
THE
CHINA JOURNAL
中國科學美術雜誌
SCIENCE
ART
LITERATURE
TRAVEL
SHOOTING
FISHING
PRICE $1.00 MEX.
Vol. VI
APRIL 1927
No. 4

THE CHINA JOURNAL

中國科學美術雜誌

Editors : ARTHUR DE C. SOWERBY, F.Z.S.
JOHN C. FERGUSON, PH.D.
Manager : CLARICE S. MOISE, B.A.
Secretary : NAN L. HORAN
Assistant Editor : MARIAN ROCKWELL

[ENTERED AT THE CHINESE POST OFFICE AS A NEWSPAPER]

VOL. VI APRIL, 1927 No. 4

CONTENTS

Contributions of a suitable nature are invited and all MMS. not accepted for publication will be returned.

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

The subscription for the year (twelve issues) is $10.00, Shanghai currency or its equivalent. In the U.S.A. and Canada, Gold $6.00 ; in Great Britain and Europe, 25/–. Postage free.

Crossed cheques (Shanghai currency or P. O. O. should be sent in payment of the annual subscription from Outports, Europe and America direct to the Manager.

Office : 8 Museum Road, Shanghai, China.

PRINTED BY THE NORTH-CHINA DAILY NEWS AND HERALD, LTD., FOR THE PROPRIETORS

Classified Index of Advertisers

(Continued on next page).

Classified Index of Advertisers (*Contd.*)

Readers of "The China Journal" are specially requested to make enquiries of the above firms when contemplating making purchases of articles or commodities mentioned in the advertisements, and if possible, to purchase from our advertisers.

Advertisers, Journal and Readers form a circle of mutual interdependence and co-operation. Do not break the circle.

Willard M. Porterfield, M.A., Professor of Biology at St. John's University, Shanghai

THE CHINA JOURNAL
中國科學美術雜誌

VOL. VI APRIL 1927 No. 4

"GIVE US MEN"

BY

ARTHUR DE C. SOWERBY

In the chaos into which China has fallen, one thing stands out with startling clarity, and that is the comparative lack of the right kind of leader. Almost every other country which has been thrown into a state of political upheaval in response to the powerful revolutionary forces—commercial, industrial, economic and social—that are sweeping the world to-day has its great men, men of high integrity who are not to be bought, men of moral courage who are not afraid to go against the current of misled popular opinion, men of determination and a strong sense of duty to their country who do not consider their own interests above all else, men of keen intelligence who are not deceived by the parrot cries and slogans of alien conspirators and native malcontents, men of constructive and administrative ability who will lead their fellow nationals out of the prevailing welter of intrigue and political turmoil to a condition of strong and stable government, peace and commercial prosperity.

In China to-day, though many a figure looms large on the political horizon, these, almost without exception, are militarists who have attained their powerful positions through corruption and intrigue, not through force of character, and whose interests are entirely selfish. It is not meant to suggest that there are no good men in China, that integrity and self-abnegation do not exist, that love of country is dead; far from it. There are good men and true in China, there are men of intellect and training, but for some reason they seem to be very backward in coming out into the open and making their voices heard.

One frequently hears it stated, and indeed, it is only too true, that one of the chief causes of discontent on the part of the rising generation of intellectuals in China is that after having received a first-class education either at home or abroad, and having attained high scholastic honours, they find no position in China to-day compatible with their qualifications. These young men return from Europe or America or Japan full of enthusiasm and high ideals, full of a desire to be of service to their country. Amongst their ranks are engineers, chemists, biologists, physicians, social and political economists, and few of them come back with less than a doctor's or master's degree. The Science Society of China boasts something like five hundred members, all of whom have taken doctors' degrees in some branch of science. Where are they all ? What are they doing ? The fortunate amongst them have secured professorships or teaching positions in various educational institutions where they can serve their fellow countrymen in the lines along which they have been trained. The rest are either doing nothing or are eking out a meagre existence in minor positions in native schools or as petty clerks in foreign firms. Sooner or later they join the ranks of political parties and take up the cries of the abolition of treaties and extraterritoriality and the rendition of foreign concessions, thinking that so will they overcome the evils that beset them.

Why do they not go ahead and create positions for themselves, as would undoubtedly be done by British, Americans or Germans of equal training under similar conditions ? They seem to sink back into the inertia of the Orient and drift with the tide. They dare not, apparently, come out into the open and face the militarists that are ruining the country with their crimes ; or, if they do, it is not infrequently to take part in riotous demonstrations, egged on by communist agitators, which, naturally, are ruthlessly quelled by the powers that be.

Why do not these men who have received the benefits of Western training, and who have been instructed in Western ideals, set about the task of moulding public opinion in China against the corrupt practices of those in high places ? Why do they not band themselves together for constructive work and make their united voices heard in the land ? They know that the strength of Western nations is founded on the integrity of those in high places : why do they not demand the same in China ?

Nowhere in the world is the need for men of strength and character so great as in China, and until that need is met, until the young men of China to-day, those who have received the right training, have the courage to come out wholeheartedly on the side of right and truth and justice, there is little hope for the country they love.

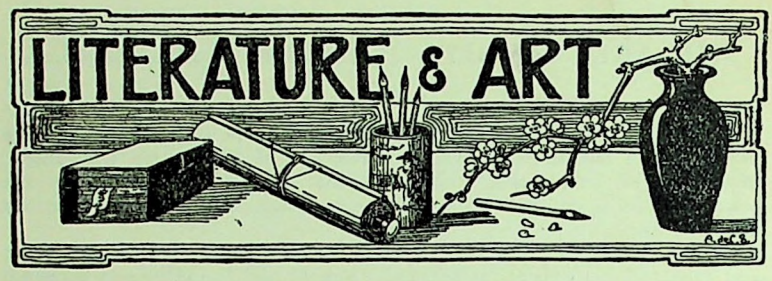
WILLARD MERRITT PORTERFIELD, JR., M.A.

One of the most consistent contributors to *The China Journal* since its inception has been Professor Porterfield of St. John's University, Shanghai, whose articles upon botanical subjects, and especially his contributions upon the subject of the bamboo, will be remembered by our readers.

Willard Merritt Porterfield, Jr., was born in Harrisburg, Pennsylvania, and received his education at Yeates School and Franklin and Marshall College, Lancaster, Pennsylvania, after which he took an intensive course in plant ecology at the Cold Spring Harbour Marine Biological Laboratory, Long Island, followed later by a summer's term at Harvard, and then a year's teaching at Racine College, Wisconsin. In 1916 he came to China and successfully took up the task of developing the Biology Department of St. John's University as a separate department of the School of Science. In 1918 he became a member of the Botanical Society of America and a year later a fellow of the North-China Branch of the Royal Asiatic Society. When on furlough to the United States in 1921 he took post-graduate work toward a Ph. D. degree at Columbia University, and while there became a member of the Torrey Botanical Club, one of the societies affiliated with the New York Academy of Science.

Returning to China the following year Mr. Porterfield received the professorship of Biology at St. John's University, which post he still holds. He is a member of the China Society of Science and Arts, being secretary of the Biology section, a member of the honorary scientific society Sigma Xi, Columbia Chapter, in the United States, and was recently admitted to the American Association for the Advancement of Science.

Professor Porterfield has contributed numerous articles to scientific journals and is the author of a short monograph containing a preliminary study of "Bamboo and Its Uses in China." His work in China apart from his duties as a teacher at St. John's University has consisted mainly of botanical research. The bamboo plant has been his chief subject of study and experiment. In this line his many publications testify to the excellence of his work. He is, besides, a keen student of heredity and the various theories and laws connected therewith, while his knowledge of biometry and its application has rendered his botanical research work extremely sound.



MEI LAN-FANG IN THE ROLE OF YANG KUEI-FEI

BY

SHU CHIUNG

(MRS. WU LIEN TEH)

Of all the actors that China has produced in her long history, the best known to the public is undoubtedly Mei Lan-fang, the female impersonator. And this is not all due to twentieth century publicity or association with powerful official patrons, for this talented actor, like other apprentices, went through the regular mill from childhood, and emerged as a master in his profession.

Those who are in any way familiar with northern Chinese acting know that it is in many respects a very stereotyped affair, with little chance for initiative or individuality except perhaps in the matter of singing. For instance, a virtuous wife must be portrayed by the *ching-yi* (青衣) type who, as soon as she stands before the curtain, must look demure, appear somewhat stooped, be simply dressed, walk with a slow studied step and sing with as few changes of facial expression as possible. On the other hand, the part of a mischievous maid-servant must be acted by a *hua-tan* (花旦) attractively clad in dashing colours, ever restless, now swinging her body, now biting her pink handkerchief, and displaying marked animation both in speech and action. In other words, the *ching-yi's* art is to sing, while that of the *hua-tan* is to act, and incidentally to attract.

Mei Lan-fang began his stage career as a *ching-yi*, always sedate, often simple and frequently sorrowful. Such parts as the suffering lonely widow teaching her foster, and not too obedient, son, in *San Niang Chiao Tze* (三娘教子), and the persecuted ex-courtesan singing on her knees for one full hour as she is examined and cross-examined by her three judges (one of whom is her faithless husband) in *Yu T'ang Ch'un* (玉堂春), came naturally to him ten years ago.

But Mei Lan-fang was not content to follow blindly the traditions handed down for decades. Because when made up he could look uncommonly pretty as a girl, he also tried the part of *hua-tan* in *Ch'un Hsiang Nao Hsueh* (春香鬧學), where the naughty slave-girl continually teases the family teacher, and in *Yu Lung Hsi Feng* (遊龍戲鳳), where the maid of the wine-keeper's inn makes love to a diguised emperor and eventually becomes his concubine, with such marked success that he soon evolved the joint part of *ching-yi-hua-tan* (青衣花旦) requiring an actor to possess an attractive appearance, as well as ability in acting and a pleasing voice.

Hence were devised such presentations as *Tien Nu San Hua* (天女散花), A Fairy Scattering Flowers, and *Tai Yu Chung Hua* (黛玉葬花), where the love-sick heroine of the famous book called "Dream of the Red Chamber" (紅樓夢) buried flower petals as an emblem of her shattered hopes. In each of these plays, Mei Lan-fang introduced a new head-dress and flowing silken robes modelled after the ancient Han style. The effect was almost magical. Throughout the length and breadth of the land, hundreds of actors and actresses adopted the new mode, singing and dancing in the new way, and even in distant Canton the famous actress, Li Hsueh Fang, included in her repertoire several of Mei Lan-fang's masterpieces.

As our gifted northern impersonator found his progressive methods more and more appreciated by the general public, he gradually introduced new features on the Chinese stage, such as modern scenery, projecting arc lights, improved orchestra and even choruses. The results are seen in his recent productions of *Hsi Shih* (西施), one of the four famous historical beauties, and *Yang Kuei-fei* (楊貴妃). The presentation of the latter play, known here as *T'ai Chen Wai Chuan* (太眞外傳), in four acts is in such close harmony with my book that it may almost be called a stage adaptation of the same. I have seen all the four acts (each being acted on a separate night) and herewith supply my humble review of this climax of Mei Lan-fang's dramatic achievements.

Act I opened with the heroine in the costume of a royal nun (distinguished by the yellow tassels at the back of her hair) secluded in the garden of T'ai Chen Palace (太眞宮) of the Emperor Ming Huang. As she sang, in came the emperor who made love to her and adorned her hair with some flowers he had plucked. Later on, she was publicly acclaimed in the Phoenix Hall (鳳園) as the "exalted imperial concubine" (貴妃). The staging here did not do justice to the grandeur of the occasion. Then came the bath scene at Hua Ching Palace (華清宮), where the devoted royal lover from a secret spot watched his matchless beauty scantily clad as she hummed and danced in the marble-lined pond. The orchestral music accompanying this rare scene was mainly the actor's own modification of the *kung* (崑腔) variety and was much appreciated. The last scene where Yang Kuei-fei appeared in full court regalia before the emperor and gorgeously dressed attendants was quite picturesque, but Mei Lan-fang added an unnecessary long, Western style train to his artistic Chinese imperial garments, thus introducing an incongruous

element in the culture of the T'ang period, when Chinese civilization, including music, reached its acme of perfection.

Act II dealt principally with pleasure scenes at Ch'eng Hsiang T'ing (沉香亭), Pavilion of Heavy Fragrance, where, among other incidents, the famous poet Li Po was brought in, and though much intoxicated was continually provided with wine by his imperial host in order that he might turn out with his brush immortal verses for the edification of the reigning beauty. This scene best portrayed the character of Ming Huang, for he agreed to all the whims and fancies of the poet, even to the extent of commanding his proud favourite to hold the ink-slab, and the powerful eunuch, Kao Li Shih, to kneel down and pull off Li Po's boots so as to ease his feet while writing. At ordinary times, such impertinences from a mere subject, however gifted, might have meant instant decapitation ; but the poet, because he still possessed a clear brain in spite of liberal draughts of wine, managed to revenge himself upon the eunuch for a previous slur upon his literary ability. Act II also included Yang Kuei-fei's disgrace and expulsion from the Palace, which in my opinion was too long drawn out. However, the final scene, representing the dream of the emperor while longing for his favourite's company, made up for this defect. In that dream, Kuei-fei showed herself in a half-clouded atmosphere as a fairy, attended by four others equally lovely in snow-white costume, who sang and danced for half an hour to the accompaniment of ancient music. Towards the end, their white dresses were suddenly reversed to a golden brocade and the stage fully illuminated to remind the love-sick sovereign that his consort and maids had returned and were ready to attend to all his imperial needs.

Act III began with a scene showing the struggle for power between Minister Yang Kuo Chung, Kuei-fei's foster brother, and General An Lu Shan, her secret lover, whose make-up was too fierce to appeal to any woman. In this struggle the Tartar lover lost and was sent with a large army to take charge of a distant post. The most dramatic scene, however, was one at midnight in the quiet garden of Hua Ch'ing Palace (清華宮) where the royal couple, after years of almost uninterrupted love, made their vow at the Hall of Immortality (長生殿) to live and die together. It was the seventh eve of the seventh month, when the crescent-shaped moon shone in the distant sky and the stars reminded the lovers of the legend in which the fairy weaving-maid was permitted only once a year to meet her herdboy spouse. In this pretty scene Mei Lan-fang as Kuei-fei danced and sang with unusual grace in richly embroidered robes. As she reached a golden basin the imperial concubine raised her sleeves and dipped her hand in the water, calling her waiting maids to watch the moon's reflection in the water. For a Chinese play, the staging of this part was most pleasing and sentimental. The last scene in the act showed the celebration of Kuei-fei's birthday when she danced on a round table decorated with a margin of king-fisher blue so cleverly arranged that as it revolved it created the illusion that the whole table was turning. The court musicians playing on their old instruments were assisted by sixteen youths carrying flags of four different colours, while

The well known Chinese Actor Mei Lan-fang in the Rôle of Yang Kuei-fei dancing in the Bathing Scene, Act I

the enchanted emperor sat on a raised dais in the centre keeping time with a drum. The curtain was lowered amid well-deserved applause.

In the final Act (IV) the disintegration of the Court was vividly pictured with revolt threatening from all sides. While feasting was at its height at Ch'ing Yang Palace (清元宮), a messenger brought tidings of the approach of the rebellious army at the gates of the capital. In vain did the emperor try to maintain his position. He evacuated his palace when danger was imminent, and at Ma Wei (馬嵬坡) was given the choice between love for Kuei-fei on one hand and safety for the dragon throne on the other. After much heart-searching, Ming Huang accepted the latter alternative and thus sacrificed his earthly happiness. The forsaken favourite now appeared in a white gown with her parted hair streaming down her shoulders, prostrated herself before the image of Buddha, and, after words of farewell to the faithful eunuch, hanged herself to the nearest tree. This tragic scene would have been more effective had not the old-fashioned pole tied to a chair been used. Evidently Mei Lan-fang's stage manager frogot the importance of this part, as he could easily have arranged for the tree to conform with the rest of the scenery. When the aged emperor returned from his exile in Sze-chuan, he ordered Kao Li Shih to search for Kuei-fei's grave, but the body was gone and only the girdle clasp and bracelet remained. The intense pathos shown at this moment by Chiang Miao Hsiang in the part of Kao Li Shih brought tears to the eyes of a considerable number of the audience, proving that this actor has greatly improved in his art during recent years. The last scene at the Isle of the Blest (仙山), where Ming Huang sought the spirit of his departed consort, was well staged, while the lightning effect during the dance of the immortals was unusually good.

Summarizing, I feel that Mei Lan-fang in his latest opera depicting the fascinating story of Yang Kuei-fei in four complete acts has indeed enhanced his reputation as an artist of unusual initiative and resourcefulness. When compared to Western stagecraft, perhaps the technique of scene-shifting and stage-lighting may be considerably improved, but after all we in China are more interested in the actor's skill in his art than in the mechanical contrivances of the stage, however up-to-date. Mr. Mei deserves every praise for his progressive ideas, and one hopes that his impending visit to America may result in a further broadening of his knowledge of modern drama, which has certainly reached a very high state in New York City.

NOTES ON THE MINTED COINS OF CHINA

BY

A. M. TRACEY WOODWARD, F.R.G.S., F.R.N.S.

"Care not for want of place: care for thy readiness to fill one. Sorrow not at being unknown, but seek to be worthy of note." Confucius. Book IV, § 14.

ARTICLE VI.

THE MINTED TEN-CASH PIECES FOR GENERAL USE IN CHINA.*

Our articles have so far covered the provinces reading alphabetically from A to F. The letter G is now reached which stands for various monarchical coins not bearing the sign or symbol of any particular province in China, notwithstanding that several mints, situated widely apart, have produced such coins. But the number produced is not large; indeed, it may fairly be assumed that the contrary is the case. No particular mint being specially designated, we can immediately proceed to consult our plate for the obverses.

A.—This bears the central characters 大清銅幣 (Tah Ch'ing T'ung Pien)† which belong to Section II, or the 'Tai Ch'ing Ti Kuo' series. It bears the year date of 乙巳 (1905). Circle consists of 91 beads.

B.—Similar to obverse A, but the characters are in a different calligraphy, particularly so the Manchu characters, as well as the year date of 乙巳. It is generally immediately identified by the two larger dots of the ideograph 清 (ch'ing). The beaded circle has 91 spots.

C.—Generally of the type of the foregoing, but with the year date of 丙午 (1906).

D.—Same as obverse C, but the characters are written in a different hand as shown by the easily recognizable differences in the character 部, and also in the Manchu characters.

*This term "for general use" has been adopted more in a figurative sense than as an actuality, for it is doubtful whether the striking of coins not bearing any mark of identification of any particular province in China was intended for the employment of those coins all over China; it was probably more as a matter of convenience combined with a possible desire to conceal the identity of the producing mint that the willful omission of the mint mark was resorted to.

†As no particular province is ascribed to these coins, it was inevitable that they all should bear the central characters 大清銅幣 (Tah Ch'ing T'ung Pien), with one exception only.

NOTES ON THE MINTED COINS OF CHINA

BY

A. M. TRACEY WOODWARD, F.R.G.S., F.R.N.S.

"Care not for want of place: care for thy readiness to fill one. Sorrow not at being unknown, but seek to be worthy of note." Confucius. Book IV, § 14.

ARTICLE VI.

THE MINTED TEN-CASH PIECES FOR GENERAL USE IN CHINA.*

Our articles have so far covered the provinces reading alphabetically from A to F. The letter G is now reached which stands for various monarchical coins not bearing the sign or symbol of any particular province in China, notwithstanding that several mints, situated widely apart, have produced such coins. But the number produced is not large; indeed, it may fairly be assumed that the contrary is the case. No particular mint being specially designated, we can immediately proceed to consult our plate for the obverses.

A.—This bears the central characters 大清銅幣 (Tah Ch'ing T'ung Pien)† which belong to Section II, or the 'Tai Ch'ing Ti Kuo' series. It bears the year date of 乙巳 (1905). Circle consists of 91 beads.

