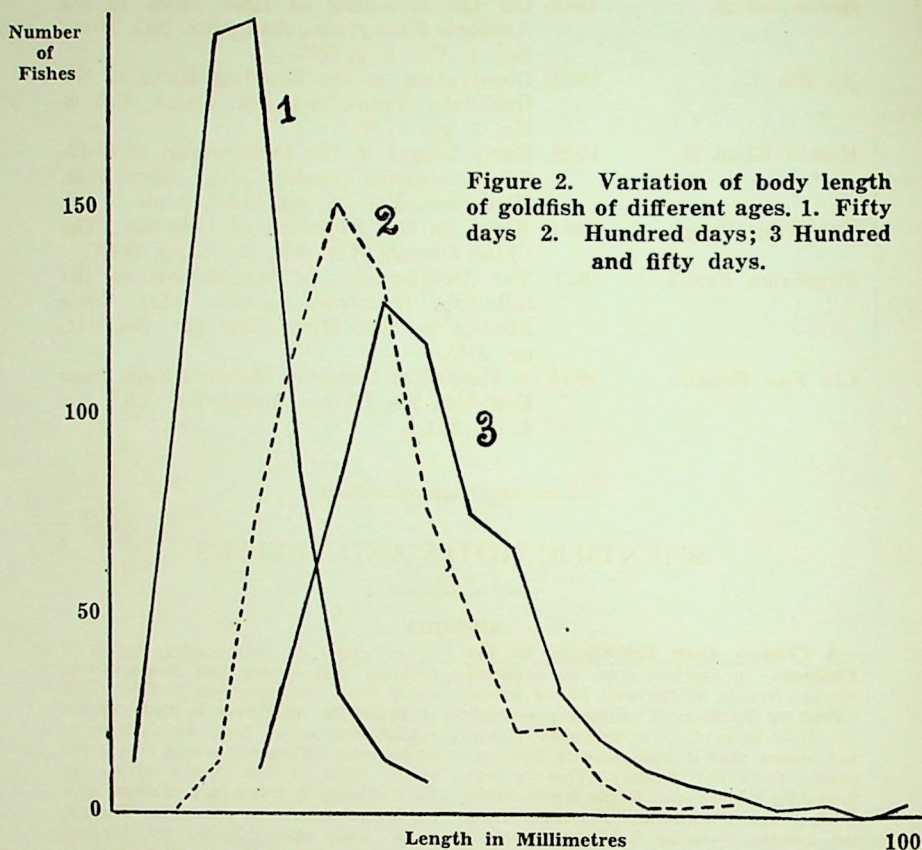
First 50 days, April 26-30 to June 15-19, was 22.2 mm.

Second 50 days, June 15-19 to August 4-8, was 15.0 mm.

Third 50 days, August 4-8 to September 23-27, was 7.8 mm.

Individual variation is also very great, the length of 150-day old fishes showing a difference of 75 mm. between the longest and the shortest.

Fishes about one year old and able to breed are considered to be mature. If there are a great number of them in the same vessel their growth may be very much hindered, some even remaining immature at the end of the first year. I often put about hundred fishes in each large vessel, and feed them carefully throughout the year. In the next



spring about half of them remain small in size and unable to breed even in the warm season of the year. Among them, however, the mature ones swim about very actively, chasing each other. They breed as well as the normal ones. The body lengths of one year old mature fishes are from 40 mm. to 120 mm.

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SCIENTIFIC NOTES AND REVIEWS

BIOLOGY

A Chinese Crab Established in the Thames: In our last issue we discussed the appearance of the well known hairy-clawed or mitten crab (*Eriocheir sinensis* H. Milne-Edwards) in European rivers, and stated that it had recently been reported from the Thames. This is confirmed by a news item in the *North-China Daily News* of January 16, taken from the *London Evening News*, in which a correspondent describes the presence of these crabs in considerable numbers in the estuary of the Thames, where they burrow into the banks. How this Chinese species came to be introduced into European rivers in the first place and thence into the Thames are questions which are exercising the minds of scientists. That the mitten crab is very destructive is a well established fact: that it is edible and constitutes an important food item in China is not so well known. It may ultimately be looked upon as a welcome immigrant by the people of Europe.

