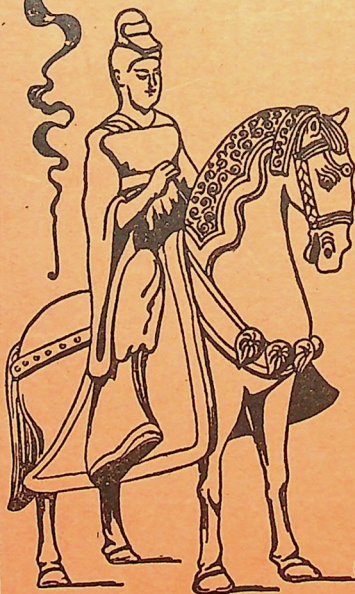




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EDITED BY
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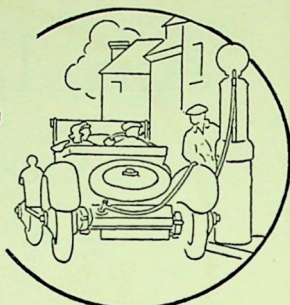


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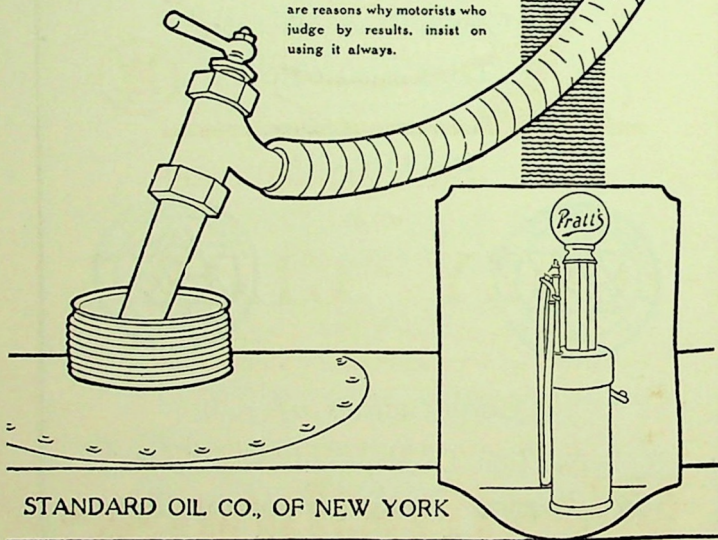
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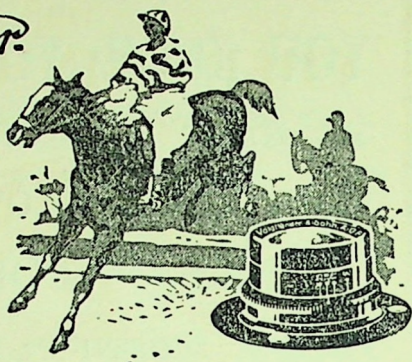
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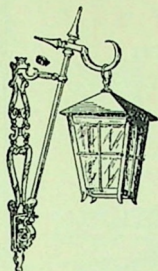
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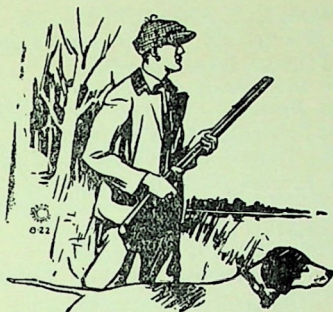
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THE CHINA JOURNAL

OF

SCIENCE & ARTS

[REGISTERED AT THE CHINESE POST OFFICE AS A NEWSPAPER]

VOL. II

NOVEMBER, 1924

No. 6

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THE SCIENCE AND ART OF WAR IN CHINA

BY

ARTHUR DE C. SOWERBY.

In his recent book "The Dance of Life" Havelock Ellis states that science and art are one, or at least so closely connected as to be inseparable.* He argues that science is not merely a *knowing* process, but also a *making* process, and since art is also essentially a *making* process, science becomes one with art. If we accept this point of view it becomes a question whether we can legitimately apply either word to war. It is not so very long ago, however, that our military writers always spoke of "the art of war"; while to-day their counterparts substitute the word "science" for "art" and speak of "the science of war." And when we come to consider the point to which things were carried in the recent World War, especially in the European areas, where every refinement of mechanics was turned to account in order to harry, cripple and finally destroy the enemy, where every branch of human knowledge and accomplishment was brought to bear upon the destruction of the "other side," we must admit that modern warfare is both a science and an art, albeit its very essence is destruction.

In China, however, things are different, on the surface at least, and the casual observer is inclined to scoff at warfare as interpreted by her people. The cynically minded might even go so far as to say that war in China is neither science nor art, though it may furnish material for good literature. From the viewpoint of our western tacticians and military experts the warfare staged by Chinese generals and armies is little other than burlesque. Generals that keep well off the field of

*Op. cit. p. 71.

battle, and even direct proceedings from the safe shelter of some European settlement or concession (where, thanks to foreign treaties, extraterritorial rights hold sway and they cannot be taken by their victorious compatriots); colonels who are shot because their men looted, when there was as much chance of stopping them as of stemming their panic-stricken flight from the field; soldiers with umbrellas and straw sandals, squatting by the roadside sipping the eternal tea; ammunition loosed off from the hip as fast as the rifles can be loaded, with the marksman (sic) well under cover and making no attempt at aiming at a target, blissfully careless, even, whether there be a target or not; bombing from an altitude of 8,000 feet; and a complete cessation of hostilities when rain falls—all combine to give the impression that a screaming farce is being enacted, rather than that a whole nation's fate is in the balance.

Could that same observer, however, get one peep behind the scenes he would realize that, beside the science and art of Chinese war, those of ours pale into insignificance. It is not to the might of armed hosts that your Chinese general trusts to win his war. Your Chinese general is first and foremost a diplomat, an intriguer, a manipulator of human passions on a grand scale, and it is behind the scenes, well away from the field of active strife, that the most important battles are lost and won. Not at the hips of the ill-served guns, or at the point of the rusty bayonet, is the nation's destiny decided, but in the secret chambers of the Field Marshal's safe retreat, where stealthy figures come and go, enormous sums are discussed and treacherous plans and promises made.

The present conflict in China is no exception. Take a glance at the history of hostilities up to date. Look at the actual battle front in Kiangsu, where not twenty miles from the fighting line a successful race meeting was held some days after the opening of hostilities. Note the loose front line—indeed there was no real line at all, but mere handfuls of men scattered over a wide front with here and there a massing of troops at points which were thought to be strategic,—no trenches, each unit making what use it might of the natural unevenness of the ground which it was supposed to defend. Compare the casualties after a few weeks of warfare with those that occurred when the British and Germans met at Mons. Tens instead of thousands was the order here. See the so-called Chekiang forces putting up a bold front in a position so hazardous from a military point of view that any European general would have evacuated it before hostilities commenced, and see those same forces cut off from their logical base and their commander driven from his headquarters in Hangchow by a complete repudiation of him and all his works on the part of the very province of which he was overlord. A nervous colonel, who cannot quite make out which cause to espouse, that of the rebels or that of the Central Government, blows up a couple of bridges on the Shanghai-Hangchow railway line in the Chekiang general's rear, thus dividing the latter's forces and effectually closing his only possible line of retreat in the event of defeat. Observe how that in spite of the fact that the Kiangsu forces outnumbered those of Chekiang (who, by the way, are mainly Shantung mercenaries, under the command of a Northerner,

Lu being also a Shantung man, and not a native of Chekiang), and that the latter were in a hopeless position, they utterly failed to overwhelm their opponents in the first few days of the offensive and bring these foolish hostilities to a timely end! And, finally, mark the Chekiang Marshal's ignominious and contemptible flight from Shanghai to Japan, while his troops were still in possession of the field putting up what, for Chinese, was a remarkably good fight, leaving those same troops unpaid, leaderless, without any line of retreat, at the mercy of the advancing enemy, free to loot and pillage! And the reason? One of his own subordinate generals had turned on him in the council chamber and advised him to go, since he, the subordinate, and his men would fight no more.

Even the fighting in the North, which is on a far greater scale than was that in Kiangsu, is laughable when compared with what similar operations would be in most other parts of the world. Chang Tso-lin has shown a bold front with his supposedly well-equipped and well-trained army, his aeroplanes and his trench mortars (Stokes guns), his foreign advisors, mechanics and trainers. He pushes into Chihli territory in a sort of encircling movement threatening Peking from the northeast by way of Jehol. According to accounts three of his battalions engage and rout a whole division of the Chihli troops. Two years ago, when his army was well into Chihli territory and he seemed to have everything in his favour for complete victory, he engaged in an ignominious retreat to Shanhaikuan to the surprise of all parties. Will he do any better this time? Wu Pei-fu has already stemmed the tide of the advancing Manchurian army. At the time of writing things seem to be hanging in the balance. There are rumours of the imminent disaffection of this or that prominent supporter of one or other side. The "grand offensive" is delayed unaccountably. There seems to be no attempt at a rapid well-timed advance, such as has been a marked feature of most of the recent wars in the West.

Can this be called warfare as we of the West know it?

Certainly not. But behind the scenes, where the war correspondent and newspaper man has no place, a struggle goes on that might well rouse the envy of the men who engineered the World War. There the master minds talk in millions of dollars, whole provinces are the pawns, and checkmate may mean the head of the player.

Your Chinese general does not really like to resort to force. Casual though he may be in regard to human life, he nevertheless is not anxious that his men should be killed. He carries his offensive into the enemy's camp by means of his emissaries, who with promises of wealth or high official positions—which are synonymous in China—seek to alienate the former's supporters. His soldiers are mainly for defensive purposes, and he keeps them because he knows that their mere presence will help to keep away those of his enemy, who is equally unwilling to put matters to a final irrevocable test of force; they are cards in his big game of bluff.

And what wisdom is theirs. How much sounder in the long run to win battles and causes this way than by the disastrous methods

adopted by us Westerners, who will throw huge armies into the field, slaughter each other, exhaust our own and each other's resources, and, when we have laid waste half a continent, sit round a table and compile peace treaties that settle nothing. Your Chinese war lord prefers to make his peace treaties first; to spend his money not so much on munitions as on buying over his enemies. He seldom pays his own soldiers. At times he even supplies them with dummy ammunition!

It is for this reason that it is so difficult to foretell the probable course of events in China: for this reason that our newspaper correspondents are so invariably wrong in their prognostications. They know not what hidden forces are at work; they know not what sums are changing hands; they know not who is being bought and who sold.

It is for this reason that we never see a really decisive military action in China. Threats, loud mouthed claimings of victories, marchings, counter-marchings, shufflings for positions, attacks that break down for no apparent cause, retreating and supposedly defeated armies allowed to escape—these follow each other in bewildering rapidity, and remain a perpetual puzzle to our serious minded military experts; but the real war is going on where none may see. Out of its welter of intrigue great figures arise, they become the lords of provinces, who fleece the people for a number of years, and then retire to comfort and obscurity in the shelter of some foreign concession, while others, their erstwhile underlings for the most part, carry on the game.

The immense armies remain intact, or are reshuffled, warfare is always threatened, sporadic fighting takes place; but the master minds continue to play the same old game in the same old way. Of course the people pay; but, taking it all round, they do not pay anything like the price that we Westerners do for our little wars. Here and there cities are looted by uncontrolled soldiery; while the generals make a practice of levying war funds upon the citizens of the towns in their respective territories, which at times falls heavily upon those unfortunate enough to live in disputed ground; but there is no such thing as a permanent income tax raised to proportions that are crippling to every member of the community; there are no such things as the devastated areas of France and Belgium in the recent World War. In the main the country shows but little the effect of its internal strife; the people pursue their ordinary avocations comparatively undisturbed, those away from the actual scenes of hostilities generally unaware of their occurrence, and, in the end, things settle down in the same old way. The game of chess is over for the moment; and the pieces are put away in their box for a season.

THE GODDESS OF THE MOON

BY

LING JUI TANG

Persons of the Play :—

Chang Ngê, the Goddess of the Moon.

Han I, her husband.

Woo Kan, the man who digs the cassia in the moon.

A White-rabbit.

SCENE I.

The scene is in a lonely mountain during the time of the Han Dynasty. Chang Ngê, dressed in yellow, sits thoughtfully in the lonely mountain cave.

CHANG NGE.

For a whole year no one has come to the mountain,
One hears only the singing of birds in the pine grove.
The leaves these days have turned red and yellow,
Autumn has come again to the world.

(Rising she sings).

Let me sing and dance while I am young.
Who knows how many days are still in store for me ?
Life is like the vanishing morning dew,
And time is passing, oh ! so swiftly.

*(Walking out of her cave, she hears the sound of
some one grinding).*

The grinding sound comes from my husband's cave.
What is he doing now ?
Since I accompanied him to this lonely place,
I have missed the joy of all human society.
How can a young woman forget her dear parents and lovely
sisters.
When one has only a silent husband
Who never spends his time in merry making ?
For years he has sat alone and read only Taoist books.
It seems unnecessary to him to talk to any one.
I shall go now and find out what he is doing.
I shall ask him to go with me to yonder mountain,
To see the fragrant golden cassias.

SCENE II.

Scene :—A Cave, Han I, sitting silently with closed eyes, holds an old book in his hand. A white-rabbit stands on his hind legs and pounds something. Chang Ngê enters.

CHANG NGE.

My good husband, what pleasure is there in sitting alone day
and night ?

Do you ever open your eyes to look out upon the wide world ?

Oh ! it is so beautiful to-day.

Birds sing, the autumn flowers bloom

And the white storks are flying together.

HANG I.

Please leave me a while my beautiful wife.

I am thinking of a perplexing question.

My heart is never moved by anything pleasing to the sight.

It is as dry as an ancient well and hard as a rock.