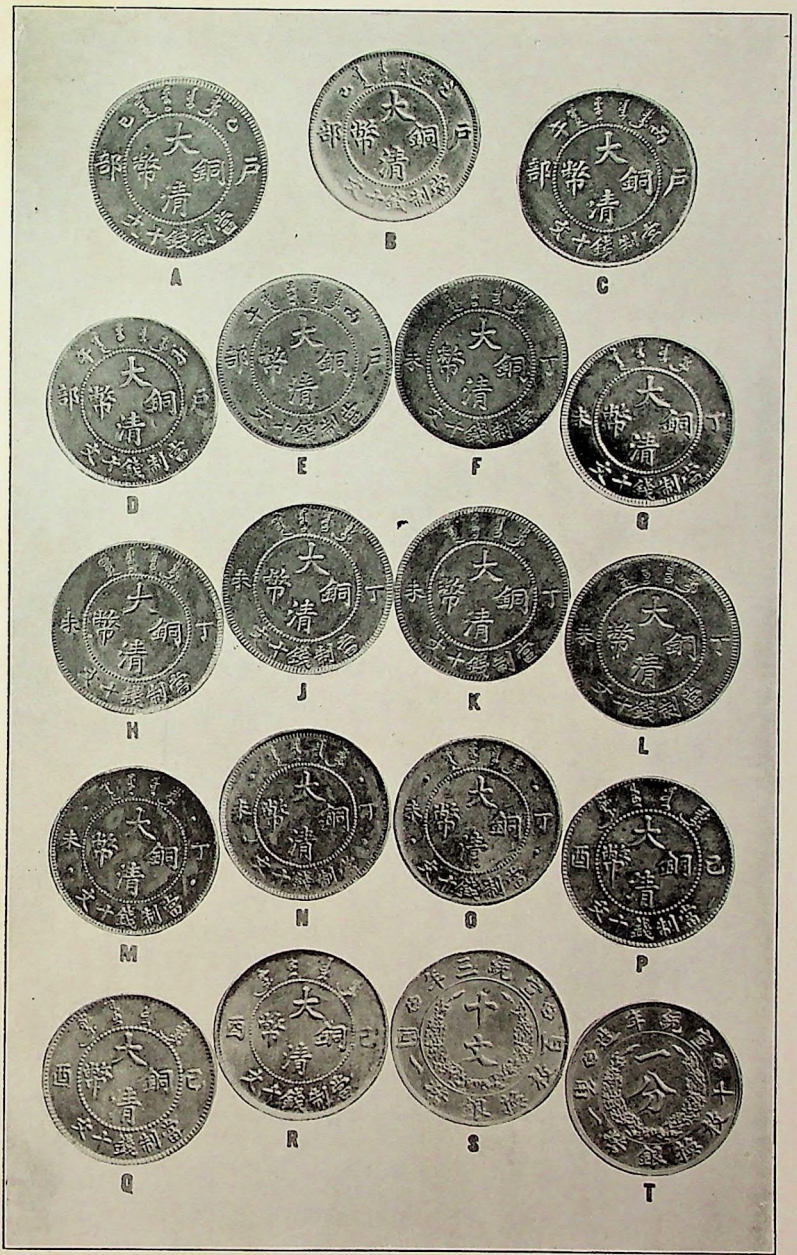
B.—Similar to obverse A, but the characters are in a different calligraphy, particularly so the Manchu characters, as well as the year date of 乙巳. It is generally immediately identified by the two larger dots of the ideograph 清 (ch'ing). The beaded circle has 91 spots.

C.—Generally of the type of the foregoing, but with the year date of 丙午 (1906).

D.—Same as obverse C, but the characters are written in a different hand as shown by the easily recognizable differences in the character 部, and also in the Manchu characters.

*This term "for general use" has been adopted more in a figurative sense than as an actuality, for it is doubtful whether the striking of coins not bearing any mark of identification of any particular province in China was intended for the employment of those coins all over China; it was probably more as a matter of convenience combined with a possible desire to conceal the identity of the producing mint that the willful omission of the mint mark was resorted to.

†As no particular province is ascribed to these coins, it was inevitable that they all should bear the central characters 大清銅幣 (Tah Ch'ing T'ung Pien), with one exception only.



Types of Obverses of Coins minted for General Use in China

E.—The same remarks noted for obverse D apply in the present instance. Note the width of the Manchu characters.

F.—Generally speaking of more or less similarity to the foregoing types, but dated 丁未 (1907).

G.—Quite similar to obverse F, but the characters have been written in a different hand.

H.—Much resembling obverse F, the characters, however, are again written by a different hand. Observe the curved slantiness of the upper stroke of the character 銅.

J.—Again similar to obverse F, but the die was designed by another hand.

K.—The remarks noted for obverse J also apply here.

L.—Once again as per the remarks for obverse J, thus making six varieties in all for this particular design.

M.—The general get-up appears to have been adopted from the designs of obverses F to L, but with the addition of four solitary dots in the field.

N.—Very similar to obverse M, but designed by a different hand.

O.—The remarks under obverse N also apply here. Attention may be drawn to the differences in the character 銅 in the three obverses M, N and 0.*

P.—A design showing good craftsmanship ; it bears the year date of 己酉, or 1909. Circle of 72 big dots.

Q.—Similar† to obverse P, but engraved by another artisan. The characters 製 and 幣 are fairly different. The circle consists of 72 big dots.

R.—Somewhat‡ similar to obverses P and Q, but the ensemble is seemingly put together in a more compact manner. The circle consists of 91 small dots.

S.—An entirely new and pleasing design with 宣統三年 (Hsüan Tung San Nien), denoting it to have been issued during the third year of the reign of Emperor Hsüan Tung, above, and 百枚換銀幣一元 (Pah Kueh Weh Ning Pien Ih Yuen) meaning "One hundred pieces (of) copper money (is the)

*The evidence so far revealed tends to prove that obverses A to O were produced by the mint at Nanking, otherwise known formerly as the Kiang-Nan mint.

†These two obverses P and Q were produced by the Kirin (Mukden) mint. From the fact that these two obverses first made their appearance during 1922, it may be safe to assume that the pieces bearing these obverses were minted during the republican régime, and even then not earlier than about ten years after this form of government had been instituted, thus revealing a latent desire to delude the people into the belief that these coins had been minted in the good old and reliable days when Imperial China's prestige was respected.

‡This obverse was minted at the Kiang-Nan mint of Nanking.

equivalent (of) one yuen," below. In the centre are the characters 十文 (Shih Wen) meaning "ten-cash."

T.—Somewhat* in the style of obverse S, but the four top characters now read: 宣統年造 (Hsüan T'ung Nien Tsoh) or "Made during the Hsüan T'ung period." Below, 十枚換銀幣一角 (Shih Kueh Weh Ning Pien Ih Chiao) which translates into "ten pieces (of) copper money (is the) equivalent (of one corner."†

There are sixteen outstanding reverses in all:

1.—This reverse bears a rather attractive dragon, and the English legend of "Tai-ch'ing-ti-kuo copper coin" is in fairly large letters.

2.—A different dragon from the preceding, with English legend in small letters. No spot between the words "kuo" and "copper."

3.—Much the same as reverse 2, but the waves underneath the dragon are different.

4.—The same remarks noted for reverse 3 are applicable here. The waves consist of three lines each. A spot between the words "kuo" and "copper."

5.—Again a different die, but resembling reverse 4. The waves are now made up of two lines each.

6.—A type that, notwithstanding its resemblance to the four foregoing reverses, is, nevertheless, easily recognized by the fullness of the engraving. Spot between the words "kuo" and "copper."

7.—In general much the same design as above described. Both eyes of the dragon consist of prominent circles.

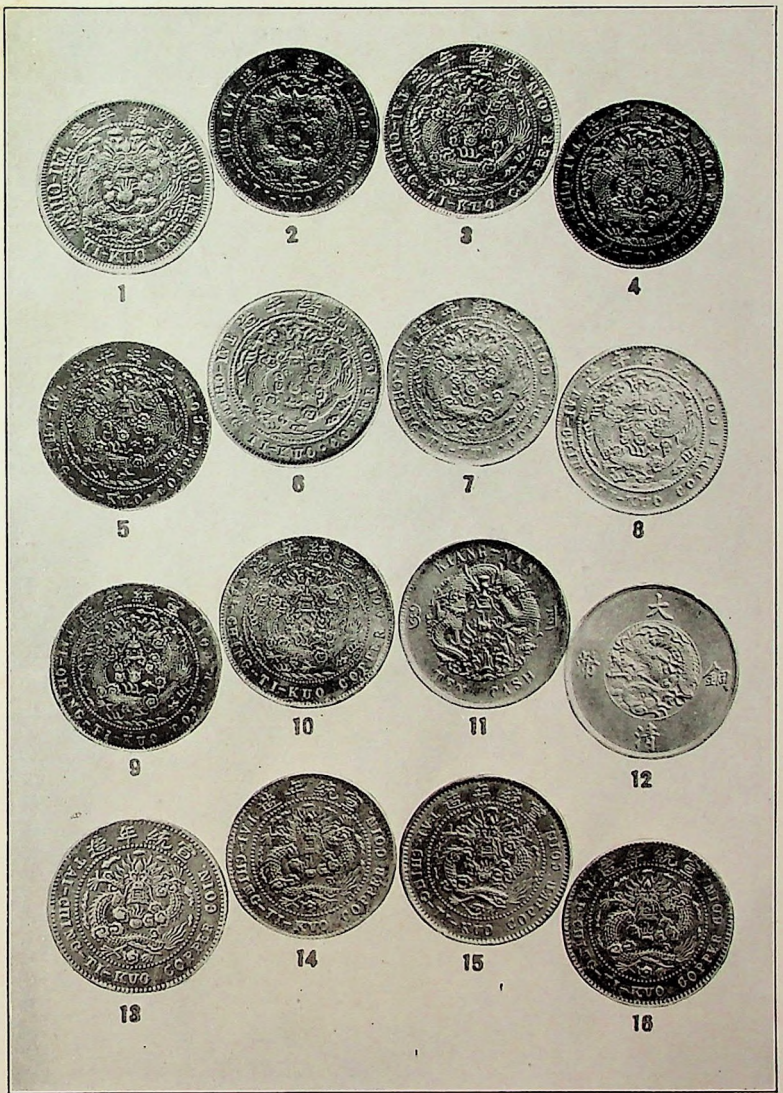
8.—Once again generally resembling reverses 2 to 7. Observe the waves that appear closely joined together. No spot between the words "kuo" and "copper."‡

---

*The two obverses S and T were produced by the Central Mint at Tientsin.

†A passing allusion to this character 角 or "corner" may be of advantage here. This word in connection with currency is always understood to mean the tenth of a dollar. Incongruous as it may sound, the interpretation of the words "one corner" to mean 10 cents is arrived at in the following ingenious manner. "The dollar, when divided into two quinquelineal sections thus:  will be found to exhibit ten sharp corners in the centre where the lines radiate, and to form ten somewhat triangular segments. Hence, one *chiao* or "corner" is a tenth of the whole (dollar). The character is generally preceded by a numeral, and then by the character 洋, meaning *yang*, or "foreign," the antonym of "native." The fact that the term is applied only to the 10 cent silver coin, and not to any equivalent in subsidiary copper coins, is thus explained, its significance being similar to that which is understood in Great Britain by the "thrup'nny bit," or in the United States of America by the "nickel." "A. M. Tracey Woodward *The Postage Stamps of Japan and Dependencies.*"

‡The beaded circle of reverses 2 to 8 have been religiously set at 120 dots.



Types of Reverses of Coins minted for General Use in China

9.—In most points similar to the foregoing, but the Chinese legend now reads 宣統年造 (Hsüan T'ung Nien Tsoh).

10.—Very similar to reverse 9, but the waves, clouds and Chinese characters are somewhat altered.

11.—A reverse which should really belong to the Kiang-nan Province series, but which is placed here because it appeared as a reverse to obverse N during the republican days of 1924.

12.—A very dignified design, showing repose combined with simplicity. It was made by the Central mint at Tientsin during the period when Mr. L. Giorgi was chief designer of that mint.

13.—This number represents the usual type of the "Tai Ch'ing Ti Kuo" series. Observe the terminal part of the dragon's tail.

14.—Similar to reverse 13, but the ornament underneath the end of the dragon's tail is altered. There is a dot underneath the chin of the dragon.

15.—In general appearance similar to reverses 13 and 14, but the ornament underneath the tail of the dragon is now more prominent, and reveals a distinct ball in its centre.

16.—Same as the preceding three reverses but with no ornament at all underneath the tail of the dragon. These four reverses 13 to 16 were produced by the Kirin (Mukden) mint.

The various combinations of the above obverses with the reverses have produced a list of the following known varieties :—

No.	Obverse		Reverse	Size m.m.	Average weight grains	Metal	Comparative rarity.
251	A	with	1	28.25	114.50	Copper	R.
252	A	,,	2	28.50	118.00	,,	C.
253	A	,,	3	28.25	111.25	,,	R.R.
254	B	,,	3	28.50	106.50	,,	R.
255	C	,,	3	28.50	114.50	,,	C.
256	D	,,	2	28.50	111.50	,,	R.
257	E	,,	3	28.50	117.00	,,	C.
258	F	,,	5	28.25	102.50	,,	R.
259	G	,,	3	28.25	101.00	,,	C.
260	G	,,	4	28.25	102.50	,,	C.
261	G	,,	5	28.25	104.00	,,	C.
262	H	,,	4	28.25	104.00	,,	C.
263	J	,,	3	28.25	104.50	,,	C.
264	J	,,	4	28.25	102.00	,,	C.
265	J	,,	5	28.25	104.50	,,	S.
266	J	,,	6	28.25	104.50	,,	S.
267	K	,,	6	28.25	103.50	,,	R.
268	K	,,	7	28.00	102.50	,,	S.
269	L	,,	6	28.25	105.50	,,	C.
270	L	,,	7	28.00	97.50	,,	R.R.

No.	Obverse	Reverse	Size m.m.	Average weight grains	Metal	Comparative rarity.
271	L	with 8	28.00	104.50	Copper	C.
272	M	,, 3	28.25	117.50	,,	C.
273	M	,, 3	28.00	102.50	Brass	E.R.
274	M	,, 9	28.50	113.50	Copper	R.R.
275	N	,, 3	28.75	108.00	,,	C.
276	N	,, 9	28.75	111.00	,,	E.R.
277	N	,, 11	28.50	103.50	,,	S.
278	O	,, 2	28.50	110.00	,,	R.
279	O	,, 3	28.00	113.00	,,	R.R.
280	P	,, 13	28.50	106.50	,,	S.
281	P	,, 14	28.00	106.50	,,	S.*
282	P	,, 15	28.50	105.75	,,	R.R.
283	P	,, 16	28.00	107.00	,,	S.
284	Q	,, 13	28.50	105.50	,,	R.R.
285	Q	,, 15	28.50	103.50	,,	R.
286	R	,, 3	28.50	111.00	,,	R.R.
287	R	,, 9	28.50	111.00	,,	C.
288	R	,, 10	28.50	114.50	,,	C.
289	S	,, 12	29.25	125.00	,,	C.
290	T	,, 12	29.25	126.50	,,	E.R.

(*To be continued*)

*Some pieces of this No. 281 are found showing a damage to the die at the character 開. It reveals itself in the shape of a big spot in relief blotting out half of that character at the dexter.

WORSHIP

The autumn stillness was brooding over the village like a bird tired from the day's flight.

It was on Kwanyin's birthday, and I was going to the temple with my fruits for the worship. My friends laughed at me, the village wise man shook his head ; but I heeded them not. I was going to my worship.

But you came from behind the gates and plundered me with your smiles. My fruits you laid aside with playful carelessness. I forgot my mission and found you the goddess of my worship.

A. C. WANG

A handsome Iron Statuette of the Sung Period which was presented to Their Majesties King George V. and Queen Mary by Dr. Wu Lien-teh, as it was thought that the Face of the Statuette bore a distinct likeness to that of the late Queen Victoria. The Statuette is now kept at Windsor Castle

CORRESPONDENCE

THE TRANSLATION OF CHINESE

To the Editors,

Dear Sirs,—I have only just noticed the letter on the above subject from Mrs. Ayscough in the August, 1925, issue of the *China Journal of Science and Arts*.

I do not wish to discuss the general question raised, further than it affects one example quoted by Mrs. Ayscough, namely, the late Mr. Joly's translation of Book I (Chapters 1 to 24) of the *Hung-lou mêng* (which, like some, though perhaps few, of the school-books of one's salad days, has always had a strong fascination for me, being one of the books we studied and were examined in during our first two years, 1884-86, in Peking, when China was still China).

"'I referred with admiration,' writes Mrs. Ayscough, 'to that marvellous rendering of colloquial Chinese which Mr. Joly accomplished in his translation of the *Hung Lou Mêng*.' 'It may be accurate,' replied her friend, 'but it is such poor English.' 'And such perfect Chinese,' was the reply.'"

When, as a youth of nineteen, I entered on my Chinese studies in Peking, it was emphasized by those who superintended our training that a translation in which you could "see the Chinese through the English" was a bad translation. Mrs. Ayscough's contention that the choice lies between the "catholic" and the "idiomatic," and that a combination of "poor English" and "perfect Chinese" is to be preferred and referred to with admiration, seems to me to be open to question.

Joly's English, in his "marvellous rendering," may be "poor," and, taking the 378 pages as a whole, it is difficult to describe it as very good. He did not pretend to be what is known as a Chinese scholar, and, even with such easy colloquial Chinese as that of the *Hung-lou mêng*, had to seek more help than one would have expected from a man who had been through his two years' course at Peking. This help was obtained from an English-speaking Chinese clerk attached to H.B.M. Consulate at Canton, to whom batches of slips came daily by post from Macao with the Chinese phrases written on them and a space left for the English rendering. Perhaps this method accounts for the "Chinese flavour" mentioned by Mrs. Ayscough. Joly's chief object, I think, was to finish as much as possible of this long novel speedily, knowing as he did that, with the advanced phthisis from which he suffered, his days could not be greatly prolonged. Under these circumstances he might well have been excused had there been signs of haste in his work, but of this I find none, though I find more pleasure in reading the original Chinese text or the translation presently to be named (or both these latter) than I do in reading his, and for this reason, that it fails to combine the best English and the best "Chinese," as, so I hold, the perfect translation should.

Admitting, for the sake of argument, that "poor English" may be "perfect Chinese," i.e. capable of depicting Chinese life (or the original author's meaning or idea) vividly to the reader, surely it must also be admitted that "perfect English" is capable of depicting it (or them) equally vividly.

This, certainly, is the distinction Mrs. Ayscough makes. She leaves no room in her remarks for inference that "perfect Chinese" and "perfect English" go together—in fact, she leads the reader to believe that these are the only two "methods of translation."

The alternative results of this attitude are a vivid picture spoilt by "poor English," and an obscure picture depicted in good English. To these, I, for one, would prefer an equally vivid picture enhanced by the added pleasure of "perfect English." Anyone who prefers the former must surely have a distorted idea of æsthetical value. It seems to me a matter of regret that Mrs. Ayscough and Miss Lowell should have adopted the less graceful method, for there is nothing to show that they might not have succeeded in placing Chinese ideas in the more attractive garb (though I must confess I have not read much of Mrs. Ayscough's writings, and am not in a position to give a decision on this point).

I think I can show that there is an alternative—or *via media*—to these two methods (the so-called "idiomatic" and "catholic") which is better than either,

but which requires special qualities not frequently met with in translators of Chinese. If ever there was a foreigner who was at the same time a Chinese scholar, a born translator and a born master of English, that foreigner was Sir Thomas Wade. Anyone in a position to judge could not but admit that his scholarship rested on its own intrinsic merit, and not on any unreasonable prejudice in his favour as British Minister, or undeserved vicarious virtue which titles and "honours" often bring to their bearers in such disproportionate and sometimes absurd measure. If a good English scholar of Chinese can produce a "perfect" ("idiomatic") Chinese translation, and a good English scholar of English can produce a good "catholic" one, then it is only logical to suggest that a man who is both will produce the best result.

In support of this contention I propose to quote in parallel columns a few passages (many would take up too much space) from Sir Thomas Wade's and Mr. Joly's translations of the first part of the *Hung-lou mêng* :—

Wade.

1.—"Chên Shih-yin sees in a dream the *t'ung-ling* stone. [The explanation of *t'ung-ling* comes in its natural order in the text.]

Chia Yü-ts'un has thoughts of love as he toils along in search of fame."

2.—"This is the opening chapter of the book. The writer says to himself: After passing through a dreamy period of life, I have been led to conceal realities, and borrow the *t'ung-ling* stone as a metaphorical subject for this *shih-t'ou chi*, or 'Record of a Stone.' Hence the adoption of the title *Chên-shih yin*, or 'True things concealed.' As regards the matter recorded in the book and the personages therein described, he further soliloquizes as follows."

3.—"Thus it is that at the present time my lattice of weeds and straw-thatched hut, my bracken bed and hearth of tiles, have not the power to distress me, while as I face the morning breeze and evening moon, the willows in front of my terrace and the flowers in my garden, I feel that moisture is added to my pen."

4.—"In the occasional use of the characters *mêng huan* (dreams, unrealities) and the like, the actual design of the book may be further seen, while they are also employed with a further intention of reminding the reader that it is only fiction after all."

5.—"The stone actually answered and said: 'My Master, why need you be so very narrow-minded? In my opinion the successive historical novels

Joly.

1.—"Chen Shih-yin, in a vision, apprehends perception and spirituality.

Chia Yü-ts'un, in the (windy and dusty) world, cherishes fond thoughts of a beautiful maiden."

2.—"This is the opening section; this the first chapter. Subsequent to the visions of a dream which he had, on some previous occasion, experienced, the writer personally relates, he designedly concealed the true circumstances, and borrowed the attributes of perception and spirituality to relate this story of the Record of the Stone. With this purpose, he made use of such designations as Chen Shih-yin (truth under the garb of fiction) and the like. What are, however, the events recorded in this work? Who are the dramatis personæ?"

3.—"Hence it is that the thatched shed, with bamboo mat windows, the bed of tow and the stove of brick, which are at present my share, are not sufficient to deter me from carrying out the fixed purpose of my mind. And could I, furthermore, confront the morning breeze, the evening moon, the willows by the steps and the flowers in the courtyard [why couldn't he?], methinks these [!] would moisten to a greater degree my mortal pen with ink."

4.—"More than any in these pages have been employed such words as dreams and visions; but these dreams constitute the main argument of this work, and combine, furthermore, the design of giving a word of warning to my readers."