The Scales and Teeth of Fishes: Most British and American who go in for angling as a sport know something about the telling of the age of such fishes as the salmon and trout by counting the

growth-rings on their scales, but it is probable that outside this comparatively small circle and the even smaller circle of zoologists who make a study of the subject fish scales have no significance whatsoever. Even more does this apply to the teeth of fish. Yet a perusal of Dr. Yuanting T. Chu's book "Comparative Studies on the Scales and on the Pharyngeals and their Teeth in Chinese Cyprinids, with Particular Reference to Taxonomy and Evolution," issued in January, 1935, by the Department of Biology of St. John's University, Shanghai, as No. 2 of its Biological Bulletin, will reveal the fact that there is much of interest in the teeth and scales of fish, at least to the student of natural history. According to the preface of this work an immense literature on the Chinese cyprinids (fish of the carp family) has accumulated during the past hundred years, most of which, however, has dealt with collections of fishes made in various parts of the country, identifying the forms describing new species, giving artificial keys to classification, and the like. There appears to have been no serious attempt to study the Chinese *Cyprinidae* as a whole on a comparative

basis and to evaluate the usefulness of the characters offered by different structures as a means of classification and determination of the phylogenetic relationships of the species. Dr. Chu, therefore, proceeds to make a close study of the pharyngeal teeth and the scales of the numerous members of the carp family in China from these angles, the result being a highly useful book for those engaged in the study and classification of Chinese fishes. The book is divided into two parts, Part I, dealing with the scales and Part II with the teeth. The scales and teeth of all the known species of carp in China, and their number is very considerable, are described in detail, and illustrated in excellent plates. Incidental-

ly, the opportunity is taken to describe seven new genera, namely, *Daniooides*, based on *Danio kakkhiensis* Anderson; *Nicholsicypris*, based on *Aphyocypris normalis* Nichols and Pope; *Atrilinea*, based on *Barilus chenchiwei* Chu; *Rohanus*, based on *Ischikawia transmontana* Nichols; *Sinigobio*, based on *Gobio sihuensis* Chu; *Percocypris*, based on *Leptobarbus pingi* Tchang; and *Herzensteinia*, based on *Schizopygopsis microcephalus* Herzenstein. Redescriptions of a number of genera, already accepted, are also given, so that the whole work actually partakes of the nature of a monograph on the cyprinid fishes of China, a useful bibliography also being given.

GEOLOGY

The Loess Deposits of North China:

Most people are familiar by now with the name, if not with the appearance, of the strange deposit of yellowish earth called Loess that lies like a mantle over a large part of North China. Although it has formed the subject of investigation on the part of many scientific explorers, beginning with Baron von Richthofen, neither its origin nor peculiar characteristics have yet been explained to the satisfaction of everybody, and it may be still described as a geological puzzle. It forms into steep perpendicular cliffs, is fairly compact and is composed of grains of silica and other material far smaller than the grains of sand on a seashore yet not unlike them. The cliffs have a very characteristic vertical cleavage, and all through the body of the loess run little tubes in a more or less vertical direction ranging in size from very minute capillaries to tunnels that might have been bored by an insect or even a small rodent. In places are to be found layers of chalky nodules, not unlike the flint nodules found in the chalk deposits of England and France. Loess readily crumbles to form an impalpable powder, which on the roads running through the loess country is very trying

to the traveller. The loess cliffs are sufficiently compact to enable the people living in the country to excavate vaulted caves in which they live. These are warm in winter and cool in summer.

Recently through the kind offices of Mr. Raymond T. Moyer, of the Oberlin Shansi Memorial Schools at Tai-ku Hsien in Shansi, the Shanghai Museum (R.A.S.) has received a fine sample block of loess cut from a cliff in the vicinity of that town. It is original loess and not redeposited loess such as is found in the great valley-plains of Honan, Shansi, Shensi and Kansu, and of which the great plains of Hopei and Shantung are mainly formed. In the *Geographical Journal* (Royal Geographical Society, London), Vol. LXXXVI, No. 1, July, 1935, Dr. George B. Barbour, who has carried out extensive geological research in China, presents an excellent paper entitled "Recent Observations on the Loess of North China," and we cannot do better than recommend those of our readers interested in the subject to read this paper. A few photographs showing loess deposits in Shansi and Shensi are reproduced in the accompanying illustrations.

ASTRONOMY

Total Eclipse of Moon Seen in Shanghai: Perfect weather conditions prevailed in the Shanghai area on the night of January 8, enabling residents to enjoy a good view of the total eclipse of the Moon. Entering the penumbra at 11:16 p.m., the Moon was in complete eclipse from 1:47 a.m. on January 9 to

2:21 a.m., leaving the penumbra at 5:01 a.m. For some reason there was not nearly as much hubbub on the part of the Chinese as usual, although there was a certain amount of cracker firing and beating of gongs and tin cans. This is done by the superstitious to prevent the heavenly dog from swallowing the Moon.