Go to your cave ; let us enjoy ourselves in our different ways.

*(Chang Ngê filled with disappointment, looks out
from the cave).*

CHANG NGE.

Nothing in the material world can move

Your Taoist heart, I know it well.

Let us enjoy ourselves before we leave this life.

(She sees the rabbit pounding something).

What is the rabbit pounding ? It is such a beautiful animal.

Where did you get it ?

I love its snow white fur and cherry-red eyes.

HANG I.

I received it from the Western Mother because of my hard work.

It pounds some herbs which can change human beings.

My good wife, go back to your cave.

I cannot go with you to-day.

(Chang Ngê walks out from the cave).

CHANG NGE.

I cannot sit alone as he does this beautiful day,

I do not want to make myself immortal.

The Taoist's task is too hard to be endured.

Ah ! Autumn winds, will you carry me to yonder mountain,

The beautiful cassia blooms joyously there.

SCENE III.

Scene :—*Another part of the mountain. The rabbit, which has been busily
pounding the magic powder, enters.*

THE RABBIT.

Once I lived in the Garden of the Western Mother

Where the flowers always bloom, the fruits ripen,

And the soft grass is ever green.

I have heard the songs of the beautiful fairies

And I have seen their dancing.

THE GODDESS OF THE MOON

The Western Mother has held me upon her divine breast.
The Goddesses have played many times with me.
But now all these are gone !

(Chang Ngê enters).

CHANG NGE.

Rabbit, of what did you speak ?
I heard your long sigh.

THE RABBIT.

(With a timid look).

I was thinking only of my beautiful past.
My mistress, would you see my master ?
He is busy finishing his work to-night
And commanded that no one should enter his cave.

CHANG NGE.

Oh no ! I do not care to see him.
Tell me what powder you are making, I would know.

THE RABBIT.

This magic powder can change a human body.

CHANG NGE.

Who will take it ?

THE RABBIT.

(With a troubled look).

I dare not say.

CHANG NGE.

Never mind, my lovely rabbit.
I shall keep it as a secret.
I have plucked many delicious beans and grasses for you.
I shall ask my husband always to allow you to accompany me,
Then we shall be good friends in this lonely place.

THE RABBIT.

I shall tell you the truth since you have shown your love for me.
It will be taken by my master, your husband.
If he takes it, he will go to heaven.

CHANG NGE.

Really ?

THE RABBIT.

Surely, the Western Mother told me so.

*(Tears fall from Chang Ngê's eyes. She stands
mute for a while).*

CHANG NGE.

Rabbit, will you go to my cave and bring me a basket ?
I shall go to yonder mountain to see my beautiful birds there.
The Autumn night is so long and quiet,
I cannot sleep while the moon still rises above the forest.

THE RABBIT.

I will, my mistress.

(The Rabbit withdraws).

(Chang Ngê looks at the jar).

CHANG NGE.

If he eats this he will go to heaven forever,
And I shall suffer still greater loneliness.
Why did he not tell me about this ?
He has become tired of me.
For years I have suffered with him,
And because of my suffering I had hoped
He would take me with him.
Let me take this first.

(She takes up the jar and eats the powder. After finishing it she suddenly feels her body becoming light. She cannot remain standing and begins to fly).

Am I in a dream ?

Why is my body carried up by the winds ?

Have I wings ?

No, these are my arms.

Oh ! I fly higher than the mountain.

It is colder here than on the earth

The moon is so large !

How beautiful the river is !

Its surface is silvery white under the moon light.

The purple and blue mountains lie asleep.

The water-falls are busily singing their lullabies.

(She flies eastward).

That must be a great city ;

Yet all the houses and trees are so small,

They seem to be the toys of heaven.

We on the earth are but drops of water in the great ocean.

I cannot open my eyes, a few twinkling stars hurt my sight.

But I hear beautiful music which comes down from heaven.

I smell the fragrance of cassia blossoms.

Ah, west-winds, how far will you carry me ?

SCENE III

Scene :—*The Moon Palace. Woo Kan is digging the cassia trees. Chang Ngê enters.*

CHANG NGE.

Is this the moon palace ?

The silvery light is brighter than the sun-shine.

I see high transparent buildings

And ground as if made of white jade so smooth and clean !

I must take care when I am walking.

The air is full of the fragrance of the tall cassia trees

Which nearly touch the dazzling white sky.

(She sees Woo Kan digging the cassia trees.)

THE GODDESS OF THE MOON

Is he a human being ?
Why does he dig the tree ?
Is it not a pity for a man to work in such a beautiful and lonely
place !
I must find out why he digs this lovely tree.

(She walks near Woo Kan).

May I ask you what place this is and why you dig the tree ?

WOO KAN.

Who are you, madame ?
This is the Moon Palace ;
Your dress is like that of human beings.
Who led you here ?

CHANG NGE.

The winds have carried me here.
Yes, I come from the world of mortals.
These cassia trees are so beautiful and fragrant,
Why do you dig them ?

WOO KAN.

Our gods ordered me to dig them,
Because they grow too fast and touch the sky.
A hundred years ago, I was a god, but
Because I stole fruit in the God's Garden I was exiled here.
The gods felt these cassia trees were growing too high so made
me dig them.
I took up this work many years ago and I have dug day and
night ;
But never do I finish digging.

*(The rabbit comes up in a great hurry. When he sees
Chang Ngê, he kneels down before her).*

THE RABBIT.

Great honour to my mistress !
Oh, no ! to my Goddess of the Moon.

CHANG NGE.

(With surprise).

Why do you come here ?
And why do you address me as the Goddess of the Moon ?
Rise and tell me quickly.

THE RABBIT.

(Rising).

My kind mistress, no, my honourable Goddess,
Let me tell you the reason why I address you as my Goddess.
When I brought your basket back and saw the jar empty,
I dared not tell my master.
I walked up and down the mountain, in order to find you

And to ask you for the magic powder.
I thought that you mocked me by hiding
And walked till mid-night, but could not find you.
I shed tears and prayed to the Western Mother
And begged her divine sympathy.
She appeared on the clouds and thus spoke to me :
" Rabbit, do not worry about the powder
For I saw your mistress eating it.
I have made her the Goddess of the Moon ;
And the winds have carried her to the Moon Palace.
You may go there, too, if you wish.
I am pleased to see that you are faithful to your master.
Go and tell your mistress."
My mistress, now you are the Goddess of the Moon.

(Sounds of music).

Listen, my Goddess, the goddesses are coming with beautiful
music and welcome-songs.
They will lead you to the Western Mother.
There you will be honoured and become a goddess.

CHANG NGE.

Always be good, my lovely Rabbit.
Remember the kindness of our Western Mother.
From now on, I leave the world behind me.
I shall shine upon everything on the earth.
I shall give sweet dew to all living things and make them grow.
I shall make my light different from that of the twinkling stars
or the hot sun.
Human beings may look at me in the night and their eyes be
uninjured.
I shall sympathize with those who are in sorrow and distress ;
In the cold and silent night with tears they will pray to me.
Come, Rabbit, let us go and welcome the goddesses.

CHIN KU CH'I KUAN
今 古 奇 觀
THE PERSECUTION OF SHEN LIEN

STORY NO. XIII.

TRANSLATED BY

E. B. HOWELL.

(Continued from page 423)

After they had started on their journey Wen Shih never left Shen Hsiang's side, and his tea, his broth, his rice, and indeed all of which he ate or drank, were made ready by her. At first Chang Ch'ien and Li Wan spoke politely to the couple, but after they had crossed the Yang-tzu river and had taken to the road again at Hsü Chou where they were far from home, the two men began to behave rudely to them to shout at them as loudly as a gambler shouts at his dicing, and so by degrees to ill-treat the unlucky pair.*

"I think that these men are plotting some mischief against us" said Wen Shih to Hsia Hsiang when they were alone one day. "I, your servant, am but a woman and know but little of the road, but if before us lies some wild and deserted district we should take good heed of them!" And Shen Hsiang nodded, half in doubt and half believing that his concubine's fears were well founded.

A few days later the two men were observed constantly whispering together in consultation, and one of them, moreover, was seen to produce from his bag a short sword which glistened like the hoar frost. Then Shen Hsiang began to become very frightened indeed.

"As you have said" he remarked to Wen Shih, "these men are evidently plotting some evil and I think that I can guess nearly all their plans. To-morrow we shall arrive at Chi-ning Fu, and when we have passed that city we should cross the Ta Hang mountains. There the district called Liang Shan P'o is a very wild one inhabited mainly by brigands and highwaymen. When we arrive there they will probably try some dastardly trick upon us. You cannot save me nor can I save you! What shall we do?"

"But have you any plan whereby you might save yourself?" asked Wen Shih. "I beg you to regard your own safety solely and to leave me altogether out of your count. As for me I am not afraid that these two men will swallow me alive!"

* *Dicing.* Six dice are commonly used in China and are thrown into a rice-bowl, the object being to score the highest number of points or a sequence. Those who throw after the first thrower shout loudly at the dice to induce them to turn up showing the number required.

"Well," said Shen Hsiang, "just inside the east gate of Chi-ning Fu there lives a minor official named Feng, who is at present in mourning. This man is one who is always ready to help those in trouble and was a contemporary of my father, with whom he was on excellent terms. I will go to-morrow and see him and he will certainly help me if he can. But I fear for you. You are but a woman and therefore of but little resolution; I am afraid that you would be unable to rid yourself of these two men who might easily cause you suffering and inconvenience. How, therefore, should I feel easy in my mind about you if I were to escape? Had you the power to keep these men from acting improperly towards you I could make my escape without misgiving, but as you have not I will live or die with you, submitting to the decree of Heaven with resignation?"

"If you, Sir, really have a method of escape" answered Wen Shih, "I beg of you to make use of it. I shall be sure to find my own way of hoodwinking these men. So do not, I pray you, be solicitous on my behalf!"

Thus the two took counsel together, for Chang Ch'ien and Li Wan being tired after their long day's march, had that evening each drunk a skinful of wine and were sleeping very soundly and snoring loudly, so they overheard nothing of their captives' conversation.

Next day they were all up at dawn and as they proceeded on their way Shen Hsiang addressed Chang Ch'ien.

"How far is it now to Chi Ning?" he asked.

"About forty *li*" was the reply. "We should arrive there about noon."

"At Chi Ning, just inside the east gate" remarked Shen Hsiang, "there lives a minor official called Feng. He was formerly a great friend of my father's and once when he was living in Peking he borrowed two hundred taels of silver from us; I have the receipt here with me. Now this man Feng has just held an appointment in the Customs, so he is at present probably very well off, and if I go and ask him for this money he will understand that I have got into difficulties and he will be sure to pay me. We shall then have plenty of funds for the rest of the journey and we shall be more comfortable by the way."

On hearing this proposal Chang Ch'ien began to raise objections, but Li Wan agreed at once and he took his colleague a few paces apart.

"I think that he can be trusted" he whispered. "Moreover that girl of his and his baggage are all in our hands. I do not think that he has any ulterior motive. We had better let him go and get that money, for it will be a stroke of luck for you and me. Why, indeed, should we not?"

"Well," said Chang "if we put his luggage in the inn and I keep the girl there too, and if you go with him and never let him out of your sight, I admit that there will be very little chance of any difficulty arising."

XII.

To make a long story short, they arrived at about eleven o'clock that morning outside the gate of Chi Ning where they selected a clean inn.

"Now which of you two gentlemen is coming into the city with me?" asked Shen Hsiang when the luggage had been deposited inside the inn. "We can easily get back in time for the midday meal."

"I will go with you" said Li Wan. "It may even be that your friend will ask us to stay and dine with him!"

"A man's behaviour always depends on the position of those with whom he deals!" remarked Wen Shih to her husband, by way of deceiving their escort, "and he is apt to blow hot upon the prosperous and cold upon the unfortunate: thus says the proverb. Mr. Feng may have owed your father this money, but your father is dead now and when your friend sees that you are in difficulties I do not for a moment believe that he will pay you back. You will probably have your visit for nothing and be insulted into the bargain! I think that you had much better have your dinner here and get on with the journey!"

"But it is such a short way to the east gate" returned Shen Hsiang. "I think that I had better try, come what may; and in any case I shall be risking nothing by going."

And Li Wan, who had set his heart on that 200 taels of silver of which he had heard, exhorted Shen to go. So the latter said to Wen Shih "Just sit here and wait. If I am back soon it will probably mean that I am unsuccessful; but if he is generously disposed and keeps us to dinner he is likely also to pay me at least part of the debt, and then to-morrow I shall be able to hire a cart for you to ride in for the rest of the way. You must be thoroughly tired of riding on mule-back by now."

"But I do not want to be kept waiting here all day" returned the girl with a meaning glance at her husband, "so try to get back as soon as possible."

"Oh, we won't keep you waiting very long" said Li Wan with a laugh. "There is no occasion for such a to-do!"

So off they started; but as they did so Wen Shih called Li Wan back in order to give her husband a chance of getting away by himself. "If you are detained at Mr. Feng's, and stay on to dinner" she said to the man earnestly, "I beg of you to bring my husband back to me as soon as you can!"

Li Wan replied that there was no need for such an exhortation and turned to go; but in the short time in which he had stopped to listen Shen Hsiang had already walked a short distance by himself. Li Wan thought that this was of no moment, for Chi Ning was a place which he knew very well having been there many times before; moreover he knew where Mr. Feng's house was, so he had no doubt as to his direction. So he hurried along after his prisoner; but as he walked he was suddenly seized with an internal pain and had to proceed slowly, so by the time he arrived at the east gate Shen Hsiang had obtained a good start.

When the latter looked round after he had gone a little way and found that Li Wan was not in sight, he took to his heels and ran as hard as he could to Mr. Feng's house. By the greatest good fortune he found Mr. Feng alone in his library when he entered. The two had known each other well in the capital and Feng started with pleasure when he

saw his friend so unexpectedly. But Shen did not waste time in ceremonious greetings.