5.—"'Sir Priest,' the stone replied with assurance, 'why are you so excessively dull? The dynasties recorded in the rustic histories, which

Wade.	Joly.
that have appeared do not do more than borrow the characters or the rôles of the Han or the T'ang. It is better, as in the matters recorded by me, not to borrow this dress, but only to embody facts, conditions, and principles based on personal experience, and thus produce something fresh and different from the old style.' "	have been written from age to age, have, I am fain to think, invariably assumed, under false pretences, the mere nomenclature of the Han and T'ang dynasties. They differ from the events inscribed on my block, which do not borrow this customary practice, but, being based on my own experiences and natural feelings, present, on the contrary, a novel and unique character.' "
6.—" I have no worth that I may go to patch the azure sky, In vain I've come into the world so many, many years, This is what happened both before and also after me, Whom shall I ask to note it down and make a story strange ? When the emotionless Taoist priest had read these words through once, he knew that this stone had some story connected with it."	6.—" Lacking in virtues meet the azure skies to mend, In vain the mortal world full many a year I wend, Of a former and after life these facts that be, Who will for a tradition strange record for me ? K'ung K'ung, the Taoist, having pondered over these words for a while, became aware that this stone had a history of some kind."
7.—" Lose me not, forget me not, Eternal life shall be thy lot."	7.—" If thou wilt lose me not and never forget me, Eternal life and constant luck will be with thee ! "

In Wade's rendering nothing is lost of vividness or accuracy, as comparison with the Chinese text will show, whilst to the translation is superadded an excellent, pleasure-giving English style. The above extracts will, I think, be sufficient to establish my contention. If not, I can quote many more ; in fact, did space permit, I would like to reprint the whole of Wade's and the whole of Joly's translation of the first twenty-four chapters in parallel columns. Joly's life was too short, and Wade's too busy, to translate the whole work ; but did these two completed works exist, there can be no doubt, to my mind, as to which would be regarded as the masterpiece. An English translation of Chinese is presumably intended for an English reader unacquainted with the Chinese language, and it is reasonable to suppose that he would prefer to have it in good English rather than in " poor " English plus an idiom he does not understand. A translator using poor English would have no right to shield himself under the excuse that his " poor " English was " perfect " Chinese.

If the " idiomatic " method were exclusively followed in say a translation from French into English would not the result be rather comic ?

Yours faithfully,

EDWARD CHALMERS WERNER.

Peking, January 1, 1927.

THE EARLY USE OF IRON IN CHINA

Kaifeng, Honan,

February 15, 1927.

The Editor,

The China Journal.

Dear Sir,—I wonder if you or any of your readers would kindly enlighten me as to the early use of iron in China.

From Dr. Laufer's book, " Chinese Clay Figures," I gathered that iron came into use in China in the Later Han dynasty—though I have not the book at hand to verify this impression.

On the other hand, Hirth, in "Ancient History of China," states that iron was used in the seventh century B.C. for utensils, and in the fifth century for weapons, and that there was an iron monopoly under control of the government in the seventh century, B.C.

Bishop Bashford also, quoting from E. T. Werner's "Descriptive Sociology of the Chinese," says that "iron mines were opened in very early ages, iron was used for money and for tools, and the iron industry assumed a growing importance between B.C. 1122-1221."

If this is so are there any iron tools or utensils or weapons of pre-Han times in existence, and where may they be seen?

Thanking you in anticipation for any information the China Journal may be able to give.

I am,

Yours truly,

WILLIAM C. WHITE, *Bishop.*

EDITORIAL COMMENTS

FRESCOES

The new Bulletin de l'Institut de Sinologie de l'Université Nationale de Pékin, Vol. 1, No. 1, contains several articles on the frescoes which are on exhibition in the museum of this institution. These frescoes came from the Hsing Hua Temple (興化寺) in Chi Shan Hsien (稷山縣), in the southwest corner of Shansi province. Illustrations of two of these frescoes are attached. In all, these frescoes portray seven Buddhas. At the back of the Buddha and about level with and on both sides of his head are angels and in front of the figure are two standing attendants, Bodhisatva (菩薩). On either side of these attendants are two standing female figures and still further along two kneeling female figures. The whole picture includes other figures but these are the only ones given in the illustrations which accompany this article. The central figure of Buddha is seated on a high octagonal pedestal. The figures are elaborately painted and present a striking appearance. There are three horizontal joins in the figure of the Buddha and two joins in those of the female attendants. The perpendicular joins occur about every two feet.

The temple from which these frescoes were taken was visited in the summer of 1926 by Mr. Li Chi-chih (李濟之), a professor in Tsing Hua College, and he discovered, on a fresco which still remains in the temple, the date 1238, i.e. the *wu hsü* year of the founder of the Yüan dynasty (時大元國歲次戊戌仲秋葵生十四葉工畢). In the "Records of the District of Chi Shan" (稷山縣志) the location of this temple is given and it is stated that it was built in the twelfth year of the K'ai Huang period, 581-601, of the Sui Dynasty. Before the discovery of this date by Professor Li there was much discussion among the members of the Institute of Sinology as to the age of these frescoes. Some maintained that they belonged to the T'ang period; others held that such paintings in the T'ang Dynasty always had Taoist subjects and that it was not until the Sung and Yüan periods that Buddhistic subjects were chosen; but the discovery of the actual date put an end to these arguments. It is well-known that the founder of the Yüan Dynasty, Ghengis Khan, employed a Nepalese workman whose Chinese name was Aniko (阿尼哥), who was an expert workman in the manufacture of images. Under the orders of the emperor he instructed a Chinese pupil, Liu Yüan (劉元), who made a great reputation for himself as a painter of Buddhistic subjects and who rose to high official position. These frescoes of the Hsing Hua Temple must have been produced under the direction of the school founded by Liu Yüan.

The first fresco painting of which I have found record is that of Ku K'ai-chih, 5th Century, in the Wa Kuan Temple (瓦官寺) at Nanking. Many fantastic tales are

Photo by R. V. Dent

The Head of one of the Female Figures in the Frescoes from Hsing Hua Temple in Chi Shan Hsien, South-west Shansi, now in the Museum of l'Institut de Sinologie de l'Université de Pekin

Photo by R. V. Dent

The Head of one of the Female Figures in the Frescoes from Hsing Hua Temple in Chi Shan Hsien, South-west Shansi, now in the Museum of l'Institut de Sinologie de l'Université de Pekin

told of the striking and illusive character of these paintings of Ku. In the T'ang Dynasty many of the temples of Western Ssuchuan were decorated with frescoes. Li Chih-ch'un (李之純) of the Sung Dynasty, who was an intimate friend of the great poet Su Tung-p'o (蘇東坡), has left a record of the frescoes in the Shêng Tz'ŭ Temple (聖慈寺) in Ch'êng-tu. He states that the walls of ninety-six rooms, large and small, were decorated with frescoes. The "Strange Records" (獨異志), by Li Jung (李冗), records that, during the K'ai Yüan period (713-741) of the Emperor Hsüan Tsung (玄宗) of the T'ang Dynasty, Wu Tao-tzŭ painted several frescoes of supernatural creatures in the T'ien Kuan Temple (天官寺). In the "Old Records of Hangchow" (武林舊事) it is stated that in the Wu Shêng Temple (五聖廟) at the West Lake there were frescoes painted by Su Han-ch'ên (蘇漢臣) and in the Hsien Ying Kuan (顯應觀), a Taoist temple, there were landscape paintings by Hsiao Chao (蕭照), but that none of these paintings were preserved. As far as I know there are no records of any distinguished painter of the Ming or Ch'ing Dynasties who decorated walls with frescoes. At the present time such work is done solely by artisans.

It is agreed by all writers that the object of these frescoes of religious subjects was either to accumulate merit or to be votive offerings in prayer for some particular object. They were on the same plane as other contributions made to temples for pious purposes.

J. C. F.

REVIEWS

THE LONG OLD ROAD IN CHINA, by Langdon Warner: Doubleday Page & Company, New York, 1926; pp. 168. Price G.$5.00.

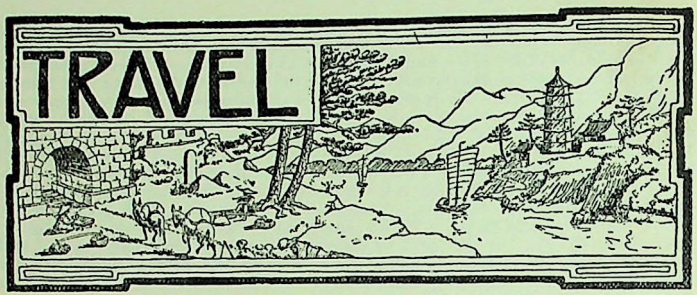
With some few additions and alterations *The Long Old Road in China* is a reprint in very attractive format of articles published by Mr. Warner in *World's Work*, February to May, 1925, recounting the adventures of the archæological scouting expedition made to Tun Huang by himself and Horace Jayne in the fall and winter of 1923. Knowing that the book was written for popular consumption one looks for and finds little data on the actual archæological work, and one enjoys the volume as an entertaining book of travel written in a delightfully vivid and readable style. Occasionally the author permits himself to say a good word for some individual Chinese or for ancient China, but there are few pages not marred by his unconcealed contempt for the China of to-day; a contempt which, known to the Chinese from the original articles, must certainly bear its share of responsibility for the disappointments that attended the succeeding expedition of 1925 mentioned briefly by the author. Many friends of Mr. Warner will be glad to read and have the book, though even among these most interested readers will be a number who think the price of the volume rather out of proportion to its content.

B. M.

NORTH-CHINA DESK HONG LIST, 1927, published by the "North-China Daily News & Herald, Ltd.," Shanghai. Price $9.00, map $1.00 extra.

The highly useful publication known as the North-China Desk Hong List has made its appearance for 1927 in a new form which is undoubtedly an improvement over the old one in many ways. The new edition takes the form of an ordinary volume, instead of the awkward oblong shape as heretofore, so that it is more easily handled, though possibly it takes up a little more desk space. The various sections of the book have been carefully revised and brought up to date. Besides a directory of business firms and various institutions, shipping, railways, and a who's who, the new Hong List contains other sections of interest and value in the way of calendars, foreign and Chinese, tables of weights and measures, exchange tables, postal union rates, and also information regarding diplomatic and consular services, making it one of the most useful adjuncts to an office in China.

M. R.



THE CHINESE-TIBETAN BORDERLAND AND ITS PEOPLES*

BY

PAUL HUSTON STEVENSON

Human populations, no less than other biological groups, are composed of a variety of elements—brought together by no one knows what wind, nor whence, nor when. Once in contact, however, the elements are soon involved in a process of fusion. Any even moderately densely populated region of the earth bears witness to the human movements and pressures that are, and have been, operating throughout human history, smoothing out the original differences between the peoples concerned and blending them into a common type. This process in the case of the Chinese people, whose resultant physical characters are the object of our particular investigation, constitutes a study of extreme interest. Here in Eastern Asia we have an agglomeration of heterogeneous elements, all of them at some time or other drawn in from the periphery by the attraction of a superior social organization of one particular group. Later forced into a common mode of living by the extremely monotonous environment of this great deltaic plain, these variously derived human elements have coalesced, except for a few obstinately refractory types, into a population that constitutes a unit when looked at as a whole. But the apparent homogeneity of this population is far from real. To determine the components of this population, as we are trying to do, is not an easy nor always a hopeful task — yet it is one that we have undertaken.

A few cardinal principles guide us in our investigation. One of these leads us to conduct our study as much as possible on the fringes of the great population mass in question, and examine there the as yet unassimilated fragments or the arrested particles that have failed to lose them-

* Being an account of an Anthropological Reconnaissance conducted in the spring and summer of 1926 presented before the *Peking Society of Natural History*, Peking, October 8, 1926.

selves in the centre. A short trip into Mongolia in 1922 and two subsequent expeditions in Shansi into certain regions of special interest had served to acquaint me somewhat with the types involved in the fusion going on along the northern border of this racial complex. A similar study of the western border mixture was highly desirable, and in the spring and summer of 1926 the much hoped for opportunity to visit the western borderlands presented itself. The distances to be travelled were enormous (approximately five thousand miles for the round trip to and from Peking) and the time unfortunately was limited to a single season. To have accomplished more than a mere reconnaissance of the problem at this time was impossible. This brief account of the trip purposes to share with a larger group a few of the glimpses that I obtained of not only one of the least known regions but also of some of the most interesting peoples found in all Asia.

Shortly before daylight one morning early in May I picked my way down through the narrow streets that led to the east gate of Chungking. The going, difficult at best on account of the darkness and the irregularity of the paving stones, was far from improved by the dripping water that marked the trail of the early morning water carriers. A nod at the drowsy sentinel, and my four *tiaofus* (carriers) and I slipped through the narrow crack of the still partially closed gate, and paused a minute before beginning our slippery descent to the water's edge below.

Chungking is unique among the large cities of China in that it is perched upon the top of a giant outcropping of rock. There, safe above the confluent currents of the Kialing and the Yangtze Rivers that rush wildly together at its feet, the city wall that encircles this "Great City of West China" looks down from a height of well over one hundred feet above the mean low water mark of the rivers below. The height at which the city is built above the stream beds represents no idle fancy—for the mean seasonal rise and fall of the Yangtze at this point is in the neighbourhood of one hundred feet. This tremendous fluctuation of the water level at the city gives a corresponding variation in the appearance of the city as viewed from the river.

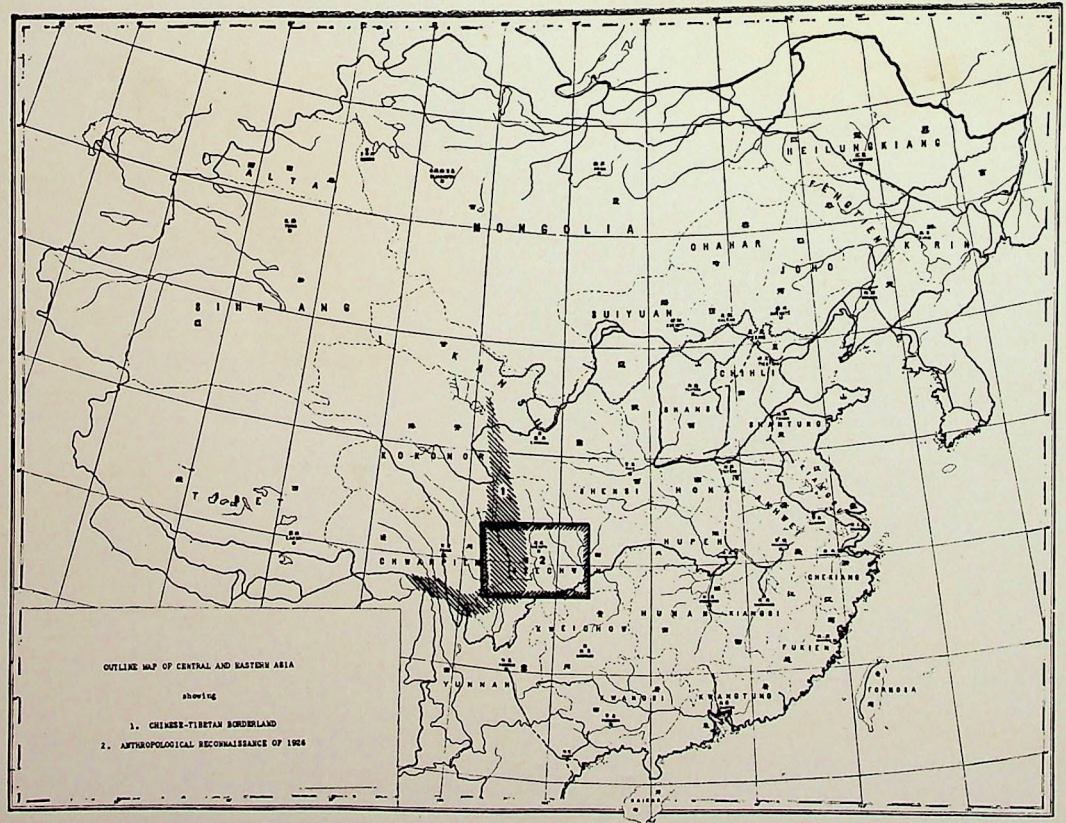
The sight is best, I believe, at low water stage, as it was when I first saw it. Then, mounted high on its rocky eminence and with its several colonnaded foreign-style buildings silhouetted sharply above their meaner surroundings, the city reminds one of what ancient Athens must have looked like, similarly built upon a rocky prominence with her public edifices rising above the common buildings of the rest of the city. Then also, at low water level, are seen the innumerable rock-hewn steps that bridge the vertical gap between the city and the water's edge. From a distance these steps look like long dangling ropes hanging down from the city gates above and fraying themselves out into divergent strands on the exposed beach below. Each path consists of hundreds of stone steps, rudely cut out of the nearly perpendicular rock upon which the city is built. Up and down these slippery steps swarm the water carriers and other toilers ministering to the city's needs. This is indeed an impressive sight—one that I was to miss three months later when, with the

water over eighty feet higher, I returned to Chungking and found the city gates only a few feet beyond the reach of the rushing stream.

Down one long row of these steps I slipped and slid in the misty morning light of the day in question. At the bottom, with one last spasmodic and, fortunately, successful slide, I landed on the small boat that was to carry me for some distance on the first stage of my long journey to the Tibetan border beyond.

There are several routes of choice between Chungking and Chengtu, the capital of Szechuan and my first objective. One is up the Yangtze to Suifu, then up the Min River to Kiating, and thence to Chengtu either by small native boat or overland by chair. This "water route" is the one of choice if the stage of the water above Chungking makes navigation possible for the small steam or motor boats that have recently begun to ply these upper stretches of water all the way to Kiating. In this case Kiating can be reached in about five days. Another three days to Chengtu makes the total time for the trip only about eight or nine days. Another route, that most commonly used, is overland by the so-called "big road." Eleven nights on the road the traveller will be given the opportunity to try out the progressively worse Chinese inns in the wretched towns along the road. On the twelfth day, if everything goes well, he will arrive in Chengtu and that night enjoy a much needed bath and a comfortable bed. But an irresponsible military had taken possession of all the towns on this big road at the time I wanted to reach Chengtu, making travel over it unpleasant and illadvised. I had to choose, therefore, a third, well-known but somewhat longer route, the so-called "small road." This road bears away straight to the north from Chungking, following and in places making use of the Kialing River to Suining, thence westward across to the big road which it meets at Ch'ienchow and follows into Chengtu. Under ordinary circumstances this road has taken until recently about fourteen days to travel. An enterprising young Szechuanese graduate of a Shanghai technical college, however, has inaugurated a motor launch service between Chungking and Yochow, thus reducing the trip by three days. It was my further good fortune to be the first passenger on a trial trip of the extension of this service all the way to Suining, hence my arrival in Chengtu in the record time of nine days.

The section of the small road from Suining to Ch'ienchow leads through the heart of the so-called "red basin" of Szechuan. The name, given the region by the late Baron von Richthofen, whose researches and descriptions have made the region well known, is indeed appropriate. Stretching away on every side as far as the eye can see, over an area of approximately a hundred thousand square miles, are regularly shaped conical knolls of red clayey sandstone, slowly weathering down to a new plain level. In past geological ages this region was a large inland lake, and its floor was fairly level. To-day, through the drainage of these waters by the Yangtze river, the region is exposed to the erosion of innumerable streams that makes of it a country of great hilliness, but of marvelous fertility and natural beauty. In point of natural history the basin is a unit by itself, and several naturalists have devoted considerable attention to its particular flora and fauna. This "interior basin" is of



Location Map showing (1) the Chinese-Tibetan Borderland, and (2) the Area covered by the Anthropological Reconnaissance by Dr. Paul Huston Stevenson

considerable interest on account of its population and offers not only the starting point of our observations on the peoples of West China but also an excellent example of one of the factors determining the distribution of the Chinese peoples from time immemorial.

The population of China, as indeed of the whole world, is very unevenly spread over the region it calls its home. The chief factor that has influenced the direction and limits of Chinese expansion is one of agricultural technique. Chinese civilization has from the beginning been an alluvial-plain agricultural civilization, built upon the art of irrigating the fields by artificial control of the water supply. This art of regulating the distribution of the water by canals was probably developed, in the case of the early Chinese, on the alluvial fans along the northern periphery of the great Asiatic massif. There in Central Asia the snow and cloud-fed streams emerging from the narrow valleys on the south could be controlled by the simplest of irrigating works before the water lost itself either in the sands or in the larger rivers of the Tarim basin on the north. This ability to regulate the water supply of small areas for agricultural purposes was gradually improved along the route and in the halting places of the subsequent eastern migration of the Chinese into the historic basins of the Wei and Yellow Rivers. In these larger areas this earlier " oasis technique" was perfected and applied to basin areas of less restricted dimensions. Larger communities came to depend upon a common controlled water supply ; and there were thus gradually developed the collective consciousness and co-operative social solidarity that later constituted the greater part of China's claim to cultural superiority over the surrounding peoples.