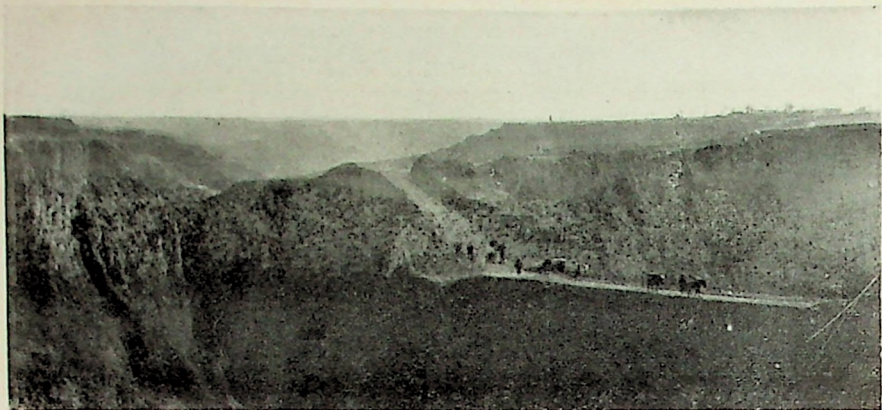
THE LOESS DEPOSITS OF NORTH CHINA



A large Part of the Northern Provinces of China is covered with a thick Mantle of strange Yellow Earth called Loess. It shows a very characteristic Cliff Formation and has a Vertical Cleavage that has long puzzled Geologists. Recently, through the good Offices of Mr. Raymond T. Moyer of Tai-ku Hsien, Shansi, the Shanghai Museum (R.A.S.) has received a fine Specimen Cube of Loess. In the Picture a Chinese Assistant is pointing out the Place where the Specimen was secured.



Loess Cliff Formation overlying Sandstone Strata in Western Shansi. From
"Through Shen-Kan" by Clark and Sowerby.

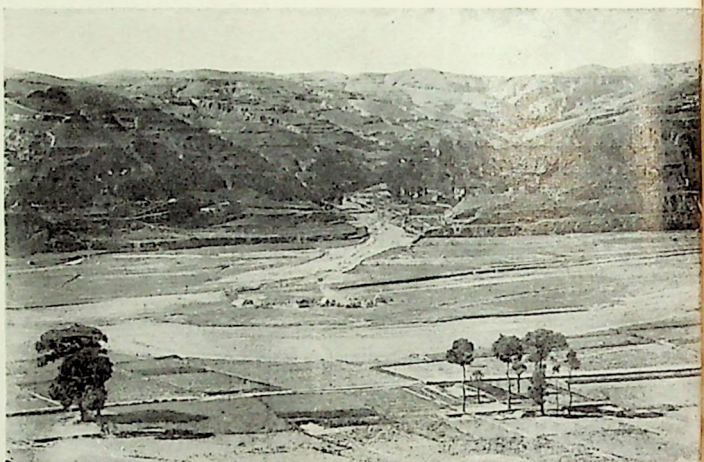


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In North-central Shensi the Loess lies like an immense Plateau above the Sandstone Formation, intersected with deep and precipitous Ravines caused by Erosion.



On the Right may be seen Loess Hills and Terraces bordering a wide River Valley at Lin Hsien in West Shansi.



Sometimes the Loess in Shansi and Shensi shows distinct Stratification as in this Picture taken on the Clark Expedition (1908-1909) in Western Shansi.



From "Through Shen-Kan" by Clark and Sowerby.



Vast Sunspots Observed in December:

The biggest group of sunspots seen for five years were to be observed passing across the face of the Sun early in December. The area covered by the group on December 1 was 200,000,000 square miles, the length of the group being 140,000 miles, which was about 25 per cent. bigger than a group seen a few weeks previously, itself considerably larger than usual. Dr. H. Spencer Jones, Astronomer Royal, is reported to have stated that the appearance of the December groups afforded further striking evidence of the advance of the new sunspot cycle.

It would be interesting to know if scientists believe that the unprecedentedly severe weather that has prevailed throughout the Northern Hemisphere during the past two months is traceable

to the presence of this unusually large group of sunspots.

Meteor Strikes Earth in Rhodesia:

It is not often that there occurs an authentic record of a meteor reaching the surface of the earth. Usually they are consumed long before they penetrate the enveloping atmosphere to a sufficient depth for this.

Recently, however, a *Reuter* message from Livingstone in Rhodesia reported a meteor, which passed over the town just after sunset, striking the earth about a mile east of the Falls, causing a slight earth tremor and giving forth a roar as of thunder. It was noticed that the meteor shed jagged particles from its incandescent surface as it travelled and left a distinct luminous trail behind it.

SEISMOLOGY**Monthly Record of Earthquakes:**

In a severe earthquake in the Ping-shan district in Szechuan the entire village of Si-ning, consisting of some fifty houses, was destroyed on January 6, four people being killed and over forty seriously injured. During the preceding few days, Cheng-tu, capital of Szechuan, was rocked by a series of earth tremors.

METEOROLOGY

The Weather in China During January: The unsettled weather which prevailed towards the end of December throughout China continued through the early part of January. In the Shanghai district January 1 was a thoroughly wet day, but thereafter it cleared up and was bright and cold for several days with a little rain on January 7 and again on January 11. On January 13 rain throughout the day turned to sleet in the evening, the day following again being thoroughly wet. Bright very cold weather followed till January 24, when rain during the day turned into a heavy fall of snow in the evening. The lowest temperature recorded was on the night of January 17, when 15°F. was registered on Lucerne Road in the Western district.