"Please take me to some private place where I may speak to you alone" he gasped out, laying his hand on his friend's sleeve. And the latter seeing that there was something the matter led him to a small room at the east end of the building. Here Shen burst into tears.

"What is it, my cousin?" asked Mr. Feng. "Tell me quickly and waste no time in lamentation!"

"My father has been done to death by that villain Yen" said Shen Hsiang through his tears; "and as if that were not enough, my two brothers have also been killed because they were living with him. They were beaten to death by Yang Shun and Lu K'ai. I was at home in Shao Hsing at the time, and a despatch was sent telling the Prefect there to have me arrested and sent up north for trial also. Thus will our family be cut off and no one will be left to sacrifice at the family tomb, for the two men who are escorting me have plotted against me and, acting on orders probably received from Yang and Lu, they will kill me I fear in the mountainous region that lies in front of us. But I determined to devise some means of escape, so I have come to see you. If you can think of any plan whereby I may be protected, I beseech you to act at once, and the gratitude of my father in heaven will be as great as the ocean. If, however, you can do nothing for me, I will batter my head upon yonder wall till I die, for it would be better to die thus before your eyes than at the hands of those vile traitors."

"My worthy cousin" replied Mr. Feng at once, "rest assured of my help! At the back of my bedroom is a secret chamber where you may hide—a place where you will never be found no matter how diligently they may seek for you. I will keep you there for a while until some plan may be devised for you."

"Oh excellent cousin!" replied Shen Hsiang, falling on his knees and kowtowing his thanks, "you are my second father and mother!"

Mr. Feng raised the other up at once and led him upstairs into his bedroom. There he pushed aside one of the wooden panels in the wall and revealed a hole and the top of a stone stairway. Down they went together, the host closing the panel as he went. They descended some 50 or 60 steps till they came again into the light and there Shen Hsiang found three tiny isolated rooms surrounded on all sides by blank walls. It was in fact a kind of secret dwelling to which there was no access except by the way by which they had come.

There Shen Hsiang dwelt, and every day his friend brought him tea and rice. The rules of the house were very strict and no one of the establishment would have dared to breathe a word of what went on within.

The leopard in the mountain caves may find a refuge sure,
Among the poplars in the woods the crows may roost secure;
Fear not your savage escort, for a helper staunch is nigh,
Such a man as helped the friendless in the famous days gone by.

XIII

Now we must see how Li Wan fared. He reached at last the neighbourhood of the east gate and found Mr. Feng's house.

"Is your master at home?" he asked the gatekeeper; and when he was told that Mr. Feng was within, he went on: "then may I ask if a young gentleman clad in white robes has just now come to visit him? And if so, did he see him?"

"Yes, Sir," answered the man, "and Mr. Feng asked him to stay to dinner; they are now in the library together."

When Li Wan heard this he felt much easier in his mind and sat down to wait. He waited until about four o'clock in the afternoon, and then, sure enough, a young man clad in white did come out of the guest chamber. But when Li Wan rose eagerly to meet him, behold it was not Shen Hsiang at all but someone he had never seen before who went straight out of the gate and left the premises.

Li Wan could then brook no further delay, more especially as he was ravenously hungry, so he went again to the gate-house.

"You told me that your master detained that young gentleman to dinner" he said to the gatekeeper. "How is it that he is sitting there so long?"

"He went out just now!" replied the man. "Did you not see him pass?"

"Surely there is another guest in your master's library?"

"I do not know!"

"Who was that, then, who came out just a moment ago, dressed in white?"

"That" replied the gatekeeper "was my master's brother-in-law. He comes in here very often."

"And where is your master now?" asked Li Wan.

"My master takes a siesta every day after his dinner" was the reply. "He is probably sleeping now."

By this time Li Wan was beginning to think that he was on a false track altogether and he became somewhat annoyed.

"I will not deceive you, Sir" he said. "I am an emissary from His Excellency the Viceroy of Hsüan Hua, and I am in charge of a man from Shao-Hsing called Mr. Shen Hsiang, who was recently arrested there in compliance with the orders of the Emperor. I am acting as his escort, and when we arrived at your honourable city he told me that he was on the best of terms with your master who was a cousin of his. He said that he wanted to come here and call upon your master, so I came with him hither. I have now waited for him a very long time and he has not yet come out, so he must still be upstairs in the library. You see of course, my uncle, that this must be so. I beg that you will go and give him a call and tell him to come out at once, for we must be on our way."

"What nonsense are you talking!" retorted the gatekeeper pretending not to understand. "I cannot quite gather your meaning!"

Li Wan suppressed his rising anger and repeated all over again what he had just said.

"You must have seen a ghost," replied the gatekeeper expectorating in assumed disgust. "There has been no Mr. Shen here. My master is in mourning just now, and receives no guest at all except his own immediate relatives. It is my constant duty to tend this gate, and those who enter and leave are all announced by me. To judge by the nonsense that you have been talking, I should say that you are one of those tricksters who make their living by pretending to come on official business and then stealing things out of the houses into which they gain admittance! I must request you to leave quickly, for I cannot permit you to disturb the peace in this place!"

"This Shen Hsiang is a malefactor of importance, I tell you," shouted Li Wan who was now becoming thoroughly angry, "and his arrest was most particularly commanded by the Emperor. This is no joke, I can assure you, and I insist that you ask your master to come out, for I must have a word with him!"

"But he is asleep, I tell you!" replied the gatekeeper. "I cannot go in and wake him up on such a pretext as this! You are evidently a savage from one of the hill tribes who has not learned decorum!" And so saying, the gatekeeper turned his back on Li Wan and went again into the gate-house.

"This gatekeeper is himself evidently a rustic with no experience," thought Li Wan. "Why, I wonder, will he not take in a simple message for me? That Shen Hsiang must be inside there. I hold the Viceroy's warrant and it is no affair of my own. Why should I not make my way in by force?"

And with these reflections he worked himself up into a state of desperation and burst open the doors that led into the inner courtyard where the reception rooms were, and banged loudly upon the wooden screen in front of the door of the centre room.

"Mr. Shen, Mr. Shen!" he cried. "We must be off!!" But he got no reply, so he called out again and again until at last he heard someone coming.

"Where is that gatekeeper!" said a lad's voice. "And how does he come to admit people like this, to make such a disturbance?"

Li Wan was just about to go round the corner to meet and interrogate the speaker, when the latter who was a young slave-boy looked round the screen at him and then went off down the passage at the side of the guest room.

"He must be going to the library" thought Li Wan. "I had better go along after him and see for myself. Why indeed should I not?"

So he made off in the direction in which the lad had gone, and soon found himself in a covered passage where there was no one to be seen. He went straight on and found numerous rooms all round him in which he heard women moving about, so he became alarmed and dared to go no further. So he began to retrace his steps, and as he did so he heard a great hubbub outside. He went therefore right back to the front

gate where he found his colleague Chang Ch'ien who had come to look for him and was having an altercation with the gatekeeper.

"You are a fine fellow indeed" cried Chang Ch'ien to Li Wan as soon as he set eyes on him. "You have been guzzling in this place all day long and neglecting your business, have you? You came here at ten o'clock and it is now after four, and you are still idling about instead of bringing that criminal back out of the city! What are you still waiting for?"

"Pah!" ejaculated Li Wan. "Much guzzling have I done! And as for that fellow, I haven't seen even his shadow since I left you!"

"But did you not come into the city with him?" asked his friend in surprise.

"Well, it so happened that immediately after I had started, I felt very ill and had to walk quite slowly for a space" replied Li Wan, "and when I felt better and could go on ahead, that wretch of a Southerner had passed out of my sight. I could not catch him up, but I came straight here and was told at the gate that a man dressed in white had come in, had been asked to stay to dine and was in the library. Of course I thought that it was he, but he did not come out and the gatekeeper here refused to send in a message for me. So up till now I have not had even a mouthful of cold water to drink! Please, my brother, do you wait here in my place and give me a chance of going out and attending to the lining of my stomach, and then I will come back at once."

"You are verily a useless dolt!" returned Chang Ch'ien. "Who ever heard of a criminal under arrest being left to wander about by himself! If he went into that library you ought to have gone in with him, but you do not seem to know even whether he actually went in there or not! How could you have been such a careless numskull? This is your affair and I will have nothing to do with it!" And so saying he began to make off, but Li Wan ran after him and stopped him.

"Of course the fellow is in there!" he declared. "There is no where else that he could have gone to. Please stay and help me to question the people of the house and get him out. That is but right, for you have had your dinner. What are you in such a hurry to get back for?"

"It is that girl of his," replied Chang Ch'ien. "She is waiting in the inn; and although I did tell the innkeeper to keep an eye upon her, I do not feel easy about the matter. After all, she is the string in Shen Hsiang's nose, and if we keep hold of her, there is but little fear but that he will come back for her!"

This struck Li Wan as but reasonable, so Chang Ch'ien went back to the inn and Li Wan had to stay where he was and put up with his hunger. He waited and waited and still received no news of the missing man. Then the sun began to sink and the dusk of evening to gather. He could no longer bear the pangs of hunger, so, remembering that there was a cake shop near by that he had passed, he could not help running off and pawning his shirt to get some money to buy himself

something to eat. The shirt fetched only a few cash, but these he quickly expended in flat cakes which he devoured immediately.

As he was so occupied he heard a noise coming from Mr. Feng's gate house, and on running back to find what should be the cause he saw that the gates were being barred in for the night!

"I have been an official messenger for many years now," he said to himself, and have never before been treated with such scant courtesy! This man Feng is no big official that he should have so fierce a gatekeeper! How that Mr. Shen will laugh at us! But his girl and his baggage are all at the inn; that is good! Oh! Mr. Shen they are evidently keeping you for the night but in that case you ought to have sent out word to me! I suppose that I shall have to make the best of a bad business and sleep here on the ground. Then to-morrow I will soon find some intelligent servant coming out from whom I shall be able to get some news."

Now it was then the tenth moon, and although the weather was not yet very cold, a chilling wind sprang up about midnight and brought with it a drizzling rain. Li Wan's clothes were soon soaked through and he felt very wretched, for the rain did not cease until the dawn.

Soon after the sun had risen Chang Ch'ien came again and joined him, for Wen Shih had urged him repeatedly to go and find her husband, so back he had come, bringing with him this time his own written authority and the warrant for Shen's arrest.

The two consulted together, and when at last the front door was opened, they burst inside and going right up to the door of the reception room, they shouted and yelled, and the gatekeeper, do what he could, was unable to prevail upon them to stop. All the servants in the house, big and small, came out to see what the matter was, and as they all talked at once there was a veritable pandemonium. The people in the street heard the to-do and soon a large and curious crowd collected. Mr. Feng then became much alarmed and came out of his room. I will tell you what he looked like:—

A cap of roughest cloth upon his head,
(Though ornamented with a chaste design)
A coat of coarsest hemp he had instead
Of customary robes of satin fine.
A girdle rude of rope he bore
Straw sandals on his feet he wore.

A cough was heard within, and the servants shouted that their master was coming out and that the crowd should stand at the two sides of the courtyard. Mr. Feng then emerged from the house.

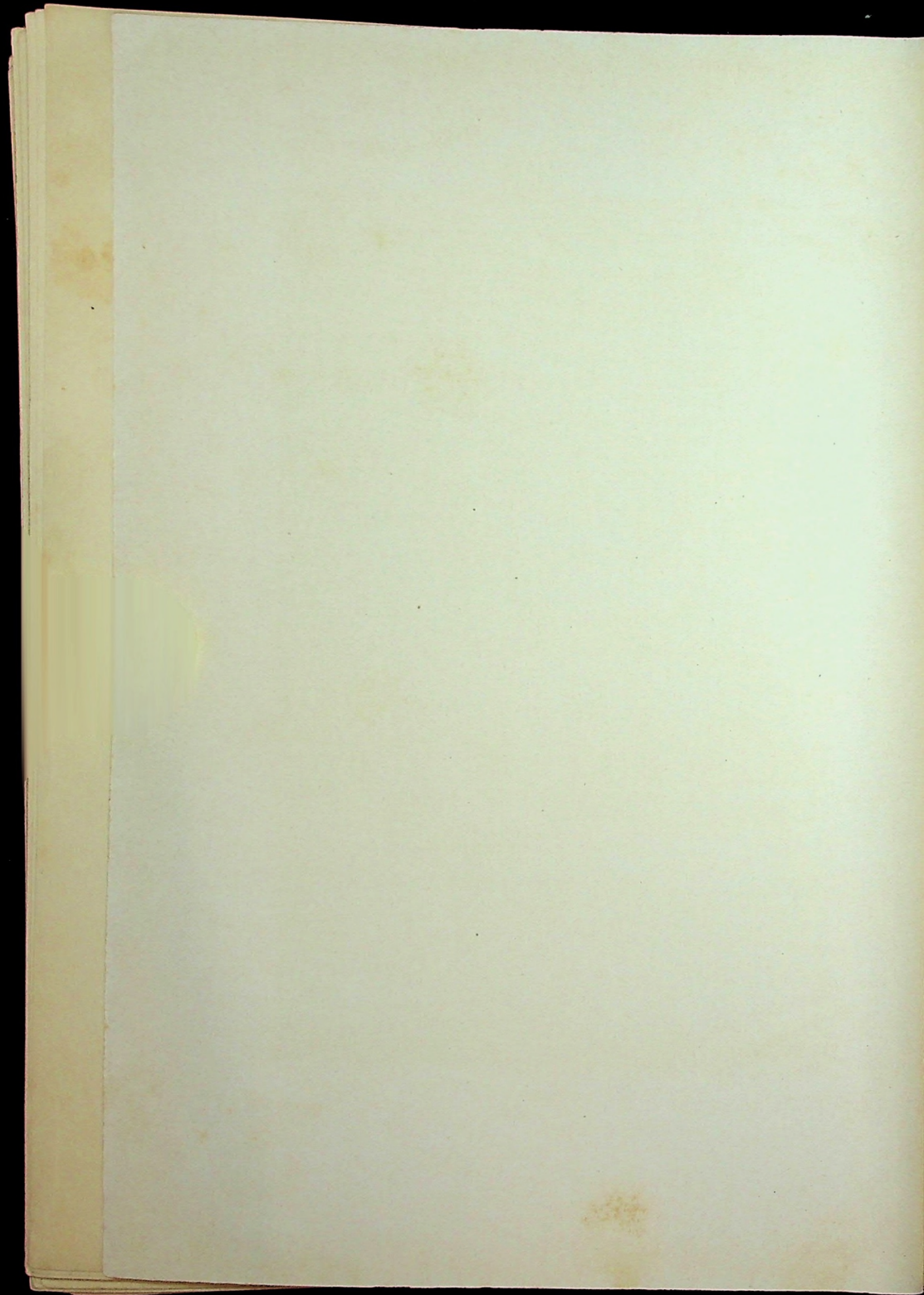
"What, may I ask, is the reason for all this disturbance?" he said.