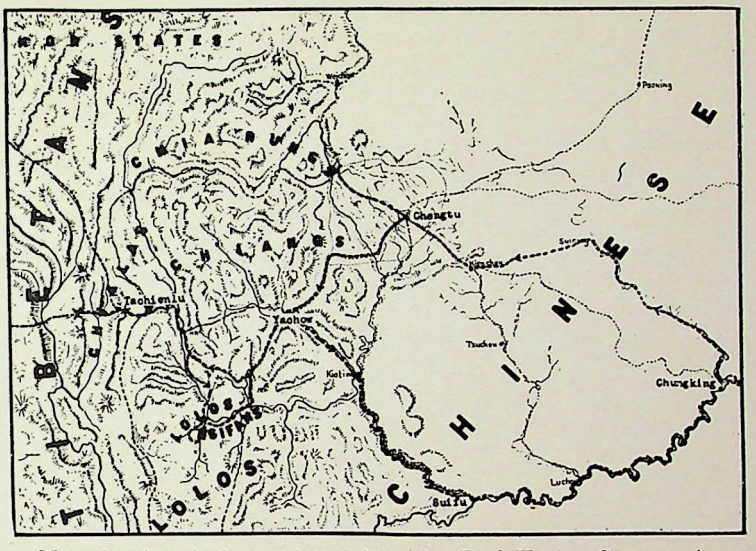
This mastered and highly developed technique of restricted basin cultivation became in turn the master of the early Chinese. The direction and limit of expansion of subsequent generations were determined by this technique and by the type of social organization that had grown out of it. The early advance of the Chinese was not by contiguous expansion, but was of necessity accomplished by the acquisition of a series of isolated basins one after the other. The country intervening between these basins was by no means always inhospitable or sterile, but often merely unsuited to the irrigation type of cultivation. These intervening hilly regions were therefore left in the hands of the earlier inhabitants, whose cruder methods of agriculture and dependence upon hunting made it possible for them to eke out an existence in the uplands. Thus we had, and still have in many regions, two populations living side by side. Though in contact, they usually do not mix, having little if anything in common. The hunter, shepherd or primitive agriculturalist of the uplands, and the rice growing irrigator of the lowlands, each is held fast as in a vise by an instinctive adherence to his own traditional methods of securing a livelihood. Under such circumstances, and out of a whole series of conscious as well as unconscious reactions between each group and its own particular mode of life, there have developed many fundamental differences in the current survival values and mechanisms of the respective groups. New racial differences have developed, and those existing have been still further accentuated.

The picture just sketched is one of rigid geographical control of nature in the distribution of human populations in general and of the early Chinese in particular. Such geographical control is still evident to-day in regions removed from the great centres of man's creative civilizations and their subsequently rapidly blending human populations. Szechuan's red basin, its Chengtu plain, its western borderland of successive and increasingly high and rugged mountain valleys, and the lofty plateau of Tibet beyond, provide opportunities for the study of human geography that are equalled in few other places in the world.

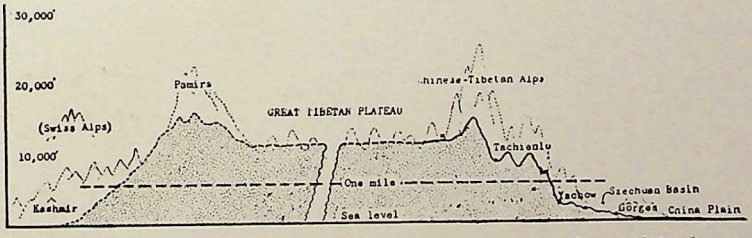
The present Chinese population of this great inland basin, called the province of the four rivers, Szechuan (四 川), is of interest because of the progressive reblending of already blended Chinese types at present going on there. That this fertile basin boasted kingdoms and dynasties before the coming of the Chinese is generally conceded by historians. That the original, or at least the earlier, inhabitants were pushed by pioneer Chinese agricultural invaders to the mountains bordering the region to the south and are to-day represented through their descendants in the hill-peoples of Kweichow is also believed to be true from a knowledge of the general trend of the ethnic movements going on at that time in these regions.

At the beginning of the historical period in China the peoples of this area were divided between the kingdoms of Pa and Shu, occupying the eastern and western parts of the basin respectively. These seem to have been an agricultural people, and were probably of a racial stock closely related to the petty Chinese states that had settled in the basins beyond the Tsing-ling barrier to the northeast and with whom they had relations by intermarriage of members of the ruling families as early as 600 B.C. The marvelous fertility of the basin was well known to Ch'in Shih Huang, who built one of the first military roads in Chinese history over the Tsing-ling range to tap this basin and annexed it for his granary as the first step toward his subsequent campaigns against the kingdom of Ch'u and other states then occupying the Yangtze Valley.

The subsequent history of this region is one of successive wars of conquest and rebellion. Decimation of the population has occurred times without number, the last being during the stubborn resistance offered by the Mings in this region at the time of the Manchu conquest. Repopulation in each case has occurred through the immigration into the area of peoples from the provinces on the east and north, and the present population is composed very largely of the descendants of peoples that have migrated into the region within the last two hundred years. Kansu, Shensi, Honan, Hupeh and Hunan have furnished the largest number of immigrants. Colonies of Kiangsi and Kwangtung people are also to be found in considerable numbers, as a rule remaining somewhat apart from the rest. One point of interest about these migrations is that they were usually family migrations, the people taking with them household gods and family traditions. Szechuan families of many generations have zealously retained their original provincial identity and proudly proclaim themselves to be Honanese or from Shansi, or from almost any other province rather than admitting an ancestry of Szechuanese line.



Map showing, in heavy dotted line, Dr. Paul Huston Stevenson's Route across the Szechuan Basin and through the Chinese Tibetan Borderland to Tachienlu and beyond. Other main roads shown in lighter dotted lines



East-west contour of the Tibetan Massif, showing Altitudes traversed in mounting the Eastern Rim

The only level spot in all Szechuan is the Chengtu plain—well called "the garden of Western China." In this small area, only one hundred miles long and sixty miles wide, all the economic and other factors operating in the "red basin" are brought to a focus. Approximately forty-five million people, or over one-tenth of the population of China, find their home in Szechuan to-day—and over ten million of these are supported by the Chengtu plain.

This tremendous human population, swarming at a saturation point of over eight hundred people to the square mile, maintains itself by the marvelous irrigation system built by Li Ping twenty-one hundred years ago. In this basin the early Chinese merely put into practice, in a spot marvelously favoured by nature for such a purpose, the lessons they had learned in far off Central Asia. The whole of the Chengtu plain is one enormous alluvial fan spread out over this expanded area by the Min River as it is suddenly released at Kwanhsien from the rocky gorges through which it has come down from the north. Over this alluvial plain, instead of being allowed to rush at will through channels of their own seeking and changing, the waters of the Min are divided at Kwanhsien, and, after provision being made for an overflow into the old stream bed thus maintaining a constant level in the canals beyond, the main body of the water is directed by means of an artificial cut through a small mountain spur and brought out upon the plain itself. There the waters are divided again and again through a capillary network of canals. These anastomose freely and supply the smallest cultivable patch of the area before they are finally gathered together at the southern border of the plain and are drained off ultimately into the Yangtze at Luchowfu after a tortuous course through the hilly salt-well region of southern Szechuan. Each year during the winter months this entire irrigation system is closed at Kwanhsien, the waters of the Min are sent back into their old course which skirts the snow ranges along the western border of the plain, and the irrigating canals cleaned out and got into readiness for the coming year. Each spring, with suitable ceremonies attended by thousands of pilgrims, the gates at Kwanhsien are reopened and the life giving waters again allowed to flow through their well regulated channels over this garden spot of Western China.

The different types of people at present occupying the Chinese portion of Szechuan need no explanation other than that of their diverse origin as mentioned above. Here, indeed, is a true melting pot, remelting and reblending, however, only the older fusions from other parts of China. Unlike the northern provinces, where a steady influx of alien blood is constantly being mixed with that of the Chinese, this western region seems to be receiving very little foreign blood from the non-Chinese populations on the west. What mixture with these peoples there is going on usually adheres to the non-Chinese or Tibetan element of the border population and is not diluting the Chinese nature of the populations of the region under discussion.

From Chengtu one looks westward at the mountain wall that shuts China in and Tibet out. To be sure Tibet does not begin, politically at least, at the first range to the west of Chengtu. Between this first snow

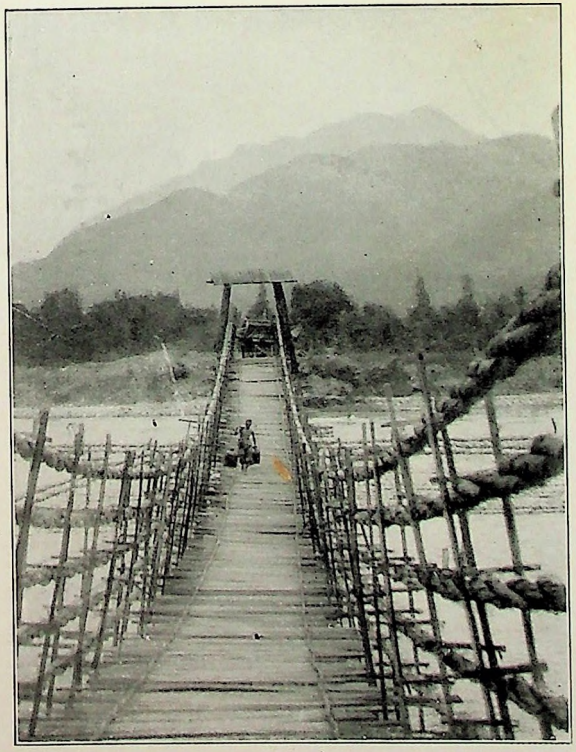
range and Tibet proper there lies a difficult stretch of wild mountainous country. This strip of intervening borderland is roughly one hundred miles wide and extends from Sungpan and the Kunka pass in the north down to the south where it fans out among the still wild but lower mountain ranges of Yunnan and northern Burma. This Chinese-Tibetan borderland consists of a series of ranges and valleys mounting higher and higher as one progresses from east to west, like a series of steps leading up to High Asia.

In these valleys live "tribes-people" of obscure ethnic origins and relations. The anthropological problems presented by these peoples are worthy of much more study than has been given them. Here in larger or smaller mountain valley communities are to be heard the lingering tones of some of Asia's most primitive dialects, spoken daily by a decreasing number, however, as the Chinese language on the east and Tibetan on the west is being adopted more and more by the younger generations. Lolos and Hsifan groups to the south, Ch'iangs and Giarungs on the north — each representing tribal complexes with innumerable subdivisions into larger or smaller units—provide problems of tremendous interest to both physical and cultural anthropologists. Adequate study of these peoples requires a much longer and more intimate contact with them than has been the good fortune of any anthropologist so far to make, and the opportunity is one that will not be present long.

One of the oldest and largest of these tribal complexes is that known under the collective title of the Ch'iang peoples. The early annals of Chinese history make frequent reference to the Ch'iangs, whose ancient centre was not far from modern Yachow and whose golden age as a great independent kingdom was contemporaneous with the existence of the kingdoms of Shuh and Pa on their east. Since the days of the T'ang Dynasty in China, the Ch'iangs have been sorely pressed between the conflicting Tibetans and Chinese. The plundering Tibetans of this period, using the Ch'iang valleys as the gateways into the rich lowlands of Szechuan, formed alliances with the Ch'iangs and although making little ethnic impression upon them nevertheless did leave the impress of an early form of Tibetan Lamaism upon the country. Standing out prominently beneath this thin veil of early Lamaism, however, is the still earlier nature worship, the mysterious Bönpa sex-worship. Certain elements of this primitive worship have been adopted in turn by Lamaism and are to be found exhibited in some of the obscure idols of almost any Lama temple, but here in the lonely valleys of the Chiarungs is to be found still in actual practice to-day the last remnants of this ancient cult. In essentials, probably, this worship forms the underlying foundation of most of the religious systems of Asia.

My first glimpse of the Ch'iang tribes-people was obtained at Kwanhsien. This city, already mentioned in connection with irrigation systems of the Chengtu plain, is situated about forty miles northwest of Chengtu and stands guard at a narrow opening leading out of the mountainous country beyond. It bears much the same relation to Chengtu both in direction and distance as does Nankow to Peking. The wild country beyond Kwanhsien is inhabited by a number of tribes grouped together

Road through the Bamboo Groves of the "Red Basin" of Szechuan



A Rope Suspension-Bridge from Chinese Territory into the Tribes Country at Kwanhsien

under the collective name of Giarungs. I was, unfortunately, unable to get farther into their country than a day's journey out and back along the road from Kwanhsien, but notes indicate that the few members that I saw were tall and rather muscularly built and distinctly un-Chinese in appearance. The skin of their faces takes on a reddish bronze tinge not unlike the American Indian. The large and well set head is surmounted by coarse straight black hair, the rather long face itself shows the same scantiness of beard that is found among the Chinese. The eyes are straight and moderately wide, the nasal bridge prominent and straight. The high cheek-bones were prominent in a forward rather than in lateral direction, and the chin long and prominent.

The women of this country, on any one of several counts, demand special note. Although not as pleasing in personal appearance (from an occidental viewpoint) as those of the Hsifan peoples to be met with several days' journey still to the west and south, yet they possess a certain forcefulness of character and bearing that compels attention. With characteristic aptness the ancient Chinese historians have called this region the "Eastern Kingdom of Women" (Tung Nü Kuo), thereby alluding to the fact that here as in another region to the west (and north) a matriarchal system of family and tribal rule prevails. In this region the principle of "women's rights" represents no shadowy or uncertain victory only recently wrested from the unwilling sterner sex, but rather constitutes the basic tradition of the land.

The few passing glimpses that I had of these scepter-bearing dames left me with kaleidoscopic impressions of small bodies, very fond of bright colours in dress, hair ornaments adorning faces that were very good looking when young but which aged rapidly, direct gazes and easy smiles that revealed in turn strong white teeth and ready tongues—in all a rather gypsy-like ensemble of feature and manner. I am quite ready to agree *in toto* with the description accorded this locally important section of the population by my friend Mr. Thomas Torrence of Chengtu, whose extensive travels among them and his appreciative observations lend authority to his small monograph, "The History, Customs and Religion of the Ch'iang." He says, "A Ch'iang girl's face is not her only fortune. She carries another of silver rings in her hair. Her full headdress is a most elaborate affair. For direct effectiveness of purpose Western millinery comes a long way behind. No European can describe its native charms. Only the ardour of a doting swain could do it justice. Sufficient here to say it is a wondrous maze of braided hair, shining silver, jewelled ornaments and fluted earrings enough to turn any youth's brain, very gaudy, very gay and very fascinating. A toss of the maiden's head with all that wealth on it means something here; a saucy look enforced by the flash of those precious stones means that it is absolutely crushing; while to the diffident wooer the very palpable evidence of so much maidenly industry makes the look in her eyes positively alluring. It is another case of "Gin ye dar' John."

Other travellers having the opportunity to judge have described these people as identical with certain tribes people along the northern border of India, in Nepal, Sikkim and Bhutan. Types of bridges used

in crossing the mountain streams, and other points of architectural and cultural similarity between these widely separated population, are not found among the intervening peoples. If indeed these two peoples in the mountain valleys to the south and east of the main Tibetan highlands respectively are one and the same people, then the indication would be that they represent an earlier population of central high Asia and owe their present peripheral distribution to a displacement from their former intermediate home by the coming of the present Tibetans. One of the distinct features of their settlements is the tall chimney-like tower frequently found in or near their larger villages. The purpose of these has given rise to vain speculation on the part of all who have seen them. Certainly the significance of these tall towers is not exhausted by their limited use as storehouses, watchtowers or places of refuge. They evidently have some connection with the religious practices of the ancient Ch'iangs and may represent, as often suggested, phallic symbols.

(*To be continued*)

TRAVEL AND EXPLORATION NOTES

EXPLORATION IN CHINA AT A STANDSTILL: The state of political upheaval and chaos into which China as a whole has been thrown by recent events has had at least one bad effect on progress, and that is that it has caused the cessation of practically all exploration work in the country. The disastrous results upon the work of the Third Asiatic Expedition of the American Museum of Natural History last summer, when the leader, Dr. R. C. Andrews, and members were unable to take the field at all, are well known. Dr. Granger and Mr. Nelson of this expedition are at present doing palæontological work in Yunnan, whither they have gone pending word from the headquarters of the Expedition in Peking regarding the resumption of exploration in Mongolia. Indeed, it is stated that it is very doubtful whether the Expedition will be able to resume work in Mongolia this summer as the authorities in Peking fear lest the supplies and valuable equipment of the Expedition should fall into the hands of the Soviets. Mr. Rock, who is out for the National Geographic Society, appears to be well out of the way of present political storm centres, though little enough news of his doings has come through. Recently, however, it is reported that he is returning to the coast as he has found it impossible to carry on even in so out-of-the-way a region as the Chinese-Tibetan border. For the rest, we can get no news of any exploration work being done, though there are a number of explorers in China only awaiting the chance to get to work again as soon as conditions make it possible.

As pointed out by us already many times, there is a tremendous amount of work waiting to be done in China in every branch of knowledge; there are also men qualified and only waiting for a chance to do this work; but the country is so unsafe as a result of banditry and civil war, not to mention a certain amount of anti-foreignism that has been fanned into flame by political agitators, that all such exploration work is out of the question for the present.

A. DE C. S.

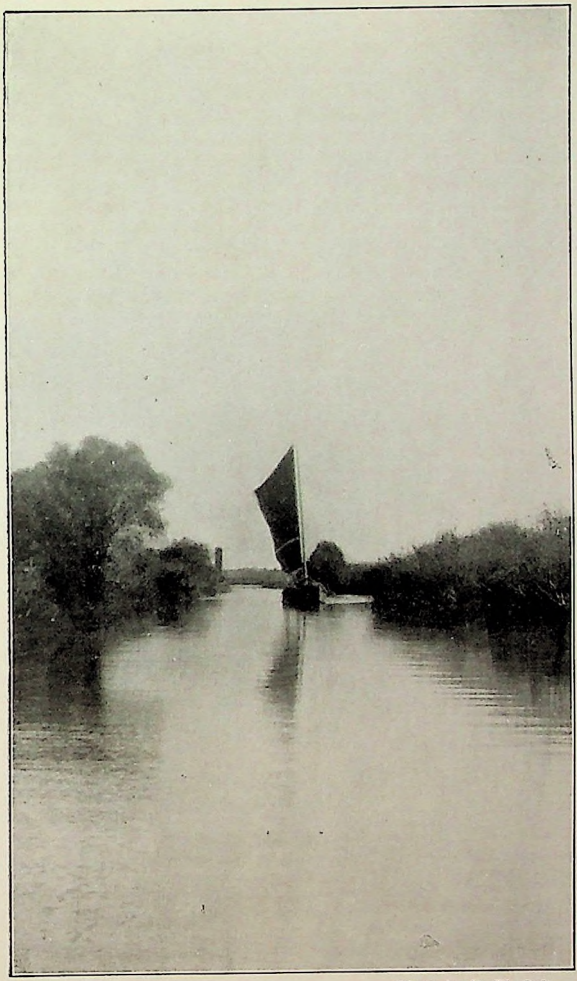
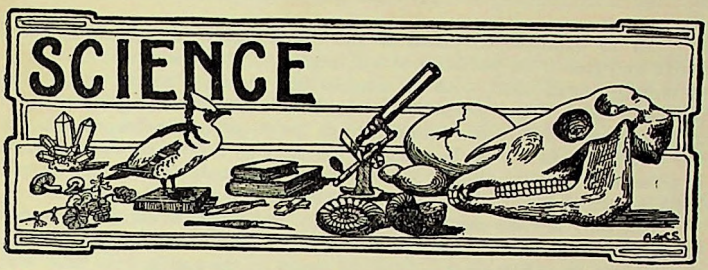


Photo by B. W. Gale

A peaceful Scene on one of the numerous inland Waterways of Kiangsu Province



SHELLS OF PEITAIHO

BY

A. W. GRABAU* AND SOHTSU G. KING.†

CHAPTER I.

INTRODUCTION

A. The Beach at Peitaiho.

Rock ledges, and between them, stretches of sandy beach—such is the coast of the Bay of Pechili at Peitaiho. Some of the ledges are low and flat, others high and often precipitous. Some extend far out, being continued beneath the sea as rocky reefs; others, such as Eagle Cliff, form a sheer descent, with narrow strips of beach at their base. Wherever the rocks form the coast-line, the waves dash upon them forming breakers, even when the sea appears calm elsewhere. These rocks retard the shoreward advancing waves, dividing the waters, which then sweep past them on either side. The waters hold in suspension the fine rock debris—that which has been broken by the waves from the cliffs, as well as that which is stirred up from the bottom of the bay. This debris is carried into the re-entrants between the ledges, and there piled up to form the connecting beaches, which have a crescent form, looped from ledge to ledge, like garlands of sand festooned between standards of rock. Beyond Eagle Cliff, one such beach was formerly in the process of formation. It was built by the sand carried northward from the cliff-foot, but was still incomplete, ending abruptly several hundred yards from the cliff. This incomplete beach which has since been destroyed was called the "sand spit." Behind it lies an older, more continuous beach which is complete. Other such beaches can be seen at low tide in the process of formation between Eagle Cliff and the opposite shore, being part of the great sand flat of that part of the coast.

*Dean of the Peking Laboratory of Natural History, and Chief Patæontologist to the Chinese Geological Survey.

†Curator and Hon. Secretary of the Peking Laboratory of Natural History, and Vice-President of the Peking Society of Natural History.

Let us examine the sand of the beach. It looks very clean and white and free from particles of soil, and careful examination will show us only grains of sand, with no dust or fine material which on wetting produces mud. And yet such fine material once was mingled with the grains of sand and is still mingled with them out in the deeper water of the bay; but the waves, in bringing the sand to the shore, have washed it clean and carried all the fine material out again into deeper water. This is part of the work of what is popularly known as the undertow.

Not only are the sands washed clean, but they are roughly assorted according to the size of the grains. In some parts of the beach the sands are coarser, in others finer. Looking again at the sands, this time with the aid of a magnifying glass, we discover that the grains are mostly of one material—" quartz " the mineralogist calls it. Quartz is the hardest mineral of common rocks, such as the granite, which forms most of the ledges on this coast, and when these are destroyed by weather and by wave, quartz remains behind to form the sand.