From January 25 to 31 the weather was more or less fine and clear, with frost every night.

Heavy snow was reported as covering the whole Yangtze Valley at the beginning of the month, snow still falling late on the night of January 2. Throughout North China and Manchuria the cold was intense, 37 degrees below freezing being recorded in Peiping. In Inner Mongolia

On January 10 numerous towns on the Ecuador-Colombia border experienced a severe earthquake, which resulted in many deaths and considerable damage to property. The loss of life ran into the hundreds, in some places entire villages being obliterated by landslides and lava streams, the latter from Mount Manzano, a long inactive volcano in the district.

37 degrees below zero Fahrenheit, or 69 degrees of frost was recorded.

On the night of January 13 a sharp drop to several degrees below zero Fahrenheit was registered in Peiping, causing the death of many beggars on the streets. This cold spell continued enveloping a vast area in North China, where the sea ports were clogged with ice for the first time in twenty years. In Tsi-nan Fu -17°F. was recorded.

In North Manchuria too cold was so intense that several trains were wrecked as a result of steel rails cracking. In Harbin -50°F., or 82 degrees of frost, was registered on January 19.

Along the Yellow River dykes collapsed under the constant pounding of ice sheets. Steamers were ice-bound at the Taku Bar, Tientsin, and both Chefoo and Tsingtao Harbours were packed with ice, greatly hampering the movement of shipping. All sailings for Tientsin were discontinued by Shanghai shipping firms towards the end of the month.

Northern Hemisphere in Arctic Grip:

Not only did North China and Manchuria suffer severe weather during January, but

the whole Northern Hemisphere seems to have been in the grip of Arctic conditions.

Heavy snow was reported throughout Western and Northern Japan on January 7, snow having been falling for the four preceding days in the Tohoku section, while intense cold held the whole country in its grip on and about January 17.

On January 19 a heavy snowstorm was reported as sweeping over Central Russia. This had been preceded on January 10 by a disastrous storm throughout Western

Europe and gales which swept the British Isles early in January and again on January 9 and 10.

Even worse conditions existed in North America where Arctic weather prevailed throughout the United States after gales along the Pacific coast on January 13 and following dates. By January 26 the toll of dead resulting from the intense cold had mounted to two hundred, and there seemed to be no appreciable lessening in the severe conditions as the month drew to a close.

MEDICINE

A Severe Measles Epidemic at Lang-ki: A report from Lang-ki in Anhuei, dated December 30, and appearing in the *North-China Daily News* of January 11, was to the effect that "a terrific epidemic of a virulent kind of measles" was carrying off children by the score in that city. Whole families were reported as dying off.

Italian Doctor Investigating Typhus in Shansi: A *Reuter* message from Peiping dated January 10 stated that Signor Ugo Cappuzzo, M.D., honorary physician to the Italian Embassy, had left Peiping for Shansi with a view to carrying out researches into typhus fever in relation to prophylactic vaccinations

with a new vaccine prepared in his laboratory. Good results had already been secured with this preparation in Peiping.

Shanghai Japanese Clinic Kept Busy: During 1935 the clinic maintained in Shanghai by the Japanese Residents' Corporation gave medical treatment to 25,260 cases, at an average cost of 93 cents a patient. The clinic was open for 302 days during the year, giving treatment to an average of 83 persons daily.

The heaviest month was August, when 2,754 patients visited the clinic, says a report in the *North-China Daily News* of January 16.

A. de C. S.

SHOOTING AND FISHING NOTES

SHOOTING

Trapping Methods Employed in China: The torture of fur-bearing and other wild creatures caught by man in various ways to supply his desires is a subject that must always exercise the minds of those who abhor cruelty to dumb animals. It is seldom that anything in the way of a merciful trap is used by professional hunters, whose aim, of course, is to secure their quarry by the most certain means with the least trouble to themselves. This is just as true of China as it is of any other country and calls just as much for the attention of the authorities and the passing of laws designed to ameliorate the sufferings of these wretched victims to man's greed and callousness.

While the Chinese hunter does not possess some of the vile contraptions,

such as the steel-jawed toothed jins employed by his American and European colleague, he has devised many brutal methods of capturing wild animals that are just as bad in their way. One of the worst of these is the foot noose set in a runway and fastened to a bent-down sapling in such a way that, when the animal puts its foot into the fatal ring and springs the trigger, the noose tightens on its foot and the sapling straightens up, yanking the wretched animal into the air, where it hangs suspended by one leg till merciful death frees it from suffering. This inhuman trap is used extensively in Szechuan by hunters of the little musk deer. Besides the fact that it is brutal in the extreme, it is wanton and wasteful, for it catches female musk deer just as often as males,

and since the females have no musk pods they are of no value. They are usually dead by the time the hunters, going their rounds, reach them, so that they cannot be turned loose again. There is another bad thing about this particular type of trap, and that is that it catches other small deer, such as the tufted deer, as well as various other wild animals that are of little or no value to the hunter. Thousands of animals suffer the torments of this lingering death in Szechuan and neighbouring Tibet every year in order that my lady may enjoy her delicate and dainty perfume, for it is to secure the musk which is carried in a pod on the abdomen of the male musk deer and for no other reason that the hunters of Szechuan set these cruel nooses, and it is for the manufacture of perfume and for nothing else that musk is used.