Chang Ch'ien and Li Wan then stepped forward and saluted him.

"Sir" they said, "our duty to you! We are the bearers of a despatch from His Excellency the Governor-General of Hsüan Hua. We were sent to Shao Hsing to arrest a malefactor in the name of the Emperor. The man's name is Shen Hsiang. As we passed through this your honourable town, he said that he was a friend of yours and wished to come here and call upon you. We did not venture to oppose



"Mr. Feng then emerged."



his wishes and allowed him to come and see you. He came yesterday morning but he has not yet been seen to emerge from your premises. He is thus delaying our journey back to Hsüan Hua. Your servants also refused to take in our petition to you, so we beg of you, Sir, of your great kindness, to send this Mr. Shen out quickly so that we can resume our journey." And after this explanation, Chang Ch'ien took out of his coat his official despatch and handed it to Mr. Feng.

"Is this man Shen Hsiang the son of that sub-magistrate who was called Shen Lien?" he asked when he had read through the document.

"Yes, Sir," replied Li Wan.

And on hearing this, Mr. Feng stopped his ears with both hands and put out his tongue in horror.

"You people who have suffered banishment*" he cried, "are really a terrible lot! Had it been merely that this miserable man's arrest was ordered by the Emperor, it would not have mattered so much. But he is an enemy of Prime Minister Yen!! Who would dare for one moment, do you imagine, to receive such an individual into his house? Of course he never came in here yesterday! You are talking nonsense, and if the officials here heard of such a rumour and communicated it to the Yen family, I should get into the most terrible trouble! This difficulty is evidently due to the carelessness of you two frontiersmen. I wonder how much money you received to connive at the escape of so important a criminal!! And then you dare to come and put the blame upon me! . . . Hi! my men;" he went on, calling to his servants, "put these two soldiers outside and bar the big doors! I do not permit riots like this to occur upon my premises! If the Yens knew that such a man that had been reported to have entered my house, it would be no joke for me!"

And he went back into the house still abusing the two lictors, while his servants, having received his instructions, began pushing and pulling until in a few moments they had ejected all the crowd and had barred the big doors after them. Even then Mr. Feng could be heard cursing inside.

Outside the premises Li Wan and Chang Ch'ien stood and stared at one another in blank amazement and dismay, and their mouths opened so widely that it seemed as though they would never again shut, their tongues protruding until it appeared improbable that they would never again be withdrawn!

After contemplating one another in this manner for some time, Chang Ch'ien began to fall foul of Li Wan.

"It was you yesterday" he cried "who persuaded me to let him come into the city! Now you can just go and find him by yourself!"

"I beg of you" replied Li Wan humbly, "to spare your reproaches! Let us go together and ask the girl. Perhaps she can tell us where he has gone, and then we can begin our search anew."

* The frontier soldiers were all recruited from those who had been banished from other parts of China. The inference is that though all yamên runners are rogues, those from the frontier would be even more so than lictors in China proper.

"You are right" said Chang Ch'ien. "She is a faithful little baggage, and yesterday when Shen did not return, she cried all night long and sat up for him for six or eight hours waiting. She is sure to know where he has gone."

And talking thus they hurried out of the city gate and made their way to the inn where they entered and looked for Wen Shih.

XIV.

When the girl heard the voices of the two men, she came out of the inner premises in all haste.

"Where is my husband?" she cried. "Why has he not come back?"

"Ask him" replied Chang Ch'ien pointing to Li Wan; and the latter proceeded to relate in detail the events of the previous day: how he had been delayed upon his walk with Shen Hsiang, and of his experiences at Mr. Feng's house, thus and thus, omitting no detail.

"And this morning," he concluded, "On an empty stomach, we were wrongfully accused of all manner of ill. It seems that your husband never went to Mr. Feng's house at all, and we think that if there is any other place to which he was likely to have gone, he would certainly have mentioned it to you. If he did so, I beg of you to tell us at once, so that we can go and find him."

But before he had finished speaking Wen Shih's eyes began to fill with tears and she laid a hand on the arm of each of the two men.

"Please bring my husband back to me, I implore you!" she begged.

"And it was at your husband's own wish" said Li Wan "that he went out to call on this uncle of his; and we, of our goodness, allowed him to do so. How can we tell where he is? He has got us into great trouble over this matter and we feel most indignant about it. *We* do not know where to look for him! And now you are begging us to find him for you just as though *we* had hidden him! A fine joke indeed!" And they snatched their sleeves out of the girl's grasp and went and sat down outside, as angry as a couple of tigers.

Wen Shih went out and stood in the doorway of the inn, and she stamped in an agony of rage and indignation, sobbing aloud and screaming out at the top of her voice that she had a grievance.

The innkeeper heard the noise and came running out to try and induce her to be quiet.

"But you do not know, Sir" she cried between her sobs, "how great is my trouble! My husband was thirty years of age and had as yet no son. So he took me to be his concubine and I have been with him constantly now for nearly two years. In a short time I expect to give birth to a child of his begetting. My husband and I cannot live apart from each other—so much so that I have followed him all these thousands of *li*, not being separated from him by one inch. And yesterday, for the reason that his resources for the rest of the journey were but slender, he expressed a wish to go and see a relative of his who lives here. This man, Sergeant Li went with him, and they did not return all night. I was very apprehensive of danger. And to-day the two of them went

out and came back without him. I feel sure that they have done him to death! Please, Sir, do you be a judge between them and me and compel them to give me back my husband. Only then will I be satisfied!"

"Calm yourself, Madam, I beseech you" returned the innkeeper. "These men had no grudge against your husband, nor any cause of hatred. Why should they want to kill him?"

But Wen Shih's sobbing became louder and more vehement than ever.

"You do not know, Sir" she screamed. "My husband is one who was unfortunate enough to incur the enmity of Yen the Minister. I am sure that these two men had secret instructions from His Excellency, or else that they wished to go and claim a reward for their fell work! Please, Sir, of your kindness, help me! . . . I have come with him all these thousands of *li* . . . Why should he disappear like this without a word to me? If he wanted to escape, is it likely that Sergeant Li would have let him? . . . But no; they wanted to please the Yens, and so they murdered him! And what can I do? Where can I turn, I, a woman, all alone? . . . Please, Sir, hold these two assassins, and let me go with them to the Prefect's *yamên*, and there proclaim my grievance!"

When Li Wan and Chang Ch'ien heard this torrent of words and sobs, they did what they could to defend themselves, but they found that they were unable to interpose a single word. And the innkeeper was impressed with what he heard and was inclined to suspect the two soldiers, so he began to feel very sympathetic towards the girl.

"You have, however, no sort of proof for what you say" he said to her. "Why are you so certain that your husband is dead? On the contrary he may well be still alive. Better wait for a day and make certain!"

"Yes, and suppose I do wait for a day" sobbed the girl. "Then these two cruel murderers will make good their escape, and who will undertake to prevent them?"

"But if we had really conspired together and killed your husband" said Chang Ch'ien "and wanted to escape, why should we have come back here?"

"Because you knew that I was an unprotected woman" was the reply. "And you thought that it would be an easy matter to deceive me and rob me of all I possess! That is the reason! So tell me now, what have you done with my husband's body? If I complain to the prefect, you will have to confess then in any case!"

Then the innkeeper, seeing that the girl was so insistent and made use of such dreadful expressions, had nothing further to say. But, by this time, some 40 or 50 people had gathered round to see what all the noise was about, and when they heard the loud lamentations of the girl there was not one of them but hated the two soldiers.

"Go to the *Yamên*!" they urged her. "We will take you to see the *Taotai* himself!"

"My grateful thanks to you, Sirs, for your sympathy!" Wen Shih replied, making a courtesy to the crowd, "and for taking pity upon

my loneliness and helping me in my great difficulties. I beg of you to lead the men along with me, and not to let them go ! ”

“ Yes, that we will ! ” said her sympathizers, “ and we will be responsible that they do not escape ! ”

Upon this, Chang Ch'ien and Li Wan tried to argue with the crowd, but no one would listen to one word that they said. “ Better not argue, you two detectives ” said they. “ The woman's story is either true or false, and if there is nothing in what she says you need not be afraid of going to the Yamên ! ”

So off they started, Wen Shih walking ahead and the crowd following, holding and urging forward the two soldiers. And thus they arrived at the Taotai's yamên.

XV.

That day happened luckily to be the proper day for hearing petitions, but the great gates of the Taotai's yamên had not yet been thrown open. Nevertheless Wen Shih, clad in her white robes of mourning, pushed open the gate of the big fence round the outermost courtyard, and walking up to the huge * drum outside the doors she beat upon it with the drumstick so lustily and so repeatedly that the heavens were filled with the sound and the Taotai's clerks and the gatekeepers inside were frightened out of their seven senses.

A side door was thrown open and a number of men rushed out and proceeded to bind Wen Shih with ropes, saying that she should suffer for her bold behaviour. But she fell crying and sobbing to the earth. “ A grievance ! A grievance ! ! ” she yelled. “ A grievance big enough to push its way up to heaven and split the skies ! ! ”

And just then shouts were heard from inside the yamên announcing the fact that the Taotai was taking his seat in his court. The great doors were then flung open, and His Excellency, Mr. Wang proceeded to prepare for the business of the day.

His first question was one as to the identity of the person who had beaten so loudly upon the drum, and Wen Shih was ushered into his presence. She sobbed out her sad story once more telling of the misfortunes of her husband's family ; how Shen Lien and his two sons had been done to death and how only her husband Shen Hsiang had been left ; how he had been killed only the day before by their escort. Thus, branches and leaves together, the whole tree of her story took shape, and every hearer was impressed with its credibility.

Wang Taotai then called Chang Ch'ien and Li Wan and asked them what they had to say. But when they attempted to speak, the girl at once contradicted them, and every word she said seemed to carry conviction with it. And the two were quite abashed before her.

* A large drum was formerly (and still is, though no longer much used) a fixture outside the main door of every important yamên, and those who had a grievance to be adjusted were in theory supposed to announce the fact by beating the drum. It is probable, however, that a few respectful taps were all that were generally given, and that a vigorous fantasia such as is here described would probably have been looked upon as contempt of court.

"The power of the Yens is very great" reflected Taotai Wang, "and this plotting to kill their enemies is now a matter of constant occurrence. That nobody can deny!" and he told his secretary to place the woman and the two soldiers in close custody and send them on to his inferior the Prefect for examination.

Now this prefect was a man named Ho, and on receipt of his orders he did not dare to delay but summoned the innkeeper also before him and took down the evidence of all four of them, the woman maintaining with the utmost tenacity that the two soldiers had actually done her husband to death.

Li Wan told his story; how he had been detained on his way from the inn and how he followed hard on his prisoner's heels but had lost sight of him. Chang Ch'ien and the innkeeper then gave their evidence and the prefect was at a loss to know what to make of it all. And the whole time the woman did not desist from her sobbing and remained altogether miserable. Her story appeared to bear the stamp of truth and her appearance seemed to support her words, but Chang Ch'ien and Li Wan refused to acknowledge their guilt.

The prefect reflected and after ordering the four of them to be locked up together in an empty cell, he called his sedan chair and went round to visit Mr. Feng and hear what he had to say.

When the latter learned that the prefect had called, he went out to receive him and led him into the guest chamber. Tea was brought, and then His Honour began to speak about Shen Hsiang.

But as soon as Mr. Feng heard this name, he placed his hands over his ears. "That is the man that Minister Yen has a grudge against!" he exclaimed. "Although I happen to be a relative of his I have never had any communication with him whatever! My Old Grandfather*, you the Prefect! I beg of you not to speak to me of this man! If it were to reach the minister's ears that I were suspected of having anything to do with him, I would be involved in the greatest calamity!"; and having spoken thus Mr. Feng rose from his seat. "You are doubtless extremely occupied with official matters of the greatest importance" he went on. "I would not venture, therefore, to keep you waiting here unnecessarily!"

And the prefect who did not relish this treatment left the house at once. "This Mr. Feng" he thought to himself when he got again into his sedan chair "is evidently in such terror of the Yens that Shen Hsiang certainly cannot be in his house. I should say either that the escorts have indeed murdered the man or that he did go to Feng but was turned away at once and went for shelter elsewhere. But where can he have gone to?"

So he went back to his yamen and had the four up again.

"Besides Mr. Feng" he asked Wen Shih, "did your husband know any one else in this city?"

* A term of respect. A magistrate, being of lower rank than a prefect, was called Lao Fu T'ai ('my old Father'). Both were called 'Fu Mu Kuan' or 'Father and Mother Officials,' to indicate the care that they were supposed to exercise over the people.