Mingled with the sand, here lying upon it, there almost or quite buried in it, are the shells. They are numerous in spots, few and scattered in other places. Close to the shore, and especially in sheltered nooks and in the angles of sheltered ledges, they are so abundant that they seem to make up the mass of the beach material. But, looking closely at these spots, one will find that most of the shells are broken, that indeed the mass of the material consists chiefly of small shell fragments. Only the smaller shells are complete and only the smallest of these are still unworn. One may scoop up a handful of this shell-matter and find in it almost no sand. Carefully picking it over one will find many pretty shells of small size. Some of these are of small species, others are the young stages of shells that normally grow to much larger sizes.

The beginner must be wary in collecting shells from such a spot. He may pick out shells with beautiful smooth surfaces, but these are not the original surfaces of the shells. The shells have been worn, the original characters destroyed, and, as scientific specimens, such shells are worthless. Perfect shells are seldom found upon the sands reached by the breakers. Such a shell may be cast up from the deeper water, but if it remains within the reach of the waves for any moderate length of time, it will be worn and broken. Generally the amount of destruction is in proportion to the size of the shell, rather than to its delicacy. The thin and delicate shells are sometimes found upon the sands in a surprising state of preservation. The reason for this appears to be the ease with which the delicate shells are lifted and kept in floatation during the onslaught of the waves, whereby they are kept from coming in contact with the sand or other shells, and so are preserved from wear; for water alone does not destroy the shell, though it may tear apart the two halves of the bi-valve shell. It is only when shells moved by the waves strike against other hard substances or are moved to and fro upon the surface of the sand, that destruction and wear takes place.

Many shells are floated shorewards by a gentle tide or urged to progress in the same direction on the sea floor by the gently advancing

waters. Such shells are generally not worn, because the movement is too gentle, and they may be left stranded upon the shores by the receding tide, where the first-comer will have a choice of specimens. This is more commonly the case where the tide, in flow and ebb, covers and uncovers broad stretches of level, gently ripple-marked sand-flats. That is why Shell Beach beyond Eagle Cliff forms the best hunting ground in Peitaiho for the shell collector. Usually the shell thus found is empty, the animal which built it no longer being enclosed by it. Some voracious feeder, out in the deeper water, perhaps a starfish, perhaps a carnivorous gastropod, has made a meal of it, and left only the empty shell to the mercy of the waves and tides. When the animals are alive within their shells, neither tide or ordinary wave will carry them from their proper feeding grounds. Storm waves to be sure, by stirring up the bottom on which they live, may succeed in hurling them ashore, and after storms one will find many a shell still inhabited by the animal to which it belongs. Others there are and many of them, which are inhabited by foreigners ; usurpers those, who found the empty shell left on the feeding grounds of starfish or other carnivorous feeder, and appropriated it for a convenient habitation. One group of animals, the hermit crab, has done this for so many generations that its bodily structure has become adapted to such an utterly foreign habitation as a snail shell. When this crab is young it occupies the shell of a small snail. Each year as it grows larger, it must seek a new habitation of a size commensurate with its increase in bulk ; so the crab-hermit migrates yearly from shell to shell but always to a larger one. These crab-inhabited snail-shells are easily distinguished from those which are still inhabited by their original occupant by the speed with which they are carried along by their foreign tenant. No snail's pace here, but a rapid scurrying across the sand.

It is always worth while to examine these crab-inhabited shells with care. Very often the shells themselves will be covered by encrusting animals, in this region usually by bryozoan colonies, but on other shores these encrusting types may be colonies of *Hydrozea*. We have had a snail or gastropod shell, part of which was covered by an encrusting growth of a bryozoan, another part held an *Anomia* shell, a member of the class of pelecypods, while upon the large claw of the hermit crab within the shell grew a tiny sea anemone. Here were four classes of marine organisms, three of them alive, all living together in harmony and mutual helpfulness and all carried about by the active member of the group—the crab.

B. How and What to Collect.

In the past, collectors of shells confined their activities chiefly to the full-grown or adult individuals, deeming the immature and very young shells as undeserving of notice. Indeed, one eminent conchologist of a past generation advised collectors and students to pay no attention to young shells, as they did not show the characteristics of the species. It is only in comparatively recent days that we have learned to recognize the true value of the young shell, and to-day no one who makes a pretense of being a scientific student of shells can neglect the young, for it is

by their study alone that we are enabled to recognize the true relationships of species and genera. Adult characters are frequently misleading and the similarity of two adults may suggest relationship, whereas the characters of the young of the respective individuals may indicate that they are entirely unrelated one to the other. This is not the place to enlarge upon the reasons which have convinced students of shells that relationships are more fully indicated by the young than by the adult. Suffice it to say that the young repeat the characters of the ancestor and that therefore identity in the characters of young individuals indicates community of descent, no matter how diverse the characters of the adults.

Young shells are common among the shell-sand and wrack near high tide mark, on shallow beaches, or in the protective angle of rocky ledges. Here they may be picked out from the broken fragments of larger shells. This should be done by spreading a mass of the shell-sand thinly upon a table, and then carefully picking out the young shells as well as the smaller species. Often these shells are worn, and are of little or no value, but in some situations the shells are merely swept together with a minimum amount of wear. The collector should look for specimens of the coiled gastropod shells with perfect tips—specimens with the embryonic shell or protoconch intact. These are the worthwhile shells, showing the minute apical coil, which is generally smooth, in perfect condition. Protoconch hunting is a fascinating occupation while resting from the tramp in search of adult shells along the shore. One needs a smooth board or table on which to spread the shell sand, a magnifying glass of moderate power, a pair of forceps or pincers, and many small phials or boxes (match boxes will serve) with cotton wool. These delicate shells must be protected; they must be bedded on cotton wool and covered with cotton wool to prevent movement and mutual attrition. Never put a shell with perfect apex loose in a bottle or box: never put it together with others. Be sure it rests snugly in a bed of cotton wool and is not disturbed by direct contact with other shells.

While protoconchs and young shell stages are best preserved in young shells, they are also sometimes found in full grown or adult shells. A perfect adult gastropod shell should always show the protoconch, but unfortunately the apical parts of most adult shells are broken or worn—or they are encrusted with other organisms. The collector should examine every shell when he finds it to see if it has a perfect apex. Indications of a perfect apex are apparent at a glance, but the actuality must be confirmed by the use of the magnifier. If the shell has a perfect apex, do not place it in the basket or box with the others but wrap it in cotton-wool and place in a separate receptacle, a phial or small box, of which the collector should always carry an adequate supply.

When the collection is brought to the laboratory, the shells should at once be roughly assorted, freed from sand, either by washing or brushing with a soft toothbrush, or, in the case of the small and delicate ones, with a camel's hair brush or Chinese writing brush. They should be stored in paper trays and labeled with the locality, date, and name of the collector, to which may be added any other information that seems pertinent.

Paper trays may easily be made from old envelopes, postcards or even stiff paper cut to postcard size. Fold over the long side of the card or paper, half an inch in width. Fold the ends over one inch in width. Pinch the corners of the box into right-angled triangles and bend them backwards against the ends of the box, then fold the projecting portion of the end down over the outside and the tray is ready

C. Cleaning of encrusted Shells.

Shells of mollusks which have died, and even those of living animals, often serve as a base of attachment for the young of bryozoan colonies, the spat of oysters, the larval barnacle and the young of other animals, which, after a period of floatation in the open waters of the bay, settle down to a life of permanent fixity upon the bottom of the sea. Sometimes the shell of a dead sea-snail or of an oyster is so fully overgrown by these squatters of the sea that their removal seems not worth the while. Sometimes indeed the residence of a tolerant host is so completely engulfed by his unbidden guests that his own individuality and that of his domicile become submerged beyond recognition. As a representative of his species the submerged individual is a failure, but as an example of the results of supine complacency he may form an interesting exhibit.* When, however, the encrustation has proceeded to only a moderate degree, hope of salvation may be entertained. Of course, if the individual is of a very common type, and shows no features of value, such salvation is hardly worth while and the specimen is best discarded. But, if the species is rare, or if the individual has unusual or interesting characters, it is worth while to use drastic measures to free it of the encrusting elements. Some specimens indeed well repay the collector for the labour spent on their restoration. We will deal with those epiliths in the order of the facility with which they are removed :

The easiest to remove are the baby oyster shells. Use an instrument with a sharp point, preferably a little bent (discarded dentist tools are most serviceable), put the sharp tip under the edge of the oyster shell or cluster of shells, then with a springing action of the fingers pry off the adhering young shells which will fly in all directions. Sometimes little bits will be left adhering rather tenaciously to the shell and these must be dealt with rather carefully. Carve them out with the sharp point of the instrument or with that of a big needle, following the direction of the striation or other markings on the shell surface of the host and finally clean the whole specimen with a wire brush. In the case of the barnacles, the bottom plate is the only part which offers much resistance, not only since it is unusually well cemented, but also because the side-plates of the barnacle preserve the base from the disintegrating influence of the sea-water. However, with patience and care, a specimen thus encrusted can ultimately be entirely restored to its original appearance. Those specimens that are covered over with *Bryozoa* are the most troublesome

*Large old oyster shells exhibit this conglomeration of types most effectively and make excellent ornaments at gateways to beach residences. Such "old oysters" may serve as a useful object lessen.

by their study alone that we are enabled to recognize the true relationships of species and genera. Adult characters are frequently misleading and the similarity of two adults may suggest relationship, whereas the characters of the young of the respective individuals may indicate that they are entirely unrelated one to the other. This is not the place to enlarge upon the reasons which have convinced students of shells that relationships are more fully indicated by the young than by the adult. Suffice it to say that the young repeat the characters of the ancestor and that therefore identity in the characters of young individuals indicates community of descent, no matter how diverse the characters of the adults.

Young shells are common among the shell-sand and wrack near high tide mark, on shallow beaches, or in the protective angle of rocky ledges. Here they may be picked out from the broken fragments of larger shells. This should be done by spreading a mass of the shell-sand thinly upon a table, and then carefully picking out the young shells as well as the smaller species. Often these shells are worn, and are of little or no value, but in some situations the shells are merely swept together with a minimum amount of wear. The collector should look for specimens of the coiled gastropod shells with perfect tips—specimens with the embryonic shell or protoconch intact. These are the worthwhile shells, showing the minute apical coil, which is generally smooth, in perfect condition. Protoconch hunting is a fascinating occupation while resting from the tramp in search of adult shells along the shore. One needs a smooth board or table on which to spread the shell sand, a magnifying glass of moderate power, a pair of forceps or pincers, and many small phials or boxes (match boxes will serve) with cotton wool. These delicate shells must be protected; they must be bedded on cotton wool and covered with cotton wool to prevent movement and mutual attrition. Never put a shell with perfect apex loose in a bottle or box: never put it together with others. Be sure it rests snugly in a bed of cotton wool and is not disturbed by direct contact with other shells.

While protoconchs and young shell stages are best preserved in young shells, they are also sometimes found in full grown or adult shells. A perfect adult gastropod shell should always show the protoconch, but unfortunately the apical parts of most adult shells are broken or worn—or they are encrusted with other organisms. The collector should examine every shell when he finds it to see if it has a perfect apex. Indications of a perfect apex are apparent at a glance, but the actuality must be confirmed by the use of the magnifier. If the shell has a perfect apex, do not place it in the basket or box with the others but wrap it in cotton-wool and place in a separate receptacle, a phial or small box, of which the collector should always carry an adequate supply.

When the collection is brought to the laboratory, the shells should at once be roughly assorted, freed from sand, either by washing or brushing with a soft toothbrush, or, in the case of the small and delicate ones, with a camel's hair brush or Chinese writing brush. They should be stored in paper trays and labeled with the locality, date, and name of the collector, to which may be added any other information that seems pertinent.

Paper trays may easily be made from old envelopes, postcards or even stiff paper cut to postcard size. Fold over the long side of the card or paper, half an inch in width. Fold the ends over one inch in width. Pinch the corners of the box into right-angled triangles and bend them backwards against the ends of the box, then fold the projecting portion of the end down over the outside and the tray is ready

C. Cleaning of encrusted Shells.

Shells of mollusks which have died, and even those of living animals, often serve as a base of attachment for the young of bryozoan colonies, the spat of oysters, the larval barnacle and the young of other animals, which, after a period of floatation in the open waters of the bay, settle down to a life of permanent fixity upon the bottom of the sea. Sometimes the shell of a dead sea-snail or of an oyster is so fully overgrown by these squatters of the sea that their removal seems not worth the while. Sometimes indeed the residence of a tolerant host is so completely engulfed by his unbidden guests that his own individuality and that of his domicile become submerged beyond recognition. As a representative of his species the submerged individual is a failure, but as an example of the results of supine complacency he may form an interesting exhibit.* When, however, the encrustation has proceeded to only a moderate degree, hope of salvation may be entertained. Of course, if the individual is of a very common type, and shows no features of value, such salvation is hardly worth while and the specimen is best discarded. But, if the species is rare, or if the individual has unusual or interesting characters, it is worth while to use drastic measures to free it of the encrusting elements. Some specimens indeed well repay the collector for the labour spent on their restoration. We will deal with those epiliths in the order of the facility with which they are removed :

The easiest to remove are the baby oyster shells. Use an instrument with a sharp point, preferably a little bent (discarded dentist tools are most serviceable), put the sharp tip under the edge of the oyster shell or cluster of shells, then with a springing action of the fingers pry off the adhering young shells which will fly in all directions. Sometimes little bits will be left adhering rather tenaciously to the shell and these must be dealt with rather carefully. Carve them out with the sharp point of the instrument or with that of a big needle, following the direction of the striation or other markings on the shell surface of the host and finally clean the whole specimen with a wire brush. In the case of the barnacles, the bottom plate is the only part which offers much resistance, not only since it is unusually well cemented, but also because the side-plates of the barnacle preserve the base from the disintegrating influence of the sea-water. However, with patience and care, a specimen thus encrusted can ultimately be entirely restored to its original appearance. Those specimens that are covered over with *Bryozoa* are the most troublesome

*Large old oyster shells exhibit this conglomeration of types most effectively and make excellent ornaments at gateways to beach residences. Such "old oysters" may serve as a useful object lesson.

to clean, particularly if the animal matter of the guest is still present. In that case it is best to macerate the specimen by alternately drying and soaking it in fresh water. The crust may be so thick that one will have difficulty in recognizing the features of the original host, but fortunately the crust is not hard. The superficial layers can be dug off in lumps, but when the shell is nearly reached one must exercise considerable care not to damage the specimen. Scarify the encrustation lightly and thoroughly and brush with a wire brush, repeating the process as often as necessary. This is no doubt a slow process but in a rare specimen it is well worth the trouble. Beginners might first practice on a few common specimens and so acquire a proficiency in technique. A word of warning should be given against the use of acid, which undoubtedly will remove the extraneous material, but which is liable permanently to injure the specimen, since the epidermis, the protoconch, if still existent, and the finer parts of the sculpturing are bound to be eaten away by the acid at the same time.

D. Habits and Distribution of the Shell-bearing Organisms:

Practically all the shells found upon the shores at Peitaiho are those of animals which live upon the ocean bottom, either resting upon it or buried in the sand or mud. A few land or fresh-water shells are, however, often met with on the beach, having been washed from higher ground by heavy rains. Nearly all the gastropods or coiled shelled mollusks crawl about over the bottom of the ocean at a "snail's pace" and they are spoken of as moving or vagrant bottom animals or vagrant benthos (benthos=depths of the sea). The bivalve or pelecypod shells belong to animals which may move along slowly, partly buried in the sand or mud, or may lie buried in the mud with only the fleshy water tube or syphon projecting, as does the clam (*Mya* and *Anatina*) or the painted *Tapes*, or tapestry-shell. Again, these shells may be permanently attached to rocks or to other shells by cementation of the young shell, as is the habit of the oyster; or they may be attached to other shells or to the rock by a plug, as practiced by *Anomia*, or by a series of horny threads, which form the byssus, as is the habit of the mussels (*Mytilus*). Thousands of young of this form, together with barnacles, may be seen to cover the granite ledges which emerge at low tide. Some pelecypods also swim sporadically by clapping their valves together and forcing out a stream of water. Such are the pectens, whose antics may be watched in a pail of clear sea-water. A few pelecypods, especially the angel's wing, or *Pholas*, bore holes in rocks or in other shells and spend their lives in these holes. These animals generally have delicate shells. Other modes of life there are, but those mentioned are the most common. Some gastropods, too, lead a sedentary life, among them the limpets which cling firmly to rocks and move about only while feeding, or the crepidulas and chitons which cling to one another, to other shells or to stones.

Some of the principal factors which control the distribution of the mollusks in the sea are the nature of the bottom, the depth and amount of agitation of the water, the temperature and salinity of the water and, of course, the abundance of food supply and the freedom from enemies.

In Pechili Gulf the bottom is partly sand and partly composed of a mixture of fine sand and mud. Here and there are rock ledges but only the highest of these are free from a covering of sand or mud. The water of the entire bay is shallow, probably nowhere much over fifty feet in depth, and storms agitate it to the bottom. Temperature ranges are considerable, much ice forms in winter, hence many warm water species, such as are found off the south coast of China, are absent here. True Arctic species, however, are rare or absent altogether.

A most significant fact bearing on the distribution of species in the Gulf of Pechili, is the salinity of the water. By this is meant the amount of salts which are dissolved in a given quantity of water, more specifically the number of grams of salt in a liter or 1000 cc. of water. Since a thousand cc. of pure water weigh 1000 grams, the quantity is, roughly, so many grams per thousand, or, as it is expressed, so many per mille (abbreviated $\frac{o}{oo}$). In normal sea water there are approximately 35 grams of sea salts in every liter of water, that is, the salinity is 35 per mille ($35\frac{o}{oo}$). Of this, however, only about three-fourths is common salt (NaCl), the rest consisting of the salts of magnesium, potassium, calcium, etc. The combination produces the sea salts.

The salinity of the Gulf of Pechili is less than that of normal ocean water because this nearly enclosed water body receives the entire drainage of the Huang Ho basin, as well as that of some Manchurian rivers. Water obtained at Peitaiho in August 1925 was analysed in the chemical laboratory of the Geological Survey of China. The salinity was found to be only 25.54 per mille, i.e., a liter of water contained only 25.54 grams of salts instead of 35 grams as in normal sea water.

The difference in the character of the waters of Pechili Bay, (specifically that of the Peitaiho region) and that of normal sea water is strikingly brought out by a comparison of analyses as shown in the following table where the figures given for Peitaiho are the average of two analyses calculated to 100 per cent of the total salts.

	Percentage of Total Salts	
	Peitaiho	Normal ocean
Sodium Chloride ($NaCl$)	52.16	77.76
Magnesium chloride ($MgCl_2$)	32.59	10.88
Magnesium sulphate ($MgSO_4$)	9.46	4.74
Calcium suphate ($CaSo_4$)	—	3.60
Potassium sulphate (K_2So_4)	—	2.46
Magnesium carbonate ($MaCO_3$)	0.48	—
Calcium carbonate ($CaCO_3$)	4.04	0.34
Iron carbonate ($FeCO_3$)	0.70	—
Magnesium bromide ($MgBr_2$)	—	0.22
Silica (SiO_2)	0.21	—
Total	100.00	100.00

One of the striking features shown in this analysis is the low content of common salt (NaCl) and the large amount of magnesium chloride present. The amount of Epsom salts, or magnesium sulphate, is twice

as large as in normal sea water, while gypsum, or calcium sulphate, so characteristic of normal sea water, seems to be absent, the carbonate of lime ($CaCO_3$) on the other hand being high. These remarkable differences are due to the composition of the waters of the Huang Ho and other rivers, which bring in chiefly magesium and calcium salts which, mingling with those of the ocean water, produce the peculiar composition of the Peitaiho waters.

It is evident, of course, that such a difference in composition must affect the life of these waters, and so we find that many types of organisms common in the open sea are not found in Pechili Bay, while others are rare. Moreover the low salt content of these waters affects many of the animals which do live in these waters, so that very many of them never reach the size which they attain in the normal sea of this region.

E. How to obtain the shell-bearing and other marine animals from the deeper portion of the bay.

While the average collector of shells is forced to limit his efforts to picking up the specimens left by the retreating tide, the more enterprising student searches for them in their native haunts, which are often far from shore. To do this it is necessary to be equipped with special apparatus. Various kinds of nets, tangles and seines, such as the fishermen use, are serviceable for obtaining other forms of sea-life, but the only effective apparatus for obtaining the shell-bearing mollusks from the bottom of the bay is the dredge. A simple dredge, useful to depths of fifty fathoms (300 feet), can easily be constructed by any blacksmith. It consists of a rectangular frame of iron, about two feet long and one foot high. The longer sides are made of flat pieces of iron which project in a more or less flaring manner (See Fig. 1). The rope is attached to two iron arms which move readily on their attachment to the frame and which have eye-bolts at their free ends. The rope is firmly attached to one of these; the attachment to the other is by means of a smaller cord which will break when the dredge is caught by a rock or other

Fig. 1. The Naturalist's Dredge Net

obstruction on the bottom, and allow this obstruction to be avoided by a change in the direction of the dredge. A weight is fastened to the dredging rope about five feet from its junction with the dredge, to insure that the dredge is dragged along horizontally. The length of rope used must be longer than the depth of the water to be explored. The simple drifting of a large sail boat is force enough to work with such a dredge.