In China a favourite method used by hunters in catching fur-bearing animals is one which involves the hanging of a cleverly made honey-coated bomb along the path used by the animal. No fur-bearing animal, practically all of which are flesh-eaters, can resist this tempting morsel, and the first one that comes along, whether a fox, a badger, a wolf, a bear or a tiger, after a bomb has been hung out, seizes it in its jaws, and, as it bites on it, it explodes, shattering the animals jaws and only sometimes killing it instantly. All too frequently, especially if the animal be a large one, it goes away with broken jaws to die a lingering death in the jungle, not even serving the purpose for which it has been so brutally done to death.

Poison, too, is a favourite method employed by Chinese hunters to capture fur-bearing animals; and it may be said at once that there is no poison that can be effectively used for this purpose that does not cause severe agony to the victim, often prolonged for hours.

According to the Chinese game laws both the use of bombs and poison are illegal, but in the wilder parts of the country, where alone fur-bearing animals are to be secured, there is no provision made to enforce these laws.

More merciful means employed by Chinese hunters are the deadfall and the trap-gun, which usually kill the animals instantly. The former consists of a heavy log raised from the ground in such a way as to fall on the quarry when it releases a cleverly set trigger. This method is extensively used in the

Manchurian forests where there are many kinds of fur-bearing animals. The trap-gun is, of course, a loaded gun set at the side of some animal runway in such a way that it is fired as the animal presses against a string stretched across the runway. This method is extremely dangerous to human life, since there is no telling when a man, woman or child may not walk along the path on which it is set, and, of course, get shot, usually in the legs, since the gun is set at about the height of the quarry's heart, which is usually not more than a couple of feet from the ground.

A variation of this method is a spear, usually poisoned, so set that when a rope stretched across a path is pressed the spear is driven into the animal.

The bomb method of killing wild animals is extensively employed in Fukien and South China generally, as also is the spring gun and the poisoned spear or arrow. It is a favourite method with Korean hunters in both their own country and Manchuria.

Throughout the area between the Yangtze and the Chien-tang Estuaries, that is to say, the great Kiangsu and North Chekiang plain, as well as in the hilly mountainous areas of the latter province, the farmers catch small fur-bearing animals, such as minks, civets, badgers, raccoon dogs, foxes and even hares by means of cleverly constructed box-traps or tunnel traps. These are usually set between one field and another and have a wooden or stone door at either end so poised that when a trigger is released inside the box by the passage of the animal the doors simultaneously slip down into grooves and trap the quarry. Pheasant are often caught this way. Except for the fear engendered in the victim when it finds itself trapped and awaiting death, this is not a particularly cruel method of capturing animals.

The foregoing remarks have been called forth by the receipt of a pamphlet from the Shanghai Society for the Prevention of Cruelty to Animals entitled "Some Facts About Furs," and published in America with a view to rousing public opinion against the use of steel traps, which are without doubt the very height of cruelty.

Tiger Trap Tragedy in Kuangsi:

As an example of the danger to human life of traps set for wild animals along paths used by people comes a poignant

story from Wu-chou in Kuangsi, South China, telegraphed from Hongkong by *Reuter* on January 10. It seems that Mr. Fei Hsiao-tung of Yenching University, Peiping, was travelling with his wife in the Yao Mountains while engaged in sociological work in Kuangsi, when he stepped into a tiger trap, sustaining serious injuries. Mrs. Fei left her husband in order to secure assistance, but on the way she fell into a mountain torrent and was drowned. Mr. Fei was finally rescued, but at the time the telegram was sent was lying in a hospital at Wu-chou in a serious condition. The message does not state what type of trap was involved, but, another account in the *North-China Daily News* of January 20 says that it was a dead-fall. It seems that tigers and wild boar had become very numerous in the region, and the hunters of the Yao tribes had been busy setting traps for the pests.

It would be interesting to know if any kind of warning had been placed along the path where the trap had been set by the hunters. If not, the latter should be apprehended by the local authorities and severely punished.

A Man-eating Tiger Killed in Manchuria: Another recent *Reuter* message, this time from Harbin, Manchuria, describes the killing by two Russian hunters, J. Shavrin and K. Nazarenko, of a large tiger in the wilds north of Muling, a station on the eastern section of the North Manchuria Railway (formerly known as the Chinese Eastern Railway), which had been terrorizing the countryside to such an extent that the local lumbermen had at last refused to go out into the forest to work.