"No" she replied. "My husband had no friends at all in this place."

"At what time did your husband leave you to make his call on this Mr. Feng?" was the next question. "And at what time did Chang Ch'ien and Li Wan return and report to you?"

"My husband went out yesterday before the noon-day meal" was the reply, "and Li Wan went with him. At four o'clock in the afternoon Chang Ch'ien lied to me and said that we must soon be off on our journey again, and then he went alone into the city. He did not return until quite late and then he told me that my husband and Li Wan were staying the night at Mr. Feng's house and that he himself must go at daybreak and bring them back for we should have to leave as soon as possible. This morning Chang Ch'ien went out at dawn and the two of them came back together, and there was no sign of my husband. If they have not killed him, who has? If my husband did not go to Mr. Feng's, Li Wan should have found out yesterday where he did go! Chang Ch'ien also should have taken more trouble; how could he try to deceive me with fair words about my husband coming back? One can guess the truth from his attitude; it was almost certainly all prearranged on the road hither, and I have no doubt but that it was settled that Li Wan was to kill my husband during the night. This morning when Chang Ch'ien went so early into the city, the two of them probably buried the corpse somewhere before coming back to me with their lies! Now, I pray you, Sir, of your cleverness (which is as bright as the daylight) to see clearly into this matter!"

"What you say certainly seems to me to be very likely to be what actually happened" said the prefect slowly, at which remark Chang Ch'ien and Li Wan began at once to protest, but His Honour silenced them with the following warning:—"You are official messengers" he said sternly. "And the way in which you have fulfilled your trust on this occasion is an outrage! If it is not true that you have plotted to kill this man, it is certain that you have been bribed to allow him to escape! How can you deny it?"

And he told his lictors to give each man thirty blows with the heavy bamboo to loosen their tongues, and they were beaten until the skin was stripped from their persons and their flesh cut open, blood flowing freely. But still they refused to confess. And the girl remained at one side moaning and sobbing as though her heart would break. The prefect, who could not bear the contemplation of her distress, then ordered the ankle-presses* to be brought out and applied to the two lictors, but the latter (who, of course, had not really killed their man) although they endured the most terrible pain, yet did not confess.

* *The Ankle-press.* A simple but diabolical contrivance, consisting of three heavy pieces of wood, each about a yard long, connected together at one end. This frame was placed transversely round the ankles of the unfortunate under examination and the free ends were then brought together by a rope which was slowly tightened, thereby crushing both ankles as two walnuts could be crushed in a pair of nut-crackers with a third limb in the middle. Women were not subjected to this form of examination; a smaller but similar press was applied to the finger-bones.

So the presses were taken off and then applied again, but still no confession came. When the prefect, however, told his men to apply the torture a third time, the two unfortunate soldiers whose fortitude had been exhausted, implored him for mercy.

"Shen Hsiang is not dead! Shen Hsiang is not dead!" they cried over and over again. "We humbly beg of you to set a limit of time in which we may find him. Let us search for him and we will find him without fail and restore him to Wen Shih!"

So the prefect, who was indeed at a loss to know what to do, had perforce to accept this alternative. He despatched Wen Shih to a neighbouring nunnery, and Chang Ch'ien and Li Wan were placed in charge of an escort of four armed men and were told to search the city for Shen Hsiang, a time limit of five days being set. As for the inn-keeper, he was released and allowed to go home, and a full report of the proceedings was sent to His Excellency the Taotai.

Chang Ch'ien and Li Wan were then shackled together, and the four guards took turns, two and two about, to lead them round. The few taels of silver that the two men still had left of their travelling expenses was taken from them by the guard who expended the same in food and wine for their own refreshment, and a sword from the Land of Dwarfs* that was also in their possession was likewise taken and pawned to the same end.

But the range of the search was immense, for the city stretched out widely in all directions, and Chang Ch'ien and Li Wan were by no means able to find their man. Where indeed should they look? It was, of course, merely a way of obtaining a respite from their sufferings.

Meanwhile Wen Shih dwelt among the nuns, but on the fifth day she went again to the prefect's yamén weeping and threatening to commit suicide if her husband were not found. The prefect had thought of one way out of the difficulty and could only repeat the alternate questioning and torture of the prisoners. This took place some six or eight times and no one knew how many strokes they had received. They could at last not even crawl, and Chang Ch'ien died of a disease.† Only Li Wan was left, and he obtained permission to go to the nunnery where he threw himself upon Wen Shih's mercy.

"I, your slave," he declared, "am at the end of my resources! I will now confess all that I know. When we received our instructions before we left Hsüan Hua, the sub-magistrate Chin Shao said that he had had orders from the Viceroy Yang to tell us to kill your husband

* The Land of Dwarfs=Japan. In Ming times the Japanese were commonly called 'Wo K'ou,' 'the piratical dwarfs,' in allusion to their depredations on the China Coast. A similar contemptuous expression ('I'=barbarians) was formerly always used to indicate Europeans. The use of this term was forbidden in the Treaty of Tientsin. The excellence of Japanese sword-blades has, of course, been proverbial for many centuries.

† The torture (including beating) of an accused person was strictly speaking illegal, but as no accused person could be sentenced until he had confessed, such means were found calculated to expedite court-work. Should the death of a person thus treated result, it would have to be reported as having taken place 'from disease.'

on the road and to report his death from disease in a despatch written then and there. We did agree to do this, but of course we never could really have carried out so dreadful a plan. Why your husband disappeared as he did I cannot divine, but in very truth we had nothing whatever to do with his departure as Heaven is my witness. And that is the whole truth. If I have said but one half syllable of falsehood, may my whole family be wiped out! We have now received beatings and torture every fifth day and my brother Chang Ch'ien has already died under this treatment. If I am killed also it will be but adding a grievance to a grievance. Your husband, I feel sure, is not really dead at all and without doubt you will meet him soon once more. I beseech you to abstain from going again and crying to the prefect. I implore you to cease from causing me to be alternately questioned and beaten and thus save my life, dog though I be. And if you hear my prayer it will be accounted by heaven as an act of virtue done by stealth!"

"You say that you have not injured my husband" returned Wen Shih, "but I have the utmost difficulty in believing this. Nevertheless I will have mercy upon you and will take no further steps to get the prefect to order you to continue the search. But all the same you must, go on looking for him continually and there must be no slackening in your efforts!"

"Yes, Yes, I agree, I agree!" cried Li Wan with alacrity: and here is a verse to bear witness to the situation:—

Full twenty taels to cause his death his enemy did pay,
But strange to tell the prisoner was lost upon the way.
The escort then is tortured. This he finds he cannot bear
So for mercy he implores the nun with many a bitter tear!

Now the prefect had set a limit of time within which Shen Hsiang should be found, appointing a rigid system of alternate examination and release, partly because Shen was an important criminal who was wanted by the Viceroy and partly because his wife came weeping daily to him. But this time Li Wan was not fated to die, and an opportunity for releasing him occurred—as you shall shortly hear.

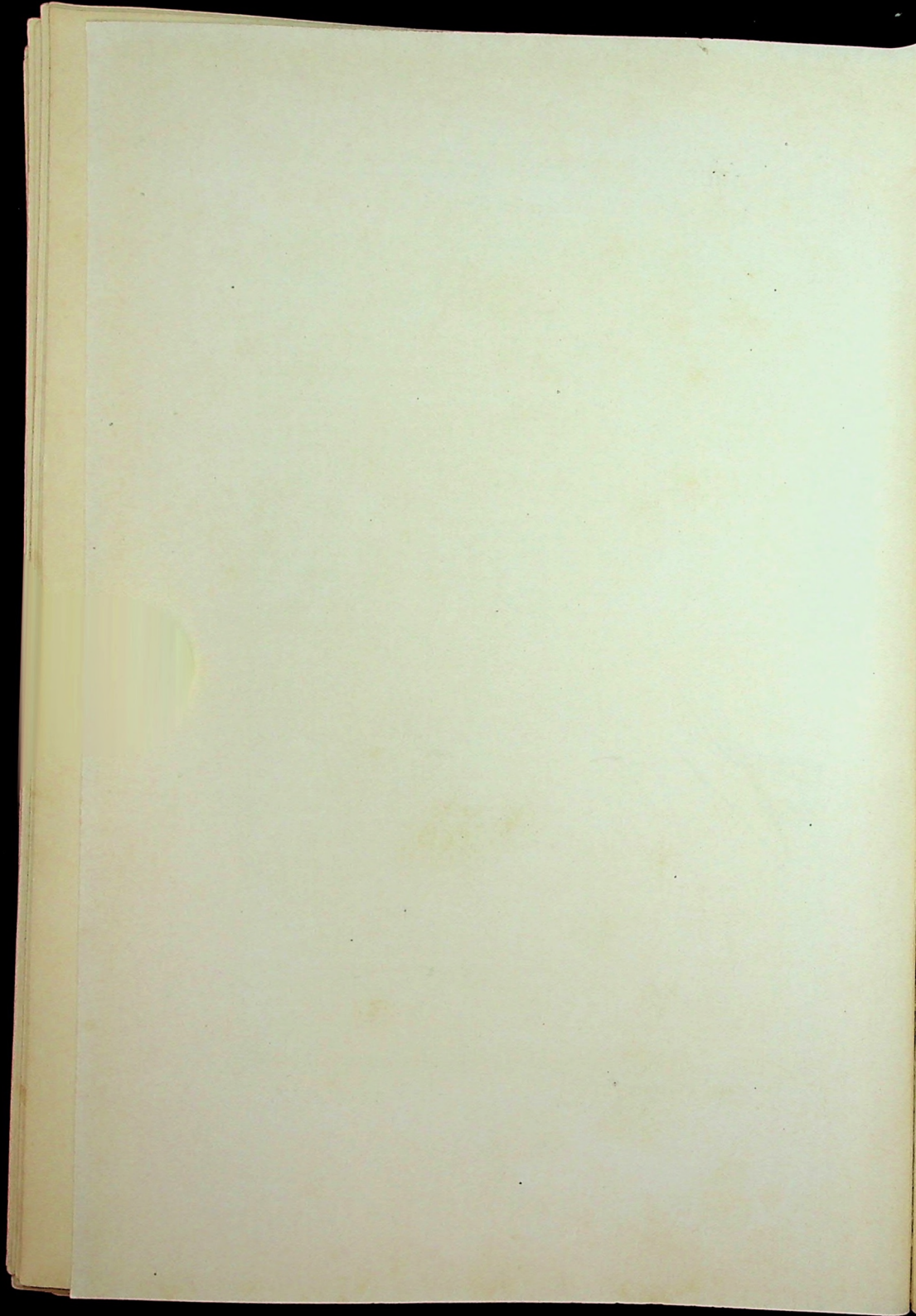
(To be continued).

ANCIENT CHINESE SCULPTURE

(Peter J. Bahr Collection, Shanghai)



Chinese Marble Sculpture. Sui Dynasty, A.D. 581-618. 23" $\times$ 12".



THE POEMS OF LI-PO *

BY

HERBERT A. GILES.

There has recently been published a volume of 236 pages devoted exclusively to 124 poems by Li Po, perhaps the most famous of Chinese poets, who died (?) A.D. 762. The book also contains an appendix with eight poems by other writers in honour of the Master.

These poems have been done ("I thank the author for teaching me this word") into English—it is impossible to add "verse"—by a Japanese, who has had to handle two foreign languages in the process. Of course, one is always glad to find Japanese engaged in the study of Chinese literature, which at one time, barely a thousand years ago, was all they had for purposes of literary culture. The result is that the author is completely satisfied, saying (p.x), "I am inclined to believe that my renderings are often simpler and more exact than other extant versions, which I have studied." At any rate, Mr. Obata pommels his predecessors without mercy, which, in the interests of scholarship, is quite a right and fair thing to do, of course with justification.

I shall leave other translators to defend themselves. He treats my work most gently of all, as follows: "While his dexterous renderings of Li-Po and other poets have been generally accepted as standard English, they fail to create an appetite for more of their kind owing probably to the professor's glib and homely Victorian rhetoric which is not to the taste of the present day." I do not in the least resent this opinion, which Mr. Obata is perfectly free to express; though I might perhaps fairly object to his denunciation of me for (p. VIII) "accepting the tempting morsel of legend about Li-Po's drowning," when I find that he himself, evidently forgetting all about my lapse, has himself on pp. 16, 17, accepted and amplified this evidently very tempting morsel. What I am concerned with now is the meaning of the Chinese poems which Mr. Obata claims to have given in simple and exact English; and what I now assert is that his volume is packed with mistranslations which wholly distort the meaning of the poet, and are often couched in language that would make any meaning unintelligible. Throughout his volume Mr. Obata persists in the very unscholarly practice of leaving out aspirates and diacritical marks, for which he makes a very lame apology on p.x. He writes of Li *Tai-po*, the *Tang* dynasty, *Chang-an*, *Tai-ping*, *Po Chu-i*, etc. etc.; hideous solecisms which make it impossible to reproduce the correct Chinese pronunciation. What would be thought of a western scholar who wrote of Ercules, Ephæstus, Ermione, Ermes, etc., etc.? If anything, the aspirate is of more importance in Chinese than in Greek. *Chang* and *Ch'ang* are almost as dissimilar to a Chinese ear as *chalk* and

* The works of Li-Po, the Chinese Poet, done into English verse by Shigeyoshi Obata, New York, 1922.

cheese; and it is a thousand pities that the Chinese Postal Service has tolerated such mauling of the language as appears on the official stamp of *Changsha* for *Ch'ang-sha*.