A fine-mesh net is fastened to the iron frame, and protected by a coarse canvas bag open at the bottom, which prevents the meshes from being torn. The length of time during which the dredge is left to drag across the bottom must be determined by experience.

When only the shells of the animals are desired, the soft parts may be easily removed by boiling the individual for a short time and extracting it with a pair of tweezers. If the animal is desired for study, it should be preserved in alcohol or formaline. The animal is dropped into a 70 per cent. solution of alcohol or a 2 per cent. solution of formaline. Of course the animal will contract when dropped into such a solution, which quickly kills it. If an expanded animal is desired, place the individual in a large dish of pure cold sea water and wait until it is fully expanded. Then slowly drop in small quantities of Epson salts (magnesium sulphate) until the animal is stunned. Then drop into alcohol or formaline. The length of time required and the rate and amount of material added must be determined for each type by experiment. Some forms are difficult to kill in an expanded condition and the beginner had best limit his activities to observation of the living animal, as it slowly crawls about on the sides of the aquarium. To keep the animals alive, do not put too many in the aquarium. Have some sea-weeds growing in the water, which must be kept cool and changed frequently.

(To be continued)

WITH RIFLE, GUN AND ROD IN MANCHURIA

BY

V. DE FRANCK.

A WILD BOAR HUNT.

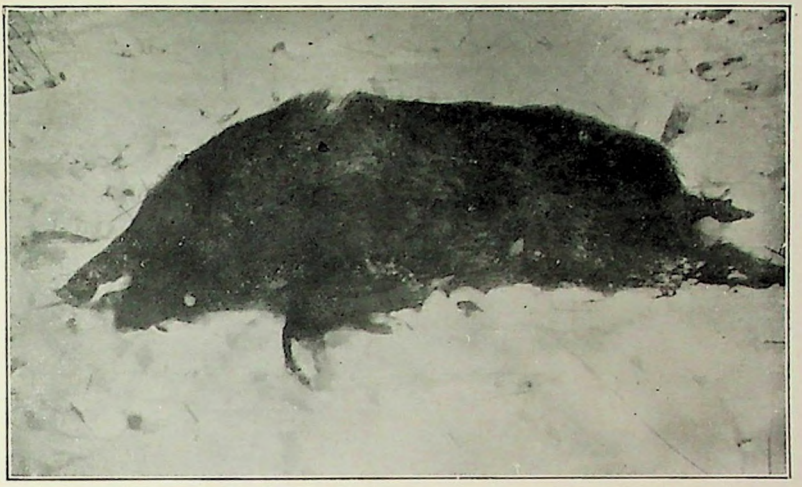
"When you go on a bear hunt, prepare a stretcher; when you go on a boar hunt, prepare a coffin," says an old Polish hunting proverb. True enough, at the time when this proverb originated, the modern high-power magazine rifle was yet unknown, and the hunter of yore faced bear and boar alike, armed only with a spear and dagger, but, when following the trail of a wounded boar through the dense jungle of the Manchurian hills, this caution of the old Polish hunters is well worth remembering.

In his little tent, safely hidden from storms and blizzard at the foot of a deep gulley, Peter M., a professional big-game hunter, was taking his ease. The red-hot tent stove was radiating a pleasant heat and from

the boiling pot on top of it the appetizing fumes of " pelmeni " (a Siberian winter dish) were rising temptingly. The sun was well up already, but in December boars are not early risers and continue their morning nap in the sun under some rocky ledge far into the afternoon. Moreover Peter was in a bad temper. Yesterday his rifle, a Winchester '95, had again misfired and then jammed, causing him the loss of a nice fat sow. He also had only a few cartridges left and these handmade, too, as, owing to the stringent measures of the Chinese authorities, the purchase of rifle ammunition had lately become extremely difficult. And with Christmas approaching, friends at Handaohedze were clamouring for meat. Well, he would see what kind of luck he would have to-day.

After a leisurely breakfast and a lengthy rest spent gazing at the deep-blue sky through the open flaps of the tent, the lengthening shadows on the snow showed it was time to start. *Brrr!* how cold it was outside, and the moving tree-tops indicated that a strong wind was blowing on the other side of the ridge. However this would make stalking easier. Shouldering his rifle, Peter started the ascent through the knee-deep snow. The day before he had found numerous boar tracks on the oak-covered southern slope of the ridge, and so, expecting to find the boars feeding in the same location again, he proceeded in that direction. Having topped the ridge, the full blast of the wind, loaded with needle-sharp snow particles, struck him in the face, but finding the fresh tracks made by a herd of boars which had waddled through a near-by snowdrift made him forget the sting of it. The southern slope, exposed to the sun, was practically bare of snow, and its present wind-swept condition made tracking out of the question. So, trusting the noise of the wind and the rustling of dry oak leaves to muffle the sounds of his footsteps, Peter proceeded along the ridge, keeping a sharp outlook.

Places where boars had fed were numerous, the large patches of freshly turned up oak-leaves showing bright yellow against the sober colouring of the ground and occasional stretches of snow, but still no signs of game. Then, when crossing a small ravine, a few black patches drew his attention. He saw near a large black rock that a patch had moved and now had shaped itself into the form of a fair-sized boar. Peter dropped to one knee, and, estimating the distance, raised his sights to two hundred yards. Suddenly the large black rock moved, too, and advanced several yards. This then was also a boar—he certainly was the great-grandfather of them all. Even at that distance the gleaming of his tusks could be discerned. Still unwilling to believe his eyes, Peter drew a bead on the great animal's shoulder, then shifted his aim higher —the handmade cartridges, which he was using usually had a tendency to shoot low—and pulled the trigger. However, this time his calculations proved wrong and the bullet went high, raising a small cloud of snow at the impact. At the report the boars froze in their tracks for a second and then, baffled by the echo, started towards the hunter. The largest boar became hidden from sight behind some intervening rocks and trees, but another acknowledged Peter's second shot, lunged forward, and then slowly went down-hill. The rest scurried for safety in every direction, like rats, without giving a chance for another shot.



A magnificent Wild Boar shot in the Forests of North Manchuria. This Animal turned on the Hunter and drove him to seek Refuge for several Hours in a Tree

Part of the Lower Jaw showing the fine Tusks of the Wild Boar shown in the above Picture

Peter arrived at the spot on the run, and, on a patch of snow which the boar had crossed, the bright-red drops of blood on both sides of the track testified that the bullet had passed through the body. Further, the fact that the animal had started down-hill proved that he was badly hit. Following the trail which skirted the base of the mountain and then turning into a side ravine, Peter soon came upon the boar, which was standing some hundred yards ahead, his large back showing above a clump of bushes. The shot, aimed presumably at the shoulder, was followed by a spasmodic jerk on the part of the boar, which then waddled on and disappeared from sight. Strangely, the boar seemed to be recovering strength and was gradually working up-hill keeping to the densely overgrown bottom of the ravine. Realizing the danger of following the wounded brute through the thick bushes, Peter set a parallel course keeping to the brow of the slope. He intended to cross the animal's tracks near the ridge, but, upon ascending, it became clear to Peter that the boar had remained inside the dense tangle and had evidently lain down.

The situation was becoming annoying. It was growing late and to leave the wounded animal until morning would mean either a weary chase, should he recover, or, should he succumb to his wounds overnight, his meat would go bad, as, not dressed, the large amount of fat would prevent the carcass from freezing. Reckless as usual, Peter decided to trust to his keen eye and quick aim. Releasing his hunting-knife, and with rifle held at half-cock, he started breaking through vines and devil-tree bushes. After skirting a large uprooted tree, he suddenly came upon the wounded creature. Some twenty yards away the boar stood facing him squarely, bloody froth dropping from his snout, his little eyes gleaming wickedly as he frantically worked his little curled tail propeller-wise. Then he charged. The bead of the front-sight was pointing to the base of the boar's neck when Peter pulled the trigger. With a loud squeal the boar stopped and executed a few quick gyrations. Peter worked the lever of his rifle, but at this crucial moment the action jammed. He had no time left for reflection as the boar charged again. Dropping down to his knee, with his right hand he reached for his knife and with his left holding the now useless rifle, barely managed to deflect the boar's head, the tusks clearing his side by a hairbreadth. So quick was the rush that he was able to strike only a glancing blow with the knife, which was then wrenched from his hand. The boar, having overshot his mark, unexpectedly turned his attention to the rifle, which had been knocked several yards away, and attacked it ferociously. Seizing this chance, Peter jumped up and started down-hill, having, however, slight hope of being able to out-distance his enemy in the dense tangle. The panting breath of the maddened brute sounded close on his heels, and so, choosing the first tree on his way, he jumped for safety. Only by drawing his legs up quickly did he escape a wicked slash of the tusks. Congratulating himself upon his lucky escape and feeling certain that in a few minutes the animal would tire and leave the battlefield, Peter felt no uneasiness about his position, although the thin tree he had climbed offered but a scant hold with its few frail branches near the top. The boar, meanwhile,

was working himself into a frenzy. Now he slashed at the bark, now he gnawed at the base, squealing and snorting the while. Some minutes passed. The wind pierced sharply through Peter's coat which hung in rags after his head-long flight through the tangle of devil-trees, and he began to feel a numbing sensation in his arms and legs. With one hand he loosened his belt and managed with great difficulty to loop it round the tree. He then drew himself up, and, inserting his arm in the noose up to the armpit, found his position a bit easier. The boar had retired a few steps and was lying panting in the snow, watching every movement. Dusk was falling rapidly and it was growing very cold. Minutes dragged on and the boar showed no sign of retiring. Peter's numbed legs refused to grip the trunk firmly and he slipped down, hanging with his arm in the noose. At this, the boar rose up and once again attacked the tree. With a tremendous effort Peter drew himself up—but soon felt his strength giving away completely while the intense cold sent shiver after shiver through him. Something must be done. To remain longer in the same position would mean to freeze to unconsciousness and then fall down an easy prey to his irate foe. With his free hand, Peter took off his heavy fur cap, and, waving it about to attract the attention of the animal which slowly came nearer, threw it as far as he could into the bushes. The ruse worked and the boar rushed towards that spot. Peter slipped down the trunk ready to start on a run, but his legs refused to hold him and he crumpled in a heap. The end had come. Weak and unarmed he was unable to offer any resistance and he seemed to feel already the cruel tusks tearing into his flesh. However, a few minutes passed and only the groans and snorts of the boar, busy tearing the cap to shreds, showed his nearness. With infinite pains, Peter began to rise slowly, holding himself to the trunk with both hands, and after a short while felt circulation returning to his limbs. He took a few hesitating steps forward. Still no sign of an attack. Having covered a short distance and recovered strength, Peter started on a run, pausing only once for breath before he reached the tent. Quickly he kindled a fire in the stove and put a kettle to boil. With the coming warmth he perceived that the left side of his face and nose, which had been exposed to the wind, felt lifeless and had lost sensitiveness to the touch. Realizing his predicament he fetched some snow and began to rub briskly the frozen portions of his face. After several pailfuls of snow had been used in this manner the burning pain told him the danger had passed and he was able to turn his attention to the boiling kettle. But after a few cups of tea had restored warmth to his inner self he felt a red, sullen wrath rising slowly within him. He, Peter M., who was considered the best shot and most reckless hunter of the region, had been chased about like a tenderfoot by a piece of pork, had had to roost in a tree, had lost his rifle and hunting-knife. Such thoughts were unbearable! His glance rested on the axe lying near the stove. Here was the weapon he needed to teach the brute a lesson. Quickly cutting a few notches in the handle for a firmer grip, Peter tied a towel round his head and started back to the abandoned battlefield. The moon had risen and by its silvery light he found it easy to follow his tracks. On nearing the fateful spot

his anger cooled off somewhat and he decided to try to find his rifle first, hoping to be able to work the jammed cartridge out. He picked up his in-going trail and, proceeding cautiously, reached the well-remembered uprooted tree. He grasped his axe firmly and took a few steps forward. On the snow a large black shape loomed vaguely. It was the boar. Was he dead or only shamming? Peter stamped his foot once, twice, but there was no sound or movement, so he went nearer. Across the broken rifle the lifeless body of his mighty antagonist lay in a large pool of frozen blood. With the last remnants of his strength the animal had dragged itself back, and, acting upon some obscure instinct, had wreaked its vengeance on the object which had inflicted the pain. For a long time Peter stood gazing wonderingly at the fallen giant, his feeling of wrath gradually giving way to one of admiration. The boar had been a mighty adversary, had fought a brave and gallant fight, and had died game to the last.

SOME WINTER BIRDS OF CENTRAL SHANTUNG

BY

R. H. LEFEVER

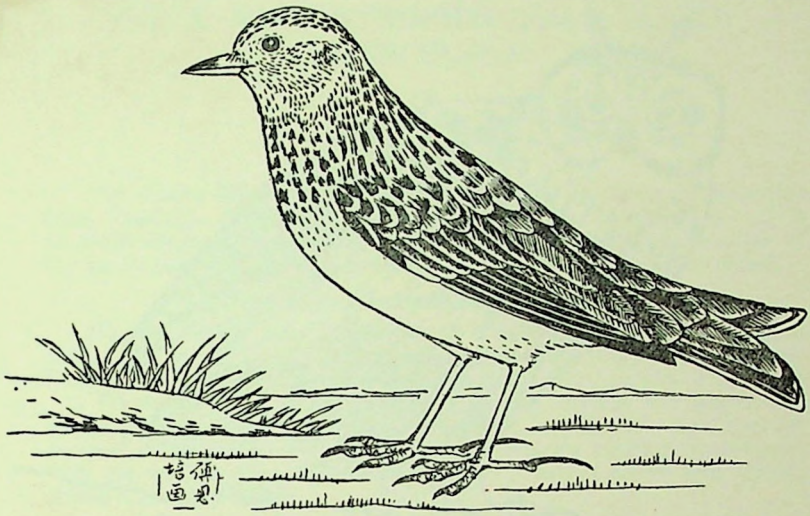
The following notes refer mainly to the big plain in Central Shantung. Several of the *Corvidae* spend the winter here. The white-necked crow (*Corvus torquatus*) is noticed between Central Shantung and Tsinanfu. As one leaves Tsinanfu the numbers grow less until one reaches the Weihsien district. I have seen only one pair at the latter place. The eastern rook (*Corvus frugilegus pastinator*) is found in flocks in Central Shantung all through the winter. In large flocks with the rook are found the jackdaws (*Coloeus dauuricus*). Both of these scatter in daytime for feeding and return at night to a common sleeping place. The magpie *(Pica pica sericea)* is always present, and flocks of the North China azure-winged magpies are numerous in the various villages and groves.

The Chihli greenfinch (*Chloris sinica tschiliensis*) is abundant from January to March. I remember seeing hundreds of them in the trees along the streams in the middle of January. The brambling (*Fringilla montifringilla*) is present from November to April. A few yellow-throated buntings (*Emberiza elegans*) stay here throughout the winter. The rustic

The Elegant or Yellow-throated Bunting (*Emberiza elegans*), which remains in small numbers in Shantung during the Winter, the majority continuing further South

bunting (*Emberiza rustica*) is especially abundant in February and March. Of course the common tree sparrows are always here.

The skylark (*Alauda arvensis pekinensis*) is found in large numbers all over Central Shantung. I have seen it in very large numbers up along the north seacoast on the open plain. Only once did I see Blakiston's water pipit (*Anthus spinoletta blakistoni*). This was a pair along a small stream. The Japanese titmouse (*Parus major actatus*) and the marsh tit (*Parus palustris hellmayri*) are both found in large numbers. Every one of the numerous little cedar groves seems to have several of these happy birds. I have counted as many as twenty-five in one grove.



The Chinese Sky Cark (*Alauda arvensis pekinensis*), which is very common on the Plains of Shantung and elsewhere in North and East China in Winter

Along the streams one sees little wrens (*Troglodytes troglodytes idius*). They come down from the high mountains during winter time and live in the small holes along the streams. Of the woodpeckers, the North China green woodpecker (*Picus canus zimmermani*) is quite plentiful. Members of this subspecies seem to lack the black streaks on the nape which the birds found elsewhere show. The Chinese great spotted woodpecker (*Dryobates major tschevskii*) is present all winter but very scattered and in small numbers.

The North China eagle owl is occasionally present, I am sure. Descriptions given me by Chinese indicate that this bird is sometimes found here. I have seen the long-eared owl (*Asio otus otus*) in February, and several specimens of the Eastern little owl (*Athene noctua plumipes*) throughout the winter. Among the falcons some Eastern merlins (*Falco columbaris insignis*) spend the winter in Shantung as do also some of the Eastern kestrels (*Falco tinnunculus japonensis*). There are a number of large hawks present, especially up on the northern coastal plain. I have never been able fully to identify these, but think there must be some kites and buzzards among them.

Along the broad open rivers many geese spend the winter, and are to be seen feeding in the wheat fields. They usually fly when one is a

The North China Eagle Owl (*Bubo bubo kiautschensis*, Reich). Though belonging more to the mountainous Areas, this Bird not infrequently descends to the Plains, where it may sometimes be seen in broad Daylight

mile away, so identification is difficult. I have secured specimens of the bean goose (*Anser fabalis fabalis*) in March, but other species are present. Of the duck family, I have seen the common teal (*Anas crecca crecca*) in December, the golden eye (*Bucephala clangula clangula*) the beginning of March. Other species also remain here for the winter. Quite a number of the groves have the Chinese spotted-neck dove (*Streptopelia chinensis chinensis*) living in them. There are bustards living in the wheat fields all through Shantung. Although there are a number of birds on this list, the plains of Shantung become rather barren and birds are not so numerous except at special places.

ON A NEW HYNOBIUS FROM SOUTH MANCHURIA

BY

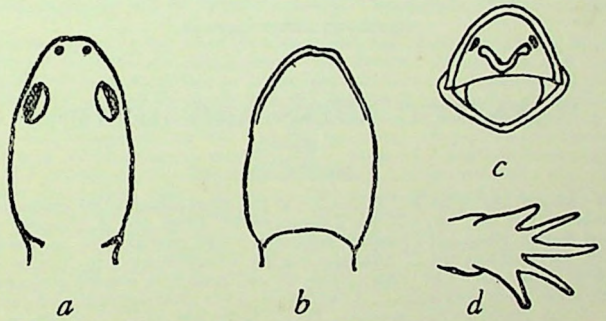
TAMEZO MORI.

Mr. Kaoru Mizuno has recently sent me a specimen of *Hynobius* from Yugakujo (熊岳城), South Manchuria, for identification. It is so much longer and narrower in the head than any other member of the genus that it appears to represent a new form. It may be called.

HYNOBIUS MANTCHURICUS SP. NOV.

Type: Adult male. Collected at Yugakujo, S. Manchuria, April 18th, 1926, by Mr. K. Mizuno, a teacher of Yugakujo Agricultural School. Preserved in the Preparatory Department of Keijo Imperial University.

Diagnosis: Head markedly elongate and slender, the length 0.64 in its width; snout rather long and acute; interorbital space narrow, series of palatine teeth typical, the length 1.9 in the width of the tongue; fifth toe well developed; tail rather short; keeled above and below; thirteen costal grooves.



Hynobius mantchuricus Mori.

a. Dorsal view of Head
b. Ventral view of Head
c. Open Month
d. Foot

(*All twice natural size*)

Description of type specimen: Head elongate, slender, and depressed; eye rather large, prominent, palatine teeth rather U-shaped than V-shaped, broader than length; body rather slender, distance from snout to gular fold contained less than three times in distance from gular fold to anterior end of vent; limbs not meeting when adpressed; tail rather

short, the distance from tip to anterior end of vent shorter than the latter point to end of snout, strongly compressed, keeled above and below, the upper keel originating almost opposite the posterior end of vent; skin smooth; thirteen costal grooves; a medium dorsal groove; gular fold strongly marked underneath.

Colour: Above uniform blackish brown with numerous blackish specks, and undersides pale gray.

		mm.
Dimensions:	Total length	93.0
	Tip of snout to anterior border of vent ..	49.5
	Anterior border of vent to tip of tail ..	43.5
	Tip of snout to gular fold	13.5
	Width of head	8.7
	Long diameter of eye	2.6
	Fore leg	12.0
	Hind leg	14.5
	Width of tail a head-length from vent ..	3.5
	Height of tail a head-length from vent ..	5.3

Remarks: This species is easily distinguished from *Hynobius nebulosus* by its longer and narrower head, and rather acute snout.

SCIENTIFIC NOTES AND REVIEWS

BIOLOGY

NEW MAMMALS FROM CHINA: In the *Proceedings of the Biological Society of Washington*, Vol. 39, pp. 137-40, December 27, 1926, Mr. A. Brazier Howell of the United States National Museum describes three new species of mammals discovered by Mr. Arthur de C. Sowerby on his expeditions into Fukien Province. These are a shrew and two bats. The shrew, which is named *Crocidura grisea* on account of its very grey colour, is described as the smallest of the all-grey Chinese members of the genus so far known. Its affinities are with *C. attenuata* of Milne-Edwards, from which it differs in size, having a relatively shorter cranium, while it lacks the brownish colour of the dorsal parts and has the flanks much darker. The colour is described as pure slate grey faintly grizzled above. The species is described from three specimens taken seventy-five miles south of Yenpingfu.