It was reported that during the past three months the tiger had killed more than twenty lumbermen and farmers.

While tigers are well known in the forested areas of Manchuria, and every year two or three are killed by Russian and Chinese hunters, this is only the second case that has come to our notice of a tiger in this region turning man-eater. The other instance dates back to the period when the Chinese Eastern Railway was being built, the story being that tigers began killing and carrying off the Chinese coolies employed on

construction work, finally becoming so bad that the coolies went on strike and refused to work. A regiment of Cossacks was sent to the scene and proceeded to hunt down the tigers, after which work was resumed with the soldiers acting as guards.

A Monster Tiger Killed Near Wei-Sha-ho: Yet another *Reuter* message from Harbin, dated January 20, describes the shooting by a Russian hunter named S. Kalugin of a 400 lb. tiger in the Wei-sha-ho district on the eastern section of the North Manchuria Railway, for which he was paid \$1,300 from a Chinese medicine shop. The tiger was tracked down and held at bay by the hunter's dogs till it was despatched with a single shot from Kalugin's rifle.

This winter's unusually severe weather has probably had something to do with the appearance of the two tigers mentioned above, intense cold and heavy snow causing these animals to lose some of their usual caution and fear of man, so that they are more easily located.

The Kowloon Tiger Seen Again: According to the *Hongkong Daily Press* one of the tigers that have been causing so much excitement in the New Territories on the mainland opposite Hongkong of late was seen again early in January, this time by Private F. A. Hall of the Royal Army Medical Corps, who was out collecting mosquitoes near Lion Head Farm. Neither the tiger nor the entomologist waited to improve their chance acquaintance.

Wild Boar and Deer in Shansi: Mr. Dwight Edwards and his son, Dwight Jr., while on a visit to Mr. and Mrs. R. Moyer at T'ai-ku Hsien in Shansi, took the opportunity of doing a little hunting in the mountains to the west of the Tai-yuan Fu plain, returning after a successful trip with three wild boar and nine roe deer. The party were away from Peiping from December 27 to January 4, says a brief note in the *North-China Daily News* of January 13.

It may be noted that the mountains of Shansi offer what is probably the best wild pig, roe deer, pheasant and partridge shooting to be had in China to-day.

FISHING

Chinese Fresh-water Fish: A news item that may prove of interest to anglers in China concerns the delibera-

tions that are proceeding at the Ministry of Industries with regard to the development of China's fresh-water fishing in-

dustries. The question of protecting and breeding fish as a preliminary step toward the development of this important industry is now under consideration; and if anything comes of the discussions we may hope to find in the not too distant future the inland waters of China stocked with fish of a size worth angling for. Mr. Chen Mou-lang, technician of the Ministry, has, it seems, been making investigations in collaboration with the Department of Reconstruction of the Chekiang Provincial Administration, and has recently returned from a tour of investigation through the valley of the Chu Kiang, or Pearl River, and the Yangtze Valley with a report listing various recommendations for the protec-

tion and breeding of fish. He points out that no protection of the fry of various species of fresh-water fish is afforded by local authorities and also that the methods of breeding and rearing fish employed by the farmers leave much to be desired. Mortality amongst fish fry while being transported from the hatching grounds in the south to various places throughout the country is very high, and the price demanded for the fry is also excessive. By instituting proper research and passing adequate regulations, the whole fresh-water fishing industry could be greatly improved—and, of course, anglers might have a better chance of catching good sized fish.

A. de C. S.

THE KENNEL

Just Retribution: A German resident of Kobe is reported by the *Japan Chronicle* recently to have received what can only be called just retribution when he found his house had been burgled during the night after he had beaten his little dog because it would not stop barking. It is sad to think how stupid human beings are when it comes to understanding what their canine associates are trying to tell them. The dogs are often blamed for making a stupid fuss about nothing, but nine times out of ten they are doing their best to communicate something of importance to their masters, and it is their masters who are stupid in not grasping the situation and trying to un-

derstand the dogs.

A Man and His Dog: How much more appealing is a story that comes through *Reuter's Agency* from Greenville, South Carolina, which tells of the heroism of a dog in running into a burning house to warn the inmates, all of whom were thereby saved. Unfortunately the dog got trapped in the burning building, whereupon his master, a Mr. Boyce Hughes, plunged back into the flames to save his dog, neither the man nor the dog being seen again. A man who will give his life for his dog is something above the average, though practically any dog will give his life for his master.

THE GARDEN

February in the Garden: Like January the month of February in the garden is a bleak one. There is literally nothing to gladden the eye unless it be the first green tips of the shoots from various early blooming bulbs. Snowdrops, for instance, show a full inch above ground now, having pushed through the soil during the latter part of January. If mild weather prevails crocuses may be in bloom by the end of the month, but mostly everything is bare and brown.