As a tribute to the genius of Li-Po, and in the hope of soothing the wounded feelings of his ghost, I have taken at random one of his most popular but untranslatable poems and have made a version which I would now substitute for that "done into English verse" by Mr. Obata. My glib and homely Victorian rhetoric will naturally tell against me; but even with that handicap, I do not despair of some success. I will give Mr. Obata's attempt first, with notes, and then follow on with my own.

The subject is supposed to refer to the flight from rebels of the Emperor Ming Huang, A.D. 756, of which step the poet expresses his disapprobation.

(*Mr. Obata's Translation*)

THE STEEP (1) ROAD TO SHUH

Alas! how precipitous! Alas how high!
 The road to Shuh is more difficult to climb than to climb the steep
 (2) blue heaven.
 In the remotest time (3) of Tsang-tsung and Yu-fu—Yea, forty (4)
 millenniums ago—that land was founded.
 Yet from the wall of the Middle Kingdom runs no highway thither,
 no highway linking human dwellings; (5)
 Only a lone precipitous path—the bird-way—was built,
 Leading westward toward the evening star,
 And trailing across the forehead of the Yo-mei mountain.
 And how those strong men died, traveling over! (6)
 The earth sunk and the mountains crumbled.
 At last there is now a road of many ladders and bridges hooked
 together in the air. (7)
 Lo, the road-mark (8) high above, where the six dragons circle the
 sun!
 Lo, the stream far below, winding forth and winding back, breaks
 into foam! (9)
 The yellow crane could not fly over these mountain-tops;
 And the monkey's wail, unable to leap over these gorges.
 How the Green (10) Mud path turns round and round! There are
 nine turns to each hundred steps.
 The traveller must climb into the very realm of stars, and gasp for
 breath; (11)
 Then draw a long sigh, his hands on his breast.
 Oh, why go you (12) west, I pray? And when will you return?
 I fear for you. You cannot clamber over these jutting rocks.
 You shall see nothing by day (13) but the birds plaining bitterly
 on the aged trees, the female following the male in their
 flight; (14)

You shall hear no voice but the cuckoo's calling in the moonlight
by night, calling mournfully in the desolate mountains. (15)
The road to Shuh is more difficult to climb than to climb the steep
blue heaven.
A mere story of it makes the youth's red face grow pale.
The lofty peaks shoot up cloudward in rows. (16) If one foot higher,
they would touch the heaven.
The dead pine trees cling to the cliff, hanging headmost (17) over the
abyss.
The sparkling cascades and the spurting torrents vie with one another
to make the bellowing din.
Anon, a giant boulder tumbles from the crag-head; a thousand
mountain walls resound like thunder. (18)
O you wayfarers from afar, why do you come hither on this direful
road?
The gate of the Sword Parapet stands firm on its frightful height. (19)
One man defending it, a thousand men (20) could not break it open.
And the keepers of the gate are not of your kin,
They may turn, I fear, (21) to wolves and leopards.
Fleeing at morn before the savage tigers,
Fleeing at eve before the huge serpents, (22)
Men are killed and cut up like hemp,
While the beasts whet their fangs and lick the blood. (23)
Though many pleasures there may be in the brocade city of Shuh, (24)
It were better to return to your house quickly.
The road to Shuh is more difficult to climb than to climb the steep
(25) blue heaven.
I shrug my shoulders and heave a long sigh—gazing into the west.

Notes.

1. The Chinese word *nan* 難 has no such meaning as "steep."
2. "Steep" is not to be found in the text.
3. "In the remotest time" is not to be found in the text.
4. The text has "four" not forty" millennia. Ts'an Ts'ung (not Tsang Tsung) was the first king and Yü Fu the third.
5. This and the following three lines are not translation at all, but very inaccurate paraphrase. For instance, there is nothing about the "evening star" or about "the forehead" of Mt. O-mei.
6. There is no text for "traveling over." This and the next line are wrongly transposed.
7. "Hooked together in the air" does not render the text (相鈎連).
8. "Lo, the road-mark" is an entire misconception of the meaning (高標).
9. "Breaks back into foam" is not in the text.
10. Mr. Obata evidently does not know that *Ch'ing* (青) means black as well as green and blue.
11. "Round and round the mountain-peaks" is omitted. Why not translate the line? Paraphrase here spoils the text.

12. "Why go you?" is not in the text.
13. "By day" is not in the text.
14. "Here and there in the forest" is omitted.
15. "Cuckoos" don't "call in the moonlight."
16. There are no "lofty" peaks or anything about "shooting up cloudward in rows."
17. "Headmost" has a very different meaning from "upside down" which is required by the text.
18. There is nothing about "mountain walls resound like thunder."
19. This line is altogether mistranslated.
20. The text has ten thousand (萬夫).
21. There is no "may" or "I fear" in the text.
22. These two lines are one in the original, and are incorrectly rendered.
23. The above two lines are one in the original, and are here mercilessly mistranslated.
24. "Ch'eng-tu" (成都) seems simpler and more informative; otherwise few readers would know which city was meant.
25. See note 2.

(Suggested Translation).

DIFFICULTIES ON THE ROAD TO SHU (SSUCH'UAN).

1. Alas and alas for the perils of those heights!
2. The difficulties on the road to Shu are greater than those to the blue sky.
3. Ts'an Ts'ung and Yü Fu how widely did they open up their State,
4. Forty-eight thousand years ago,
5. Linking up its people with those of our land of Ch'in.
6. Westward, on the Great White (snow covered) Mountain, there was a bird-path.
7. By which Mount O-mei could be crossed.
8. Here the earth was riven, the mountain crumbled, and the five strong men died.
9. Later, came long ladders, and covered ways of stone strung together like *cash*.
10. Above there are the six dragons which circle around the lofty beacon of the sun;
11. Below are hurtling waves which strike the rocks with swirling eddies.
12. The yellow crane in its flight cannot pass over these;
13. The gibbon would cross, but dares not face the climb.
14. How the black mud curls by!—nine coils in a hundred paces—
15. Round and round the mountain-peaks until you touch Orion and pass through Gemini.
16. And looking up, you catch your breath, beat your breast, and sit down deeply sighing.
17. Pray, Sire, when will you return from your journey to the West?
18. I fear that you will reach rocky ridges which you cannot climb;
19. You will see birds calling mournfully among the old trees.

20. The cock flying, with the hen following, here and there in the forest ;
21. You will hear the nightjar crying to the evening moon and grieving over the desolate hills.
22. The difficulties on the road to Shu are greater than those to the blue sky ;
23. They make the bloom of youth fade from those who hear the tale.
24. The chain of peaks is scarce a foot distant from the sky ;
25. Old pine-trees, head downwards, cling to the steep cliffs ;
26. Flying torrents and cascades flowing vie in the bellowing din ;
27. Huge boulders roll down and thunder through the valley.
28. In such perils, alas for your travellers from afar ! Oh why have you come hither ?
29. The high-pitched Sword-Pavilion (mountain) has terrific precipices,
30. And one man at the pass will hold back ten thousand heroes.
31. Its guardians, for those not of their race, take the shapes of wolves and wild dogs.
32. By day there are fierce tigers to be avoided ; by night, long serpents,
33. Which with whetting of teeth and sucking of blood, destroy man as though mere hemp.
34. And although there is talk of the delights of Ch'êng-tu, better far to hurry home.
35. The difficulties on the road to Shu are greater than those to the blue sky.
36. I turn myself towards the West and utter a long alas !

Since writing the above, I have seen the translation by Mr. A. Waley, published in "The Asiatic Review," N. S. 15, 1919, but not that by Miss Lowell (? Mrs. Ayscough), both of which are mentioned by Mr. Obata as "brilliant achievements to which I am heavily indebted." Altogether, though I cannot agree with several of Mr. Waley's renderings, I am bound to say that, in my opinion, the paraphrastic liberties he takes with the text offer a nearer acquaintance with its meaning than Mr. Obata's "simpler and more exact renderings." It is true that Mr. Obata draws attention to "a curiously elaborate piece of mistranslation" by Mr. Waley ; but we all make some mistakes, and I will now point out a few passages in which I myself differ from Mr. Waley's version.

For my line 9 Mr. Waley has—"So afterwards they made sky ladders and hanging bridges," thus omitting the last three puzzling words.

Line 10. "Above, high beacons of rock that turn back the chariot of the sun." The text has nine words : Above—have—six—dragons, circle—sun—arrive—high—beacon. The chariot of the sun drawn by six *ch'ih* yellow dragons seems to be an importation from Greece, of late usage ; the six *tung* ordinary dragons, without a chariot, carry us back to the ancient Canon of Changes, with allusion to the six dragons as "The

Guardians of God." (The word translated by its original meaning "arrive," changes the preceding word "sun" into the possessive "sun's.")

Line 15. "Clutching at Orion, passing the Well Star,"—omitting translation of three difficult characters.

Line 29. "The Sword Gate is high and jagged."

Line 31. "The guardian of the Pass leaps like a wolf on all who are not his kinsmen." The text has literally: Who—guard—if—not—kin—change—be—wolves—wild-dogs,—making singular or plural optional.

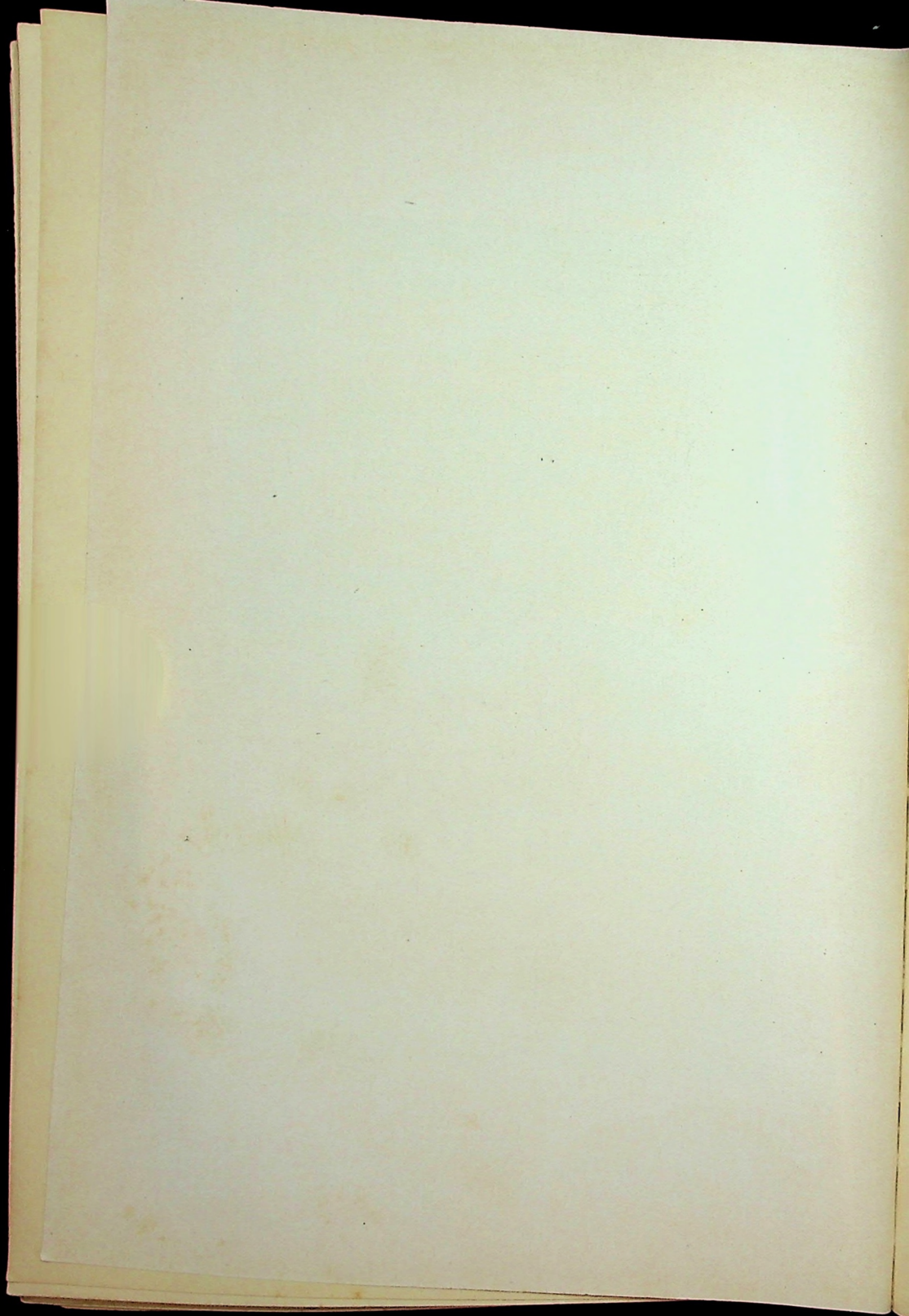
Messrs. Obata and Waley both have "monkey" (line 13) where "gibbon" is preferable; both have "green" (line 14) where black seems more likely for "mud"; and for Mr. Obata's "cuckoo" (line 21) Mr. Waley has "nightingale," though there is no doubt that a very different bird is meant.

ANCIENT POTTERY OF CHINA

(George Croft's Collection, Toronto)



Pottery Figures. Tang Dynasty. Gods and Guardians of the Tomb.



THE GREAT WALL

When your baby boy is born
Hide the ill-starred thing at morn.
Dress him as a girl ; he then
May escape the fate of men.

Gigantic wall. The Monster : See—
Stretching on ten thousand li.
Look along it—scattered close—
Human bones. Ah, heavy woes !

Folk-Song from Second Century B.C.
Translated by ELFRIDA HUDSON.

LOTUS LEAVES

The lotus leaves are goblets,
Tall, long-stemmed goblets,
Lifted to a pouring moon.
Their fluted sides
Compass a sparkling wine,
White, wine of light,
Poured into cups of chlorophyll.