The two bats both belong to the genus *Myotis* and were taken on the same date in a cave near Yengpingfu, north-central Fukien. One has been named *Myotis sowerbyi* in honour of its discoverer, the other *Myotis hirsutus*. Of these, the former is described as resembling the European *M. mysticinus* in the skin and superficial characters of the skull, but is much darker in colour and more smoky, with no brown, and the membrane black instead of brown. A very distinct difference occurs in the dentition, the lower canine being no higher than the large first premolar and the second premolar being minute, instead of the canine being large and both premolars small as in *mysticinus* and *siligorensis* Hodgson, which two are regarded as almost if not entirely indistinguishable.

Myotis hirsutus is described as being close to *M. capacinii*, but differing in its duller and much darker colour, longer tail, shorter forearm, darker and narrower ear, slightly smaller skull and larger upper outer incisor. The species in colouration is comparable with *M. pequinius* Thomas from Chihli, North China, but differs markedly in size, being much smaller.

CHINESE BIRDS: Ornithological students in China will welcome the appearance of the first part of a list of Chinese birds which is being issued by the Peking Society of Natural History. It is called "A Tentative List of Chinese Birds," and is compiled by N. Gist Gee, Lacy I. Moffett and G. D. Wilder. It is high time that such a list was compiled, and it is to be hoped that it will form the basis of a more detailed and descriptive work upon the birds of this country which is badly needed. The present part includes well over four hundred and sixty species and sub-species ranging from the order Colymbiformes to the family *Picidae* of the order Coraciiformes. The classification and nomenclature are entirely up-to-date, English and Chinese names (the latter in Chinese characters only) being given in each case, as well as the classical one. The distribution and place records are also given. It is to be regretted that individual references to the original descriptions or to some more accessible work or works in which the species are described are not given, since this would have been of great assistance to the student.

A. DE C. S.

A NEW BOOK ON PLANTS FOR USE IN CHINA: Three years ago the English reading plant enthusiast rejoiced at the appearance of Liberty Hyde Bailey's "Manual of Cultivated Plants," with its eight hundred pages of keys, descriptions and terminology of all those plants we grow for pleasure or profit. This year we again have cause to rejoice over the appearance of a companion volume of nine hundred pages by Alfred Rehder entitled "Manual of Cultivated Trees and Shrubs."

Needless to say it is the most thorough and far reaching manual of its kind. To what extent it surplants Schneider's "Illustriertes Handbuch der Laubholzkunde," which appeared some fifteen years ago, will be appreciated by all those who have endeavoured to keep in touch with the hundreds of species of woody plants which have been described since then. Only those who have endeavoured to use the clumsy keys and typography of the German work can appreciate the beauty, ease of reference and compactness so well known to users of American manuals such as this one. The publishers, The Macmillan Company, are to be highly complimented on this latest production which places on one and a half inches of shelf space a systematic treatise on over six thousand forms of woody plants which may be cultivated for shade, ornament or use in the temperate zone.

Alfred Rehder, who for the past twenty years and more has devoted himself to the study of these plants, who has for years been studying the material which has poured into the Arnold Arboretum at Jamaica Plain, Massachusetts, and whose papers are familiar to those who have studied the woody plants of China, has, in this one volume, shared with all of us the fruitage of his rich experience, arduous zeal and detailed, painstaking researches. Those of us who know him as scientist and systematist, recognize his authorship as evidence of the greatest reliability and fairest judgment.

To all who live in China this book is unreservedly recommended as affording at once the most compact, authoritative and complete manual or key to the trees and shrubs of China. True, it does not describe them all; true certain genera of Chinese shrubs do not appear, as not being particularly desirable for cultivation, but no other book yet written includes them all. These omissions may, with little trouble, be added in the keys and margins, as they are determined. On page after page one sees the words, E. Asia, Korea, China. On page after page one finds such familiar and stirring words as *pohuashanensis, tianshanica, ichangensis, henryi, davidi, hookeriana, sinenses, thibetica, davurica*, and *japonicas* which should have been *chinenses*. Any wishing to identify the trees of his summer retreat or most of the bushes and possessing elementary knowledge of botany will find this volume a handy guide.

That there are no illustrations may be deemed a serious disappointment to the children. That there may be omissions of detail or typographic errors is to be hoped for, but search for them is more arduous than encouraging. The price is American, but—not too much.

A. P. J.

SEISMOLOGY

SERIOUS EARTHQUAKE IN JAPAN: On March 7th at 6:28 p.m. a severe earthquake lasting three minutes was experienced in Japan, its seismic centre being in North Tango in the Kyoto Prefecture about eighty miles north of Osaka. Very considerable damage was done both by the earthquake and subsequent fires, while latest reports put the loss of life at over three thousand and further casualties at somewhere near ten thousand. Houses and other buildings destroyed are placed at about ten thousand. Great distress is prevalent throughout the region effected, which involves Osaka, Kobe and other important towns. Mineyama appears to have been most affected, fully two-thirds of the town having been destroyed by fire. The Admiral Line steamer "California" on a world tour was moored to the wharf at Kobe when the quake took place, and the gangplank was shaken down, a passenger, Mrs. Hughes, being thrown off against the edge of the wharf and into the water and killed. Two other passengers were injured.

The earthquake is considered to be the severest since 1854, nor are there any records of a more severe one.

SEISMOLOGICAL STATISTICS FOR JAPAN IN 1926: The Tokyo Central Meteorological Observatory has issued the statistics in connection with earthquakes in Japan during 1926, from which it appears that no fewer than 4,913 earthquakes occurred during the year, showing a decrease of 384 as compared with 1925. From these statistics it appears that there has been a steady decrease in the number of earthquakes since the appalling disaster of 1923, due to a decrease in activity of the earthquake zones. The seismological condition in Japan is still abnormal, however.

CHEMISTRY AND PHYSICS

NEW ELEMENT DISCOVERED: It is reported from Rome that Professor Rolla, director of the Florence Chemical Institute, announced before the recent Congress of Scientists at Bologna that with the help of his assistant, Dr. Fernandes, and of Signorina Brunetti, he has succeeded in identifying and isolating the unknown element No. 61, to which he has given the name Florentium with Fr as the chemical symbol. The new element may be classed as one of the "rare earths," and its discovery was made possible mainly as a result of Professor Brunetti's previous discovery that these behaved differently one from the other when subjected to powerful X-rays.

MEDICINE

SYNTHETIC THYROXINE: According to recent advices from London, Professors Harington and Barger, two well-known British chemists, have succeeded in the synthetic production of thyroxine, which, as a natural product has been extracted from the thyroid gland. It is stated that the two scientists, working on the coal-tar products of iodine, have succeeded in imitating the most complicated process going on in the living cell, thus making a most momentous step in the progress of bio-chemistry. The synthetic throxine has been found to compete favourably with the natural extract in tests made upon human subjects.

A NEW DRUG FOR USE IN DIABETES: Another recent discovery in medicine is a new drug which it is claimed can be used as a substitute for insulin or as an auxiliary to it in relieving diabetes, its advantages being that its action is

Two Leopards shot in the Campus of the Fukien Christian University after an exciting Chase

slower and therefore it may be administered every three days instead of daily, and that it can be administered through the mouth instead of having to be injected subcutaneously as with insulin.

PLASMOCHIN V. QUININE: The chief disadvantage in the use of quinine as a specific against malaria is that it kills the white cells in the blood as well as the *plasmodia* of malaria. The advantage of plasmochin, the new cure for malaria which was recently made known to the medical world at the Congress at Dusseldorf, is that it does not hurt the white cells but kills only the plasmodia. It is thus probably the most important discovery in chemo-therapy since Erlich's salvarsan and the more recent remedy against sleeping-sickness known as "Bayer 205."

A. DE C. S.

SHOOTING AND FISHING NOTES

SHOOTING

LEOPARD HUNTING ON THE CAMPUS OF THE FUKIEN CHRISTIAN UNIVERSITY, FOOCHOW: Not every college is able to furnish the sport of leopard hunting to its faculty and students, nor can every school museum boast among its specimens a leopard shot on its own grounds. The Zoological Museum of the Fukien Christian University has just acquired the skin of a leopard killed on the school property and shot within seventy-five yards of two of the faculty residences.

One of the grounds inspectors while on his rounds of the water pipes in a ravine at the back of the University was startled to see a leopard leap off the path ahead of him. He hastened breathlessly down the hill to report his experience, and immediately from library, laboratories and class rooms poured the faculty and students, every one talking at once and adding to the excitement and confusion. Only two guns could be mustered, a native muzzle-loader and a twelve gauge double-barreled shotgun, and with these two weapons two of the servants accompanied by a faithful dog, went to the attack. While the hunters worked the ravine, unarmed students swarmed over the hillsides, throwing stones into brush heaps and poking into hollows. Finally a leopard was sighted and wounded by one of the guns, when it was attacked by the dog and forced on its back into a pocket between two rocks. By this time one of the professors had come up with his revolver and another one with a bow and arrow, and, while they stood waiting for a chance to shoot the leopard, the cook with the shotgun crept up to within a few feet of the fighting animals and fired. The shot at this close range went through the neck of the leopard like a rifle bullet, killing it instantly, and also struck the dog, wounding it so severely that it had to be shot. Further hunting discovered another leopard and after an exciting chase it was cornered in a cave and soon killed. The two leopards were young ones weighing fifty to sixty pounds each.

For nearly a week, night after night, the mother leopard came back calling for her cubs, the low calling and savage growls being distinctly heard all over the campus, waking up some of the lighter sleepers among the students and faculty. Night watchmen refused to go on their rounds in that part of the campus, and when it was necessary to go out at night people travelled in groups. Every night at dark would come the rolling angry growling of the big cat, as it walked up and down the ravine looking for its young. Members of the faculty spent several nights on the veranda of one of the faculty homes and could plainly hear the animal coughing and growling in the dark on the trail within seventy-five yards of the house, but the intense darkness prevented its being seen. Footprints found in the daytime verified its presence.

One night when the moon came out, two of the faculty men and a native hunter spent several hours in the ravine, hidden in some brush on the hillside, but the

animal did not come out. Although the calling stopped after that night, the disappearance of dogs in the neighbouring villages testifies to the continued presence of the beast in the vicinity, but it is altogether too clever to be found by the hunters, who have made many unsuccessful attempts to discover it.

C. R. KELLOGG.

HOUSEBOATING DE LUXE: What is probably the most luxurious and well equipped houseboat that has ever been built or owned in Shanghai is that belonging to Colonel M. H. Logan of Palmer & Turner, Shanghai, which has recently been completed and put into commission. The name of this vessel is the "Olive," and it is a twin-screw motor houseboat fitted up with every modern convenience, and designed not only for the inland canals and waterways of Kiangsu Province but also for navigation on the open waters of the Yangtze River where it not infrequently runs a high sea, far too high for the ordinary houseboat. The "Olive" is 65 feet over all in length, 13 feet 6 inches in beam, has a moulded depth of 5 feet 9 inches, a draft of 3 feet, and a registered tonnage of 32.89. The engine room is slightly forward of amidships, the propelling power being supplied by two four-cylinder "Kelvin" sleeve-valve engines, each developing 36 horse-power at 950 revolutions per minute. In the forward end of the engine room is a "Petter" self contained .75 kw. electric lighting set, while "Westinghouse" non-spillable accumulators are equally distributed on either side. On the port side of the houseboat is a refrigerator. Main tanks under the aft deck capable of carrying fuel for 500 miles supply two gravity-feeding fuel tanks on the aft bulkhead. On the starboard side hot water radiators behind grills are situated. Hot water for baths and washing is laid on from the boiler, whose chimney, together with that of the stove, leads to the funnel, which makes the houseboat look like a miniature steamer. Cooking, heating and sanitary appliances were installed by Gordon & Co. of Shanghai. The saloon and cabins are beautifully paneled, while the bathroom has tiled walls and a marble floor.

The "Olive" on her trials which took place in February proved completely successful and a credit to her designer, Mr. F. Wells Henderson. She runs a good 9 knots an hour and looks like a miniature "Empress" liner.

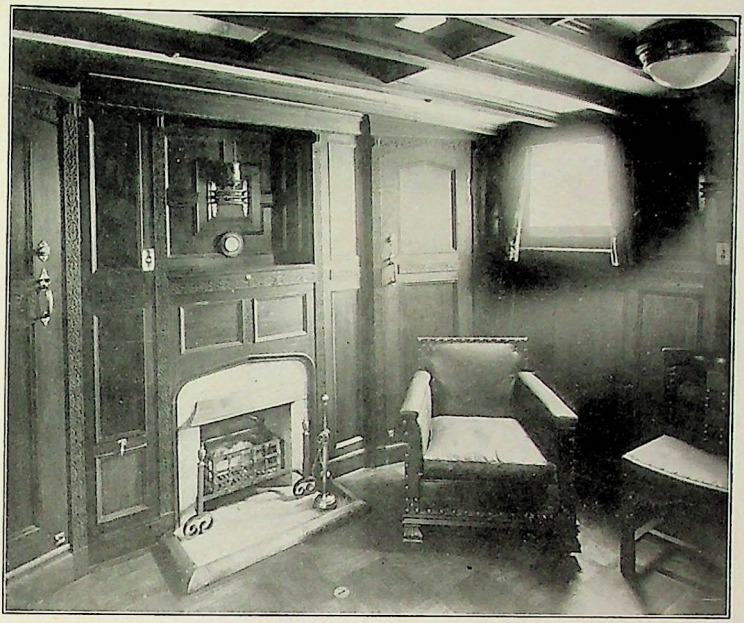
A. DE C. S.

SHOOTING IN MANCHURIA, APRIL NOTES: On the wings of the incoming hordes of geese, ducks and other migratory fowls, spring has made its entry into Manchuria. To the big-game hunter this means the end of his sport unless he wishes to have a last go at bear, which, hungry and lean after the long months of winter hibernation, now roam about wild and wide, here picking up an old acorn, there nibbling at a tuft of green grass which has made a timid appearance on some southern slope. Their pelts are prime and would make a fine trophy.

The extensive cultivation of the land and drainage of marshes, especially in the region of Tsitsihar which was a favourite resting place of the migratory fowls on their flight to the north, seems to have induced them to make some change in their route, and so geese and duck shooting has been growing worse from year to year. If one wishes to get good sport one has to travel some distance from Tsitsihar or go into Mongolia from Hailar.

But to the man with the shotgun, spring in Manchuria offers other allurements. By the latter part of April, the valleys and glens in the Hingan Mountains resound morning and evening with the *mumble-mumble* and *chuff-chuffee* of love-sick blackcock. An hour or two spent in a blind watching the amusing capers and antics of a score or more of these pretty blue-black birds will gladden the heart of even a hypochondriac, besides providing one with tasty game, as the flesh of blackcock in spring possesses a special flavour from the birch and aspen buds which form their principal food. Excellent blackcock *toks* (meeting places) are to be found in the vicinity of Halasu, Barim, Buhedu and Irekte stations.

By the end of the month, higher up in the larch woods of the Hingan ranges the first clicks of a capercalsie's love-song will be heard. Stalking this beautiful and wary bird is royal sport indeed. But capercalsie *toks* are sparse in Manchuria, and one must travel far from the railway line to reach them. Some fine *toks* are situated on



The Saloon of Colonel M. H. Logan's new Motor Houseboat "Olive"

By Courtesy of Henderson's Magazine

The Double Stateroom on the Motor Houseboat "Olive"

the river Tchol and can be reached in about a day and a half's travel by cart from Buhedu Station. Smaller *toks* are to be found some forty miles from Hingan station.

Fishermen would do well to go through their tackle and see if it needs repair or replenishment as their turn will come soon.

FISHING

THE "SAWARA": The following letter has been received from a Canton correspondent, and will undoubtedly prove of interest to many of our readers. Unfortunately, the information that the "Sawara" are similar to what are known as the Canton "salmon" does not help us much in identifying these fish, since most of us are equally ignorant of the appearance of a Canton "salmon," but from the fact that they are good sport, weigh up to forty pounds and frequently jump from the water, we conclude that they are probably one of the large mackerels that inhabit these waters.

DEAR MR. EDITOR,—In your February number under the heading Scientific Notes and Reviews (page 101) you mention an account of a "herd of dolphins" in Dairen Bay which appeared to be in pursuit of a shoal of "Sawara" *whatever that may be.*

For your information "Sawara" or "Sara" are large fish very similar to what is known near Hongkong as Canton salmon. They are very good sport and run from 10 to 40 lbs. or so. In the middle of the Shimonoseki Straits where they are frequently seen jumping I have endeavoured to catch them from *sampans* towed by launch, using as bait a large spoon, but I was never successful. When hooked they give sport almost equal to the tunny.

Foreigners do not consider their flesh very palatable though the Japanese like it quite well.

Yours truly,

WILLIAM GALLOWAY.

Canton, February 17, 1927.

THE KENNEL

THE WOLF STRAIN IN ALSATIANS: The following letter upon this highly controversial subject has been received, and we give it here together with some of our own views.

TO THE EDITOR,
The China Journal.

SIR,—I should be greatly obliged if you could find space in your next issue for the following regarding the above subject.

I replied to the article which appeared in the "North China Daily News" from the "Manchester Guardian" because I knew it for stupid propaganda and ridiculous nonsense. I was therefore very much surprised to see the same subject taken up seriously in your January and February issues. Quoting from your February number "We cannot agree with Mr. P. H. Duncan, who, in his letter appearing in the *North China Daily News* on January 17th, claims the entire absence of wolf blood in the Alsatian, since his contention is based on what, as far as we know, is a fallacy, namely that the offspring of a wolf and dog cross is sterile. We believe this statement is contrary to fact." In my letter referred to above there was no contention. I merely stated the fact that there is no wolf strain in the thorough-bred Alsatian; and quoted, by way of information, an article from the *Dog World*. Whether or not a wolf mongrel is sterile I am not prepared to argue for I am quite sure that neither you nor I could prove this point. It was unfortunate that you missed the point of the article, *i.e.* "the blood of the wolf must be thin among 740,288 dogs."

But for facts regarding the Alsatian I can state that the Alsatian had his origin in Germany and was registered as a breed in 1899 under the name Deutsche Schäferhund (German Shepherd Dog). In England the breed was not registered till 1919, and from patriotic reasons the name " German Shepherd Dog " was changed to " Alsatian Wolfdog," although the dogs which started the breed in England were, of course, imported from Germany and registered there with the " Verein für Deutsche Schäferhunde." For some ten years previous to 1899 a few earnest breeders had tried to establish a distinct breed from the widely differing German sheep dogs. A uniform type was reached in 1899, and the first dog to come up to the fixed standard was Horand von Grafrath, registered as SZ 1 ; he and his son, Hektor von Schwaben SZ 13, and the latter's son, Beowulf-Sonnenberg SZ 10, together with a few other dogs of different strain, are the pillars of the breed. Any thorough-bred Alsatian of today (registered dog) can be traced back to one of these dogs, including, for local colour, Mr. Neumann's Blitz von Leipzigerhof SZ 82050, Mr. Schönherr's Klaus von Warnowtal SZ 184885 and my own dog, Gerwin von Blautal SZ 322117, and in fact any other thorough-bred Alsatian. There is absolutely no wolf blood in such dogs, for each sire and dam can be traced by name and number back to the very beginning.

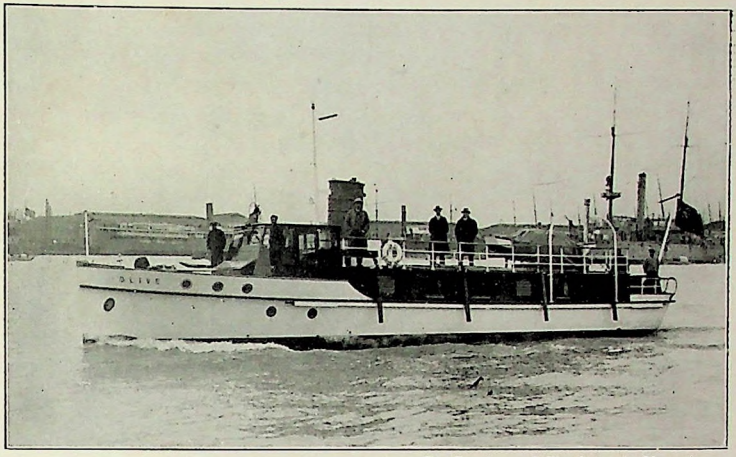
Prior to 1899 the breed was well known in Germany as a working dog and was used extensively by the German shepherds. The appearance of these dogs was irregular, soft ears and bad tails predominating, and their structure much inferior to present-day standards. No breed has been so scientifically developed as the Alsatian, and as a working dog it far surpasses any other breed today. Their staunch character and dependability, which inspired a few breeders in 1899 to start the German Shepherd Dog Club, has been so greatly improved that an Alsatian of today is a peer of dogdom.

All authorities on the breed state absolutely that there was no wolf cross in the old stock prior to their registration. But for the most sceptical and to show how ridiculous such an assumption is, I will quote the *Dog World* again : " Taking it as probable that at some time or other the cross was accomplished, it must have been at so remote a period as to cover twenty or more generations prior to our present generation. This much, anyone must admit, for if there ever was a cross, it has not been repeated during the past fifteen or twenty years. Just consider the figures involved. In twenty generations removed, the progenitors number 740,288 individuals. Assuming that one of these was a wolf, he must havé been a remarkably prepotent wolf to stamp his characteristics upon his descendants through a 740,288 infusion of his blood. It is so utterly absurd that one cannot consider it at all. Another fact which makes it ridiculous to claim that the modern Shepherd Dog is a result of a wolf-canine cross lies in a second biological barrier of such a hybridization. In the canine eye the pupil is circular while in that of the wolf it is oblique—and there is no combining the two forms ; so if the cross actually were established it would, as proven by the Mendelian laws, get at least a proportion of shepherd dogs with oblique eyes. Has anyone ever seen a pedigreed, registered shepherd dog with such eyes ? The propaganda of the shepherd dog-wolf cross has its sole foundation on the similarity in the shape of the ears of both species, and, to a degree, in the likeness of colour in some shepherd dogs to that of all wolves."