However, on certain days there is a distinct hint of spring in the air, and soon one begins to notice the swelling buds on jessamine and japonica, the earliest shrubs to bloom. In a corner of one's garden these two grow side by side and make a delightful bit of colour in due season, brilliant red and bright yellow.

The garden should now be thoroughly cleaned up ready for spring, when, if ever, it should look neat and tidy as the young plants put forth their shoots

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and buds. The final crop of dead leaves littering the ground under trees and shrubs should be gathered up and thrown on the pile in a corner, there to rot for leaf-mold to be used when potting plants later in the season.

A top-dressing on the lawn may not be out of place, though this should have been laid earlier in the winter. Very

soon violets will begin to appear amongst the dry grass-blades.

Those who have not got their seeds sown should get busy on this at once if they do not want to wait too long for their early flowers and vegetables. Frames in the open, or boxes in the hot-house may be used.

SOCIETIES AND INSTITUTIONS

THE ROYAL ASIATIC SOCIETY, NORTH CHINA BRANCH

Lectures During January: The members of this Society listened to two very interesting lectures in January, the first delivered by Dr. Kiang Kang-hu on January 9, his subject being "Cultural Relations between China and the West." This being too great a subject to cover in a single lecture Dr. Kiang said he would discuss the cultural relations that had existed between America and China under his own observations, from the time when he had to leave Peking for the United States as a young man because of his political views, and that when he finally left McGill University a year or so ago after having lectured there on Chinese literature and history. When he first went to America there was practically no interest taken in Chinese literature or history in the universities of the country, and few libraries had any Chinese books. He donated his own extensive library to San Francisco, later cataloguing a rather large collection of Chinese books in the Library of Con-

gress. This had since grown to considerable proportions. He later assisted in organizing and cataloguing the famous Gest Library of Chinese works in McGill University. When he left America, he said, a large proportion of the universities had Chinese libraries and in one way or another showed a keen interest in Chinese culture.

The second lecture during the month was a fascinating one delivered by Mr. Ernst Schafer of the Brooke Dolan Expedition to the Sino-Tibetan border regions entitled "The Natural History of Eastern Tibet." It was illustrated with a remarkable series of lantern slides showing all manner of wild animals secured and photographed on the expedition, reported elsewhere, of which he was chief naturalist. The main theme of the lecture was the way in which several well defined faunistic regions meet and even overlap in Eastern Tibet, which is one of the richest areas in Asia from the zoologist's point of view.

THE GEOLOGICAL SOCIETY OF CHINA

Annual Meeting held in Nanking: The twelfth annual meeting of the Geological Society of China was held in Nanking from January 26 to 30, when Dr. Wang Wen-hao, former director of the National Geological Survey and now Secretary-General of the Executive Yuan, Dr. Yang Chung-chien and Dr. Huang Chi-ching were elected to the Board of Directors. In commemoration of the late Dr. V. K. Ting, one of China's

leading geologists, it was decided to establish a V. K. Ting Fellowship to be awarded to worthy students engaged in geological research. Papers were read by various members of the Society. These will appear in due course in the *Bulletin of the Geological Society*. The meetings were held in the new building of the National Geological Survey of China at 942 Chukiang Road, Nanking.

THE NUMISMATIC SOCIETY OF CHINA

Medallions Exhibited at Monthly Meeting: The members of the Numismatic Society of China enjoyed a rare treat when they were shown at

the Society's regular monthly meeting on January 14 a collection of exquisitely beautiful modern medallions brought from Europe by Mr. R. F. Mulder on

EDUCATIONAL NOTES AND INTELLIGENCE

his recent return to China after several months' absence. Several of these had been acquired at by Mr. Mulder at the World Exposition in Brussels, others were purchased in Vienna. These represented the work of Austrian and Czecho-

slovakian artists, and amongst them were some really remarkable miniature plaques of early Czech kings by Sucharda, as well as one by Placht showing Bishop Frind, and another by Neuberger of St. Stephan's Church in Vienna.

THE SOCIETY OF GERMAN SPEAKING PHYSICIANS

An Interesting Lecture on Peking Man: Under the auspices of this Society Dr. F. Weidenreich, who has succeeded the late Dr. Davidson Black at the Peking Union Medical College, delivered a fascinating lecture on Peking Man, known to science as *Sinanthropus pekinensis*, at the Henry Lester Institute on January 17. The lecture was entitled "Sinanthropus Pekinensis and His Anthropological Significance" and was devoted mainly to a discussion of the teeth and jaw formations of Peking Man, as shown by the many relics found at Chou-kou-tien near Peking, in comparison with the teeth and jaws of the anthropoid apes, modern man and other prehistoric hominids. One of the most interesting points made by the lecturer was that the jaw and certain of the incisor teeth of Peking Man show

characters found only in present day Mongoloid races, suggesting that he was in the direct line of ancestry of the latter. So far only parts of the skull and teeth of *Sinanthropus* have been found, and these are all of juveniles or young adults, facts which suggest that the owners of the skulls might have been used as food. Although extremely primitive and at about the same stage of development as the so-called Java Ape-man (*Pithecanthropus erectus*), Peking Man had already developed the use of fire and crude implements. Of one thing the lecturer was satisfied and that was that *Sinanthropus* was a true man and not an ape.