Slim-stemmed lotus leaves,
On a moon-lit pond,
In a walled garden of Cathay,
Are tall, green goblets on a crystal board.
Drink, drink the heady nectar that they hold,
Savor an ancient beauty,
Drink deep its oriental wine,
Its rare, immortal vintage !

By MAUD HUBBARD BROWN.

A TAOIST PRIEST

Through a Cathay Valley, shadow fringed
With age—old trees by Autumn tinged,

Past many a fortress in decay
The donkeys wend their tortuous way.

The gorge is crossed and on we ride
Quite slowly up the mountain side

To a forest temple, sombre, deep—
Where Taoist priests their vigil keep.

This priest is young ; he sits beside
The door and sees the shadows slide

Like noiseless phantoms down the sky
Or frightful demons rushing by,

Or at the desert stark and vast
With Gobi sand and sparse sedge-grass

And camels slowly passing by
In silhouette on rose tint sky.

The cypress trees are straight and tall
That stand beside the cool grey wall ;

The wind plays love songs in their leaves ;
The Taoist's brain a fancy weaves ;

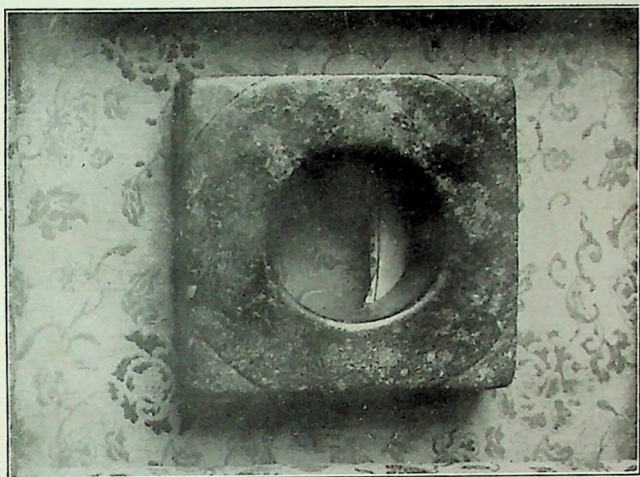
He sees a face framed in a star,
He hears upon the mountain far

The tinkle of the sheep-herd's bell
And whispers faintly, " All is well ! "

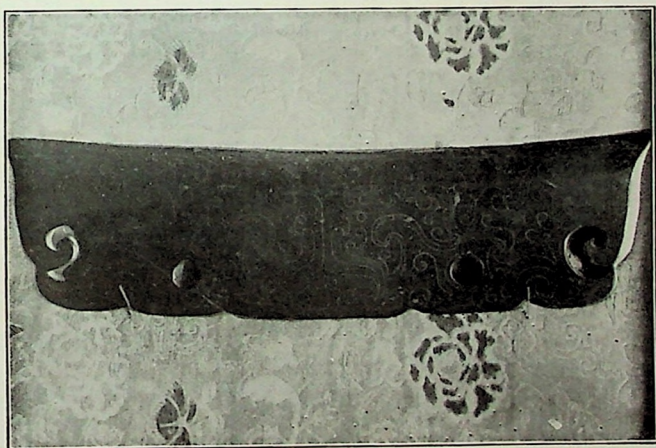
INA LONG.

ANCIENT CHINESE JADES

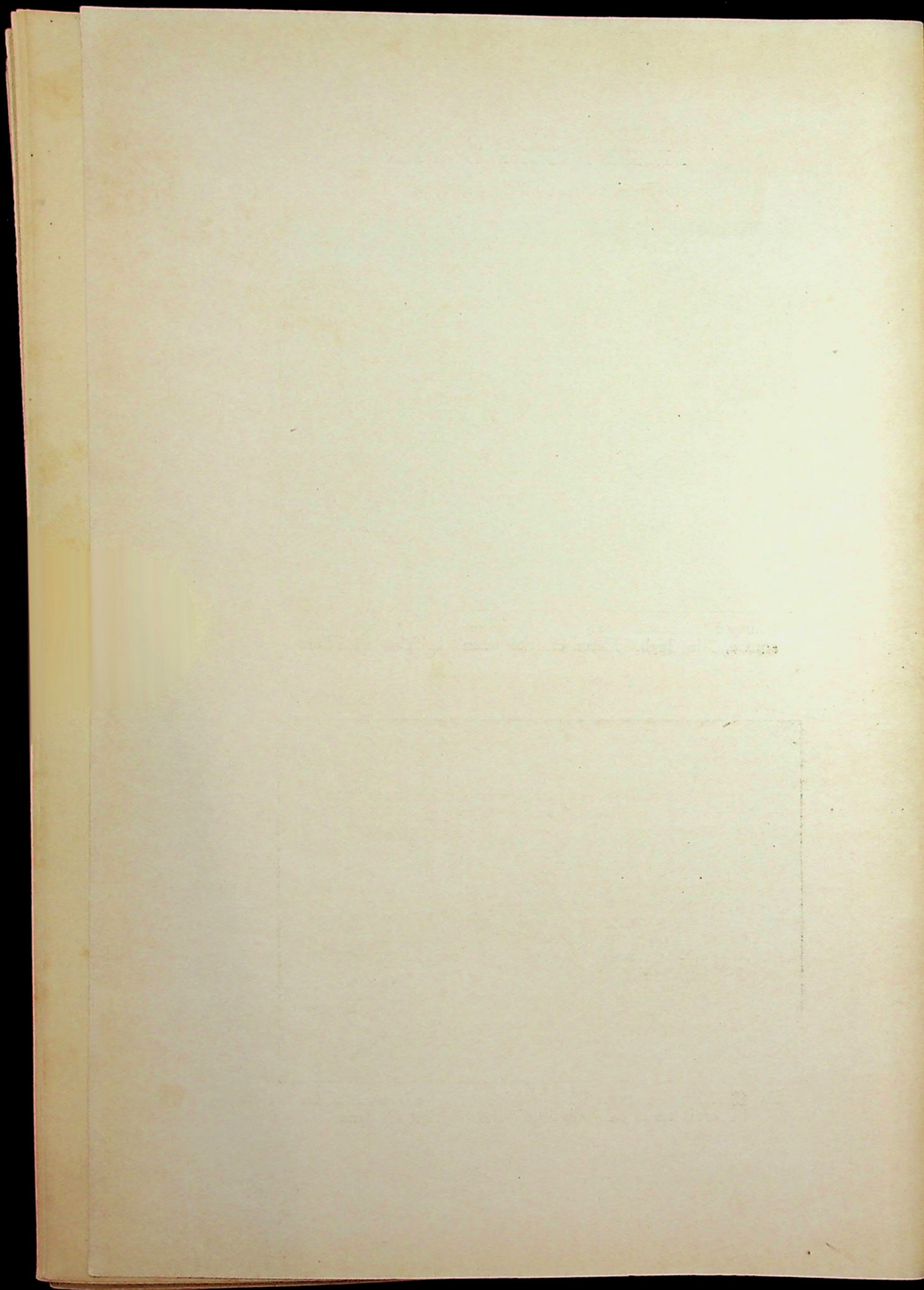
(From the K. C. Wang Collection)



Chung 琮, Chow Dynasty (Red, White and a Little Green). 6-in. square, 3-in. high. Placed on Alter when Sacrificing to the Earth.



F'u 笏, Chow Dynasty. When a King or Duke interviewed his Subordinates to held this in his Hand against his Arm.



EDITORIAL COMMENTS

DISCOVERY OF NEW TEXT

Among the many recent finds in the province of Honan none is of greater interest than a stone on both sides of which are inscribed portions of ancient classical texts. It was found at a place south of the Lo river in the district of Loyang. This stone bears a date of a year of Chêng Shih 正始 (A.D. 240-249) of the Wei dynasty. On one face of the stone is a portion of the Spring and Autumn classic—Ch'un Ch'iu 春秋, taken from the Hsi Kung 僖公 (Legge Bk. V) and the Wên Kung 文公 (Legge Bk. VI) sections. On the other face are portions of the Wu I 無逸 and Chün Shih 君奭 sections of the Shang Shu 尚書. The text of this stone is written in three styles of character, ancient 古文, seal 篆 and official 隸, and it is therefore known as "The stone classic written in three styles" 三體石經. In several instances it varies from the other well-known "stone classic written in three styles," A.D. 175, under the orders of the Emperor Ling Ti 靈帝 of the Later Han dynasty. Rubbings of this text are in the hands of several eminent textual scholars who are making a critical study of them. The results of their investigations are awaited with great interest. The photographs of this text which are herewith appended were taken from the rubbings. The stone has been cut in two pieces, one of which is now kept in the yamén of the Loyang magistrate and the other in the possession of Mr. Chang of Loyang.

J. C. F.

THE LAN-T'ING PAVILION

No place is more noted in Chinese literature than Lan-t'ing, situated about nine miles southwest of the city of Shao-hsing in Chekiang province. It was at this spot that the great calligraphist Wang Hsi-chih 王羲之 (A.D. 321-379) of the Chin dynasty gathered his group of forty-one friends on the third day of the third month of the ninth year of the Emperor Yung Ho (A.D. 347) for the purpose of celebrating the ancient rite of driving out evil influences (驅疫禳). A plentiful supply of wine was provided to aid their worthy endeavours, and this was stored in large jars. The group was seated along the banks on either side of the winding stream while servants filled small goblets with wine and placed them in the current. As these were seized by the eddies and hurried to the banks it was the duty of the one seated nearest to the goblet to grab it and drain its contents. It was a merry game and it stirred the emotions of the guests. On this occasion Wang Hsi-chih wrote a famous poem commemorative of the occasion, and the script in which it was written, the Lan-t'ing T'ieh 蘭亭帖, is the most famous in the long history of Chinese calligraphy.

The photographs represent this famous place as it may be seen at the present time and were taken in November, 1923.

J. C. F.

BIRDS IN CHINESE POETRY

The following interesting letter has been received from Mrs. Ayscough, who is well known as a translator of Chinese poetry.

To the Editor.

SIR,—In the May number of your Journal I have read, with deep interest, Mr. Arlington's article on "Birds in the Poetry of the Chinese," and write to ask if you can tell me why he refers to the Pai Shē 百舌 as the lark: Giles' Dictionary No. 9788 gives: 百舌 a kind of mainah; see No. 3087 applied in Chihli to the starling (八哥 see 6045). The entry under 3087 reads: 鸛 Ch'ü, mainah, *Acridotheres cristatellus*, and that under 6045 gives 八哥 Pai Ko, *Acridotheres cristatellus*.

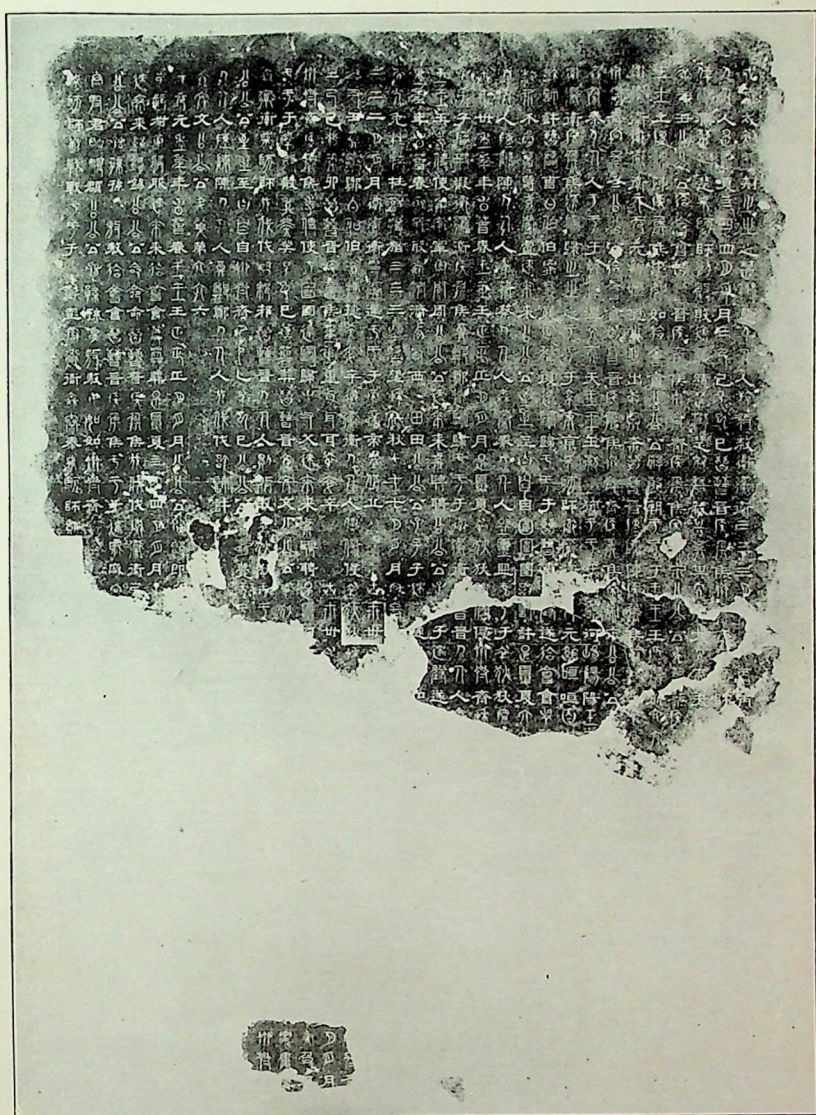
I especially wish to know as the poem by Tu Fu, which Mr. Arlington quotes, is among those which will probably appear in the book of poems I am now preparing. The Chinese scholar with whom I have studied says that the Pai Shē—"Hundred Tongues," although it is a sort of mainah, is not the Pao Ko which we know so well in Shanghai; and from a description of the bird's habit it seems more like a starling than a lark. A commentary to the poem reads: "A popular saying is that on the day of Mang Chung 芒種 ("Bearded Grain," which falls about June 6) the praying mantis is born; that five days later the shrike calls; and five days later again, the Pai Shē—Hundred Tongues—ceases its song and should not be heard again during the year. If it is heard again people say there must be a bad adviser by the Emperor's side."