Of course some few individuals have tried crossing the Alsatian with the wolf, but their get could be nothing other than wolf mongrels and therefore could never have been registered. Such experiments could therefore have no more to do with the breed than a cross between a fox terrier and an Alsatian.

I do not agree with you regarding the animals seen in Shanghai being the result experimental inter-breeding between Alsatians and wolves. Where would the wolves come from ? One can put a finger on all of the imported Alsatians and their pedigree. From the looks of the big majority of so-called Alsatians bred in Shanghai their ancestral tree might readily be questioned, but I am sure that no wolf is to blame for their unsymmetrical appearance, which is entirely due to accidental matings with other breeds.

You will find that those who claim that there is a wolf strain in the Alsatian are without exception people who know nothing whatsoever about the breed. For instance, you say in your February issue " to get an animal so like a wolf in colour, form and habits as an Alsatian undoubtedly is, we suggest that the wolf strain



By Courtesy of Henderson's Magazine

Colonel M. H. Logan's Twin-screw Motor Houseboat "Olive" on her recent trials on the Whangpoo, Shanghai

Hamilton Erich von Grafenwerth, P. H. Grand Champion of all Champions at the Shepherd Dog Speciality Show in 1922 by Dr. Rosebeck, the eminent German Authority. International Grand Champion and Grand Champion of Germany in 1920, and Champion of U. S. A. in 1922

must have been greatly increased and now predominates over that of the wild dog." Such a statement shows me that you know absolutely nothing about Alsatians. In stating that the wolf strain must have been greatly increased you must be referring to the Alsatian as a breed which covers a period of some forty years. Now in connecting that up with the wild dog you are nonchalantly jumping back about ten thousand years to the stone age. Almost anyone knows that all dogs are descendent from the wolf about some ten or twenty thousand years ago, but that has nothing to do with the point under discussion and can in no way be connected with any particular breed. Now (coming back to life) in speaking of colour, form and habits of the Alsatian we are referring to the last forty years. As to colour, eighty per cent. of the thorough-bred Alsatians are black, or black with cream, tan or grey markings. How does the colour then resemble that of the wolf ? The form : I enclose a picture of Erich von Grafenwerth SZ 71141. Erich is the best of the breed living or dead, being himself International Grand Champion, Grand Champion of Germany and Grand Champion of the U. S. A. and having sired more champions than any other dog. He is, in other words, what an Alsatian should be like. Compare his picture with that of a wolf. It would be hard to find a more ill-mated pair. Habits : I cannot connect the habits of a wild animal with those of a domesticated one as their environment and daily life would make it impossible, therefore I take it that by habits you mean character. The splendid character of the Alsatian has made him the most popular dog of today—courageous, affectionate, dependable and intelligent. I have handled about a hundred of these dogs, and I have yet to find any sign of a wolf, that is a treacherous, nature in any Alsatian, and I have yet to find an Alsatian owner who has.

THE KENNEL : I hope to see this part of your magazine enlarged. The Shanghai fancy is in need of a dog publication, and I believe that there are enough local people interested in dogs to develop this part of the China Journal into an independent publication, if you could get the co-operation of people who are thoroughly conversant with the breed they write about, or, if this is impossible, rewrites on the various breeds from well-known dog publications, so that the Shanghai public would not have to depend upon the opinion of the novice for information.

Yours, etc.

133 Route Courbet. P. H. DUNCAN.

In offering a few remarks upon Mr. Duncan's letter we would say that one point we disagree with most emphatically is the statement that all dogs are descended from the wolf some twenty-thousand years ago. There is absolutely no support of this statement. On the contrary, the remains of the dog that are found in the camp sites of prehistoric man in Europe are those of the wild dog *Cyon alpinus*, which has become extinct in Europe except in the domestic form, and, as far as we know, no remains of the wolf have been found in prehistoric camp sites, although there is a drawing made by prehistoric man in one of the famous cave sites of what is undoubtedly a wolf.

Another point which we would like to make is in reference to the statement that the wolf blood, if ever it was there, must be very thin in the veins of the present day Alsatians. We do not quite see what is meant by this, for if the present Alsatian is the result, no matter how far back, of a cross between the dog and the wolf, there is no reason why there should be any more dog blood in the present generation than wolf blood, unless the original cross was continually recrossed with pure dog. The presumption is that if this particular type of dog was produced by a cross between wolf and dog, that mating was brought about between cross breed and cross breed, in which case all the offspring would retain the same proportion of wolf blood and dog blood.

Mr. Duncan states that we know nothing about Alsatians because we say they present wolf qualities. We might reply that we know a good deal about wolves and we see a great deal of resemblance in Alsatians to wolves in the way they move and their general actions. This has recently been confirmed by a British officier now in Shanghai who has done much hunting in India and elsewhere, and who has also kept Alsatians. We have kept wolves as pets and, provided they were obtained young enough and brought up in the house with dogs, their dispositions were as pleasant as that of any Alsatian dog, showing exactly the same extraordinary fond-

ness for their own master, being essentially one-man animals. There is at the present moment in the Shanghai Museum a skin of an Alsatian which was sent to be tanned and we can guarantee that if it were shown to a person who knew wolves and did not know of the existence of Alsatians, he would immediately say it was a wolf skin. We also have the skin of a wild dog of North China which on no account could be mistaken for a wolf. With reference to the true Alsatian being black, we may say that amongst wolves very dark specimens not infrequently occur. In fact, the tendency to black on the body in the Alsatian is probably directly derived from the wolf, since in this particular area of the wolf's body the tips of the hairs are black. The pattern of the Alsatian's colouring is also very close to that of the wolf. Failing the presence of wolf blood in the Alsatian, it is extremely difficult to account for the above facts.

A. DE C. S.

THE GARDEN

DAFFODILS OR "LENT LILIES": Botanically, all daffodils are narcissuses although until recently the name daffodil was limited to the large flowered types, and the small and cluster flowered types were known as narcissus. The origin of the name "daffodil," which has been in use for centuries in England is doubtful. Various theories have been advanced as to how it was derived, but none are really convincing. The most feasible is that it is a corruption of "day lily," a name now applied to *Anthericum*.

Daffodils have pride of place amongst spring flowering plants, having ousted the early flowering tulip, which for a long period flaunted itself as the chief April flower.

Locally, the daffodil has everything in its favour. Its cultivation is simplicity itself. Unlike many bulbs, when imported it arrives in good condition. When planted, the bulbs increase rapidly, and, beyond a slight topdressing of well decayed farmyard manure and bone meal every winter, and lifting and dividing once in three years, nothing further is required. Planted in turf where they appear to best advantage they are inclined to grow weak after a few years, but as there is always a surplus in the beds, where a certain amount are usually grown, they are available to replenish the lawn groups which have become weak. Although fancy prices, such as sixty guineas for one bulb of the variety "Peter Barr" for example, have been paid, standard varieties of first merit, such as Emperor and Empress, Horsefield and Sir Watkin, are cheap, about £7 per thousand. Planting is best if accomplished in September and October, the bulbs being planted at a depth of from three to six inches. After flowering, the foliage should not be removed until it is perfectly ripe.

NARCISSUS, Nat. Ord. *Amaryllidaceae*: Various classifications have been evolved for this genus, but the following is possibly the most explicit:—

SECTION MAGNICORONATA.

Flowers possessing trumpets longer than the perianth segments

I. Corbularia
(*a*) typical species *N. bulbocodium*

II. Ajax
(*b*) *N. Pseudo-narcissus*

MEDICORONATA

Flowers possessing trumpets as short or shorter than the perianth segments:

I. Ganymedes
(*c*) *N. catathenus*

II. Queltia
(*d*) *N. incomparabilis*

PARVICORONATA.

Flowers in which the trumpet is shorter than the perianth segments:

I. Hermsione
(*e*) *N. tazetta*

II. Eunarcissus
(*f*) *N. poeticus*

III. Aurelia
(*g*) *N. broussonetii*

(*a*) *N. bulbocodium.* "The Hoop Petticoat Narcissus," so called from the shape of the trumpet, which is narrow like a waist at the end of attachment with the perianth segments and flows out into a wide frilled apex or mouth. Flower scapes four to eight inches in height each bearing solitary flowers erect or horizontal.

There are various varieties differing chiefly in colour which is golden, primrose to white. It is an early free flowering plant, which may be used to advantage, if grown in cold frame, in pots, five bulbs in a five inch pot.

(*b*) *N. pseudo-narcissus.* "The English Daffodil," found wild all over England and north to Fifeshire in Scotland. All large flowered long trumpet daffodils are included under this heading. The typical species is a dwarf type with small flowers, when compared with modern garden raised varieties, and thrives best when planted in semi-shaded pastures. Varieties are usually classed under three headings. (1) Yellow, self coloured "Emperor," "King Alfred" Maximus and (2) Bicolor, trumpet yellow, perianth segments white or light coloured, examples, "Empress," "Madame Plimp," "Victoria," "Weardale Perfection," and "Horsefield." (3) White of sulphur coloured: examples are:—"Madame de Greaf," "Mrs. Thompson," "Wm. Goldring." Double forms included under this group are *pseudo-narcissus, plenus* and *grandi-plenus.*

N. incomparabilis. Chalice Daffodils. Varieties in this section are:—"Autocrat," C. J. Backhouse, Sir Watkin (one of the best), "Gloria Mundi," "Will Scarlet." Sub-section, *Leedsii,* flowers having white perianths with sulphur, yellow or white trumpets. Varieties, "Mrs. Langtry," "Queen of England, "Queen of the North."

Double flowered varieties are:—"Eggs and Bacon, "*N. albusplenus*; Butter and Eggs, *N. albus auranticus*; and "Codling and Cream," *N. albus,* var.

N. tazetta. Polyanthes Narcissus. The varieties included under this heading bear flowers in clusters on the summit of the flower scape. The best known are *N. papyraceus* the "Paper White Narcissus" which in Europe is used in large quantities for forcing early into flower. *N. orientalis* "Chinese Narcissus" or "Water Fairy Flower." The members of this species are considered to be natives of Spain and Portugal, hence some writers have assumed that the Chinese species might possibly not be a native of China, but was introduced by the early Portuguese settlers. This belief is founded on the statement that the species is not mentioned in Chinese books prior to the arrival of the Portuguese.

N. jonquilla. "Jonquil." One of the best species is *N. juncifolia,* bearing two to three golden flowers on each scape, very fragrant, leaves rush-like.

N. poeticus. "Poet's Narcissus." Pheasant-eye Narcissus, a delightful and fragrant species, with pure white flowers possessing a reddish rim around the top of the short trumpet, has given origin to many varieties of which the following are the best. "Ornatus," "Poetarum," "Recurvus," and "Tripodalis." It has been used in the production of a number of hybrids. Its double form is *Pœticus-plenus.* The gardenia-flowered narcissus is an old favourite, being grown in pastures. It flowers in May in England and in June in the north of Scotland with the result that there is a great demand for the flowers from the north for marriages, which are rarely solemnized during May.

N. Broussonetii. A greenish white flowering species which is not generally cultivated. It bears four to eight flowers on the scape.

In addition to the above there are numerous classes of hybrids, such as *Poetaz,* hybrids between *Polyanthes* × *poeticus. Barrii, pseudo-narcissus* × *poeticus Leedsii, Pseudo-narcissus* × *nontanua.*

BORDER PLANTS AND PERENNIALS: Seed of plants for embellishing flower beds and borders during the summer months that may be sown out-of-doors early this month are :—*Abutilon, Acrocli- num, Ageratum, Amaranthus, Aster, Balsam, Begonia, Browallia, Campanula, Celosia,* Cockscomb, *Coleus, Convolvulus, Cosmos, Datura, Gaillardia, Geranium, Gerbera, Gomphrena,* Gourds, *Hibiscus, Impatiens, Lavatera, Lobelia* (dwarf), African Marigold, *Mimosa, Nasturtium, Nemesia, Nicotiana, Oxalis, Petunia, Portulaca,* Mignonette, *Rhodanthus, Rivinia, Solamun, Sunflower, Thunbergia, Torenia, Vinca rosea, Zinnia.*

The following biennials and perennials which will flower next year, may be sown :—*Aralia, Ciwskuo, Eucalyptus,* Ferns, *Francoa,* Hollyhock, *Lobelia* (tall), *Salvia,* Canterberry Bells.

SEED SOWING. Prior to sowing seed, the soil of the seed beds must be thoroughly pulverized by free use of hoe and rake, especially the surface two inches, and a dressing of pulverized vegetable refuse or leaf soil incorporated. The humus thus incorporated renders the soil more porous and assists in retaining moisture. If the weather is dry, thoroughly water the bed twenty-four hours before sowing seed. Sow to a depth equal to twice the diameter of the seed. Thus, for tobacco a slight depression made with a rod is sufficient, whilst for beans a depth of two inches is required. After sowing, firm the soil with the back of the spade, taking care that it is all of equal firmness. If this is not attended to the soil around the seed will not it be able to draw its necessary supply of moisture from the adjoining soil as they will be of different degrees of consistency. The result will be that the soil around the seed will dry quickly and the seed perish. If the seed has begun to germinate, failure due to lack of moisture from the above cause, is frequent and the seedmen will be blamed for supplying old seed. Where the seed bed is required only for raising seedlings, which will later be planted in their permanent positions, it is not advisable to add any manure.

Vegetable seeds to sow during the month are :—Cabbage-lettuce, sow a little every two weeks up to the end of May ; Climbing and bush Kidney Beans, sow afterwards every month till the end of September ; Parsnips, Beets (round), Carrots (early), Spinach (summer and New Zealand), Parsley, Cauliflower (autumn giant), Broccoli in variety, Artichokes (globe), Eggplant, Tomatoes, Gourds, Leeks, Vegetable Marrow, Maize or Corn, Okra, Salsify, Turnips, Swiss Chard, Brussels Sprouts, Cucumbers, Butter or Lima Beans and Onions (to be used in young state). Mustard and Cress may be sown weekly and Radishes every two weeks. In case these are to grow to maturity the soil requires to be well manured, and dug to a depth of at least eighteen inches.

D. MacGregor.

CHINESE CUCUMBER DISEASE RESISTING: Of considerable interest to the grower of cucumbers in the United States of America are the results of experiments carried out in regard to the Chinese cucumber both in this country and at the Iowa Agricultural Experiment station. Observations made for two years in China by Mr. R. H. Porter, plant pathologist of the University of Nanking, indicated that the Chinese cucumber is entirely free from the disease known as "mosaic." He accordingly sent seeds to America, where they were grown and the plants subjected to tests as to their immunity, or otherwise, against mosaic, which, as is well known, is a severe and destructive disease prevalent throughout the United States. It was found that they remained free from the disease throughout the season. The importance of this discovery is very considerable, since, in the words of Dr. Melhus, who reported upon the experiments carried out in Iowa, "nothing has happened to the cucumber mosaic problem since the disease was first found which bids fairer to the future of mosaic control than the finding of this new variety." Doubtless by a process of careful crossing and selection of American varieties of cucumber with the Chinese form, mosaic disease in the United States may be practically if not entirely eradicated.

A. de C. S.

Members of the Natural History Club of the Fukien Christian University, Foochow

SOCIETIES AND INSTITUTIONS

PEKING INSTITUTE OF FINE ARTS

The Peking Institute of Fine Arts during the last month or two has had a very interesting program, including among other things art exhibits, concerts, and a number of lectures upon various subjects. "The Jews of China" was the title of a lecture given on February 28 by Mr. Mitrophanow. The speaker told of the origin of the Jewish colonies in China, their evolution through the centuries and their "rediscovery" by the early Catholic fathers, and explained why they have practically disappeared from China to-day. On March 7 Dr. M. E. R. F. Meerkerk spoke on "The Theatre." Mr. Benjamin March gave a series of lectures, the last one occurring on March 8, on "Efficient Photography" which has been very helpful and has done much to stimulate interest in the photograph exhibit to be held by the Institute the early part of April in Peking.

PEKING SOCIETY OF NATURAL HISTORY

In a lecture before the Peking Society of Natural History on February 11, Professor S. W. Grabau discussed "The Meaning of the Ornamental Characters of Molluscan Shells." He carried his listeners back in thought hundreds of millions of years, telling how with the development of the world's fauna there evolved these highly specialized forms of marine life which are to be found now in the deposits in central Asia, formerly occupied by oceans. Following Professor Grabau's lecture Mr. N. Gist Gee gave an interesting exhibit of microscopic material showing sponges belonging to the *Spongilla*, *Trochospongilla*, and *Ephydatia* groups as found in fresh water ponds and canals of China.

THE NATURAL HISTORY CLUB OF THE FUKIEN CHRISTIAN UNIVERSITY, FOOCHOW

One of the most active organizations of the Fukien Christian University is the Natural History Club, composed of both students and faculty members. It was organized ten years ago, at the beginning of the University, as a Science Club, and at that time included students and teachers interested in all branches of science. Since then, as a result of the increase in the student body, other scientific clubs have been organized and the parent organization remains as a purely biological society.

The programs of meetings are for the most part carried out by the students, the faculty members appearing very seldom. Articles from current magazines are reviewed, reports are made on original studies or problems, and all members are encouraged to join in the free discussions at the end of each meeting. Immediately after the main part of each program, time is given for reports of interesting things that have been seen during the two weeks since the last meeting, and it is very stimulating to see the eagerness with which different members report on the new birds, flowers, insects, or other forms of life they have seen recently. A Bird and Flower Calendar is being kept, and it helps the students to become familiar with the life of the campus. An outdoor museum was planned for the present term as one of the activities of the club, but because of interruptions it could not be carried out. Country rambles and outdoor meetings are held whenever possible.

GEOLOGICAL SOCIETY OF CHINA

The fifth annual meeting of the Geological Society of China was held in Peking, February 12 to 14, Dr. W. H. Wong presiding. A business meeting was first held, following which came the reading of important scientific papers. Altogether some twenty-three papers were read by various authorities, showing that a vast amount of research work has been done in the past year. It is impossible to give details of these, but it may be mentioned that they will undoubtedly be published in the various organs of the Geological Society of China and the Geological Survey.

EDUCATIONAL NOTES AND INTELLIGENCE

MOTHER OF UNIVERSITIES

CHINESE STUDENTS AT LONDON CENTENARY CELEBRATIONS

China, with a contingent of eight is well represented amongst the forty other countries sending students to University College, London, now about to celebrate its centenary.

University College was the first institution of its kind in the world to offer education without distinction of class, race, creed or sex, principles which have been followed by all the newer University institutions of Great Britain and the British Empire. It was founded in 1827 by Henry Brougham, Thomas Campbell, the poet, and Jeremy Bentham, the utilitarian philosopher. With them were Henry Crabb Robinson ; George Birkbeck, the founder of mechanics institutes ; George Grote, the banker and historian of Greece ; Joseph Hume ; Zachary Macaulay, father of the historian ; James Mill, father of John Stuart Mill who was one of the first students to be enrolled, and Isaac Lyon Goldsmid, the first Jew to receive a title from the British Crown.

Amongst other countries largely represented at University College, London, are Russia, with 19 students, Holland (21), Australia (24), France (32), Africa (37), Switzerland (39), Japan (41), Germany (51) United States (52), and India (111).

ROCKEFELLER FOUNDATION TO ENDOW INSTITUTE FOR MEDICAL RESEARCH IN JAPAN

The directors of the Rockefeller Foundation have about completed arrangements for an endowment of $5,000,000 to be used for medical research in Japan under the supervision of Keio University. This money is given with the understanding that the work done will be along lines that will supplement research work elsewhere, and will conform to the requirements of the Rockefeller Institute Board. It is the prime object of the Rockefeller Institute to work out methods of preventing disease rather than to cure existing ills, so that while hospital and clinical work form a part of their program it is the lesser part.

PUBLICATIONS RECEIVED

BOOKS:

The Psychology of the Thinker : by Ida B. Saxby, University of London Press, Ltd., London, 1926.

A Regional Geography of The World : by Leonard Brooks, University of London Press, Ltd., 1925.

North-China Desk Hong List, 1927: North-China Daily News & Herald Ltd., Shanghai.

The China Who's Who, 1927 (Foreign) : by Carroll Lunt, Union Printing & Service Agency, Shanghai.

PERIODICALS :

Extrême Asie—Discovery—The Philippine Journal of Science—The Chinese Economic Bulletin—The New Zealand Journal of Science and Technology—Natural History—The China Weekly Review—Asia—The Asiatic Motor—The Bulletin of the Geological Society of China—The China Medical Journal—The American Journal of Science—Psyche—The New Orient—The Annals and Magazine of Natural History—Man—The Modern Review—Health—Chinese Students Monthly—Mid-Pacific Magazine—Far Eastern Review—The Chineso Recorder—The Bulletin of the Geological Survey of China—Bolletino del Laboratorio di Zoologia General Agrarie, Portici—Salmon and Trout Magazine—Game and Gun—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass.—The Geographical Review—The Chinese Social and Political Science Review—La Revue Economique d'Extrême-Orient—Science—Shipping and Engineering—The Modern World.

LACTOGEN

THE
NATURAL MILK
FOOD