The lecture was illustrated with a number of very interesting lantern slides.

EDUCATIONAL NOTES AND INTELLIGENCE

Higher Learning Institutions in China: According to statistics issued by the Ministry of Education recently there are forty-two Universities, thirty-eight independent Colleges and thirty-one Technical Colleges in China, making a total of one hundred and eleven institutions devoted to higher learning. They are scattered all over the country, though the majority are in Shanghai and Peiping, where there are twenty-seven and sixteen, respectively. Shanghai, it may be noted, leads the whole of China as an educational centre.

Plans for a Thousand New Primary Schools: A report from Foochow is to the effect that Mr. Hu Wen-hu, the multi-millionaire medicine merchant of Singapore and well known philanthropist, has plans for the endowment of a thousand new Primary Schools in China during the next ten years.

Revision of Text Books Protested:

In response to the Japanese demand that all text books used in Chinese schools shall be revised and anti-Japanese material expunged, the school teachers of Hopei Province have issued a long manifesto protesting against the revision, and stating that this would only further rouse the indignation of the students of China and aggravate the present trouble. The manifesto also points out that these text books have been specially prepared to revive the Chinese race, and, therefore, should not be revised.

Students Demonstrating throughout

China: In many parts of the country education was completely disrupted during December by demonstrations on the part of the students in colleges, schools and even universities, these taking the form of parades, mass-meetings, and attempts to reach Nanking to protest to

the Government against the establishing of an autonomous state in North China. Demands for free transportation from Hangchow and Shanghai to Nanking, led to the temporary discontinuation of the train services on the Nanking-Shanghai and Shanghai-Hangchow Railways just before and

during the Christmas holidays. Many educational institutions were forced to declare holidays early in December owing to the non-attendance of students, who were out demonstrating. Fortunately no serious untoward events have occurred, and the demonstrations have now died down.

PUBLICATIONS RECEIVED

BOOKS:

Background to Chinese Painting, by Soame Jenyns: Sedgwick & Jackson, Ltd., London.
The Chinese Year Book 1935-36, Edited by Kwei Chungshu: The Commercial

Press, Limited, Shanghai.
Modern Newspaper Chinese, by J. J. Brandt: Oriental Bookstore, Peiping.

PERIODICALS:

New Zealand Journal of Science and Technology—China Highways—Philippine Journal of Science—Hongkong Naturalist—Ericsson Review—Natural History—Lloyd Mail—Journal of Bombay National History Society—Man—Shipping Review—Chinese Economic Review—Smithsonian Miscellaneous Collections—Yoga—The Chinese Student—Salmon and Trout—Musee Heude—Science—Insekto

Interesa—T'ien Hsia Monthly—Nankai Social and Economic Quarterly—People's Tribune—Journal of Shanghai Science Institute—Chinese Digest—Chinese Social and Political Science Review—Week-end—Journal de Biologie—Chinese Economic Journal—Travel in Italy—La Revue National Chinoise—Oriental Affairs—Geographical Review.



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Black, Teilhard, Young & Pei: **Fossil Man in China.** \$5.00. With a good synopsis on the geology of Late Cenozoic era in China. Profuse illustrations on Sinanthropus and associated fauna.

W. C. Pei: **Choukoutien excavations.** \$2.00. Detailed account of the practical experience at Choukoutien where Sinanthropus was discovered.

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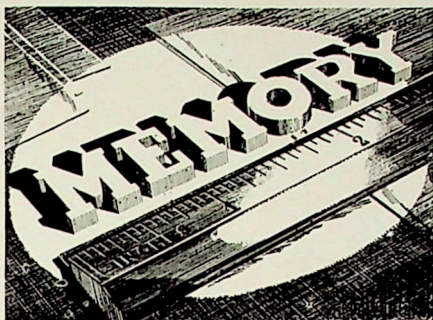
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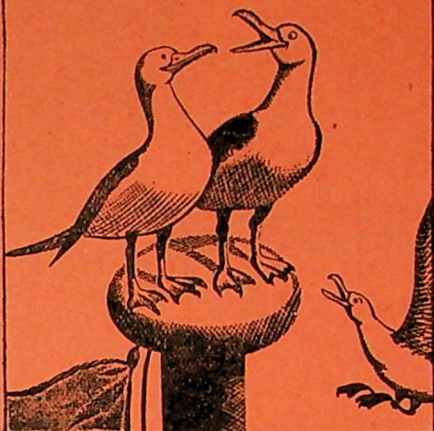
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