The poem itself is an allusion to the corrupt Ch'êng Yüan-chên 程元振 favourite of Tai Tsung of T'ang who reigned A.D. 763-780. It so happened that when Tu Fu wrote the poem Ch'êng had already been removed from power, but the poet, who was then living at Ch'êng Tu in Szechuan, had not heard the good news and still mourned the influence which had been acquired by him who would "only proclaim the Spring"; i.e., would only make favourable reports to the Emperor, although the country was in a state of anarchy.

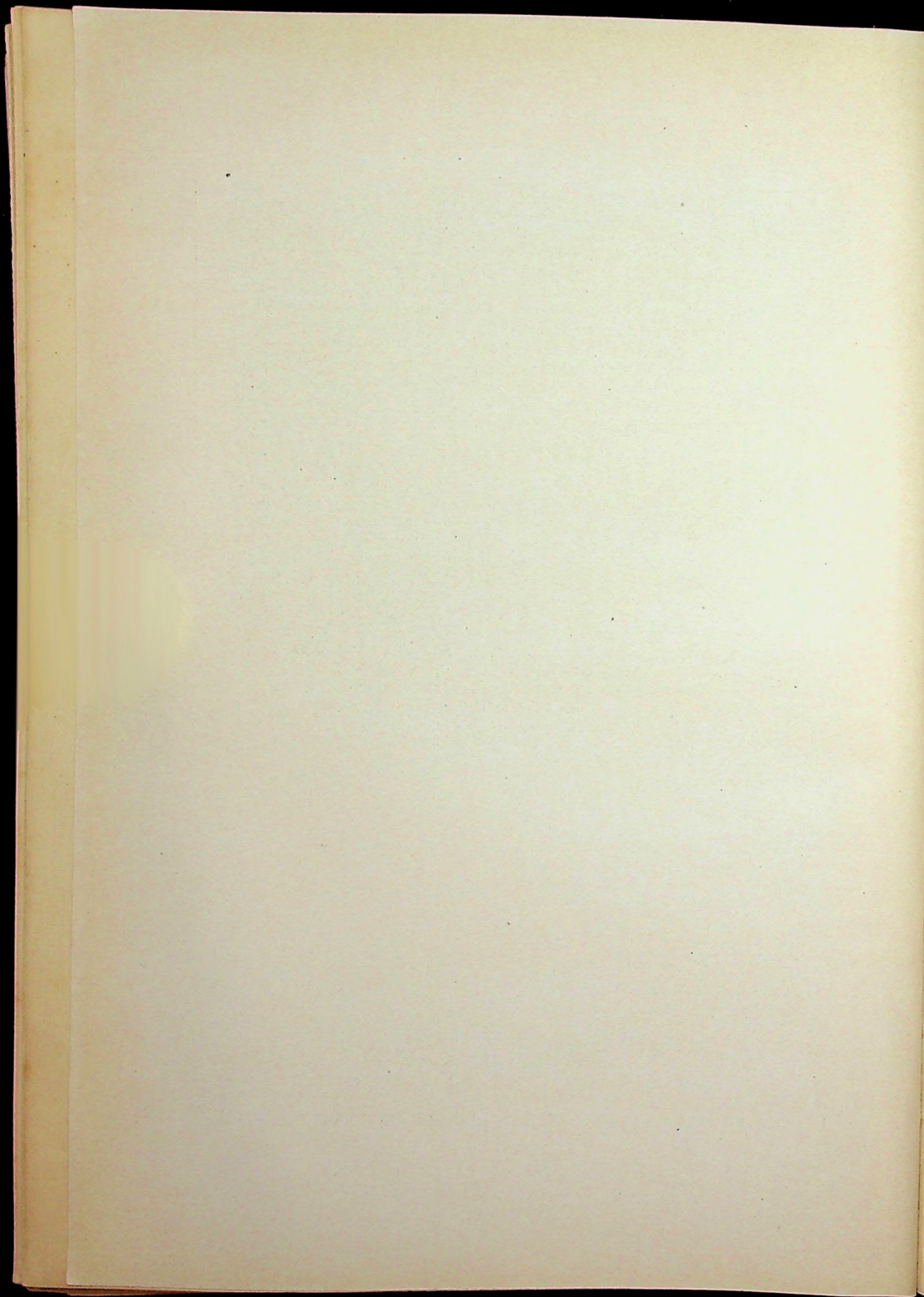
Mr. Arlington has only given half the poem, which in its entirety, reads:

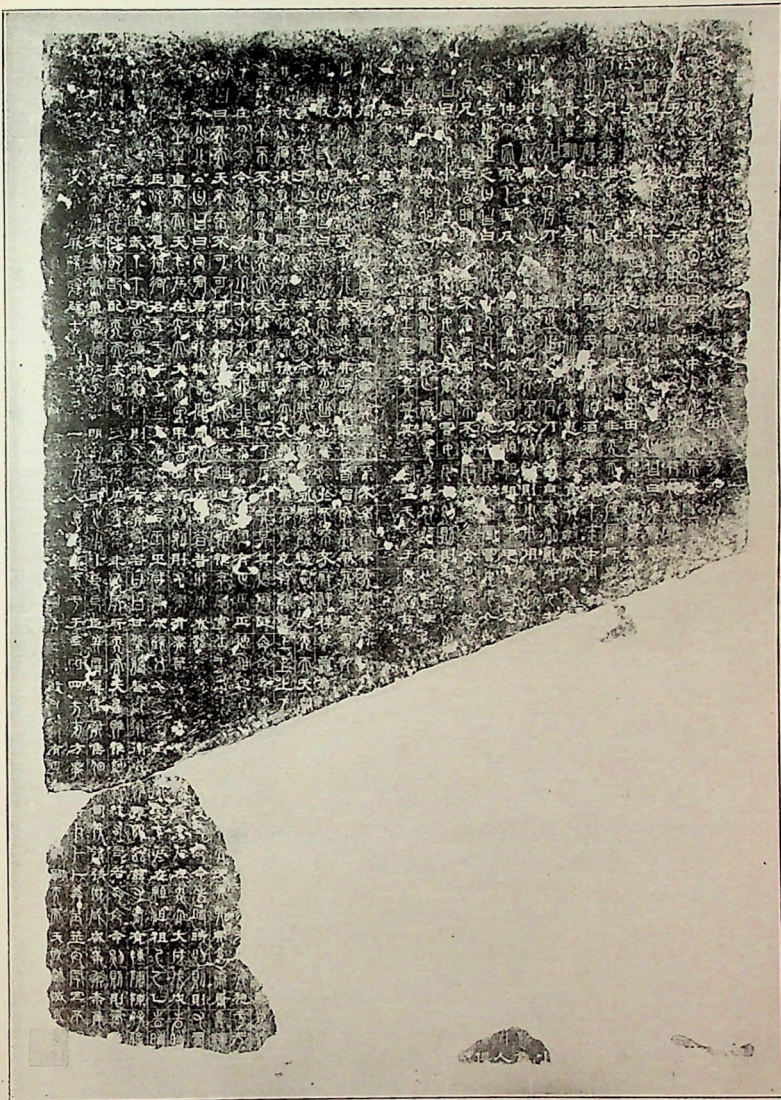
The Hundred Tongues.

Where does the bird of a Hundred Tongues come from?
Again and again he only proclaims Spring.
He knows the sound of all word combinations;
He preens and rearranges his feathers. Can he have many
bodies?
The blossoms are thick, he is hidden and difficult to see;
The branches are high, fresh sounds are heard continuously.
When his season is past—if sounds come from his beak,
There are men beside the Emperor, who misrepresent affairs.



Portions of the Hsi Kung and Wen Kung Sections of the Spring and Autumn Classic





Portions of the Wu I and Chün Shih Sections of the Shang Shu.

君側有讒人
過時如發口
枝高聽轉新
花密藏難見
整翻豈多身
知音兼衆語
重重祇報春
百舌來何處
百舌

It is quite true that in choosing the poems for "Fir-Flower Tablets" Miss Lowell and I did not consider ornithology, but it is hardly fair to say, as Mr. Arlington does, that in our book "birds are conspicuous by their absence." I find that in our collection of one hundred and thirty-seven pieces, among the birds referred to are: kites, vultures, nightingales, yellow geese, wild geese, magpies, orioles, swallows, parrots, white herons, yellow herons, mandarin ducks, jackdaws, gulls, pheasants, cocks and chickens, to say nothing of the fabulous birds such as the Silver-crested Love Pheasant, the Green Fire-bird, and the Jade Love-bird.

Speaking of parrots Mr. Arlington says that as far as he knows "there is only one ode to a parrot by a Chinese." Tu Fu wrote the following poem, which may interest your readers, and I have also heard of a "Parrot Fu" which I cannot place at the moment:—

The Parrot, by Tu Fu.

The parrot harbours mournful thoughts;
Astute, intelligent, he broods over his far distant banishment;
His kingfisher-green robe is all sparse and poor,
It is for naught that his red beak can tell so much.
There is no day when his cage is opened,
It would be in vain, the branch where, formerly, he passed the
nights, is destroyed.
People of the World love, yet injure him—
Of what use is his rare plumage?

何用人憐復損
羽毛奇
世殘舊宿枝
空殘舊宿枝
未有開籠日
紅嘴漫多知
翠衿渾短盡
聰明憶別離
鸚鵡含愁思
鸚鵡

The last line is an allusion to a certain Yang Hsiu 楊修 to whom the great Ts'ao Ts'ao 曹操 was at one time most devoted. Later, however, becoming jealous of Yang's talents Ts'ao Ts'ao ordered that he be put to death.

I always look forward to the arrival of the China Journal of Science and Arts, and wish it continued longevity and wide success.

Yours sincerely,

FLORENCE AYSCOUGH.

St. Andrews, New Brunswick, Canada,
June 14, 1924.

This letter was sent on to Mr. Arlington who makes the following reply:—

Peking, 2nd August.

DEAR DR. FERGUSON,—With reference to Mrs. Ayscough's remarks in her paper, I may state that I had looked up Giles' dictionary, and noted that he called the 百舌 "a kind of mainah," but from the description given of the bird in Chinese books, I could not agree with Giles' definition, and called it the lark. The Chinese lark is *grey*, and all the Chinese books I have referred to give that colour, notably the 易緯通卦. Further, the 百舌 is the book term, and it is a safe bet that 99 Chinese out of 100 do not know what a 百舌 is! The common name for it is 百靈 which Giles (No. 8560) correctly defines as the Mongolian or Shantung lark.

Mrs. Ayscough suggests the starling, but the starling is of a rich metallic black colour, spotted with yellowish white it cannot be the bird the Chinese books refer to, nor can it be the mainah, and most important of all, I have yet to learn that the starling imitates the notes of various birds as the lark does, and as the lark, or rather the sky-lark, is the lark of the poets, I think we may safely assume that the 百舌 is the lark rather than the starling or mainah. However, I would like to have Mr. Sowerby's opinion on this point.

Mrs. Ayscough calls attention to the fact that there are numerous birds referred to in "Fir-Flower Tablets."

I had not overlooked that fact, what I meant to imply, of course, was, that there were no sonnets on birds, and regret very much indeed, that the way I put it led to a misunderstanding.

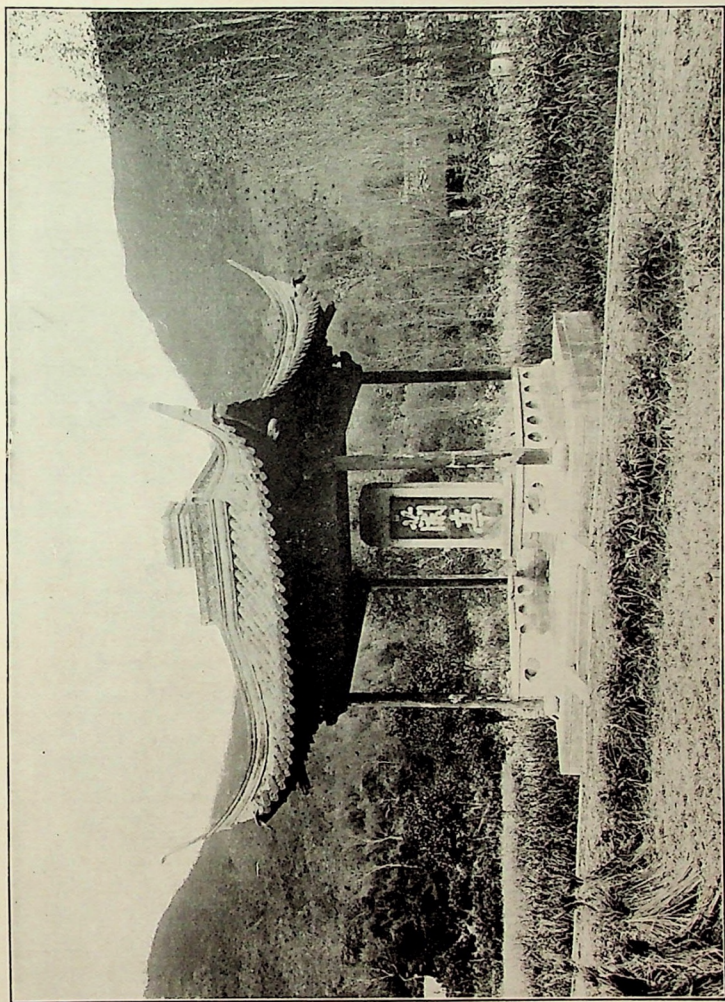
Yours sincerely,

L. C. ARLINGTON.

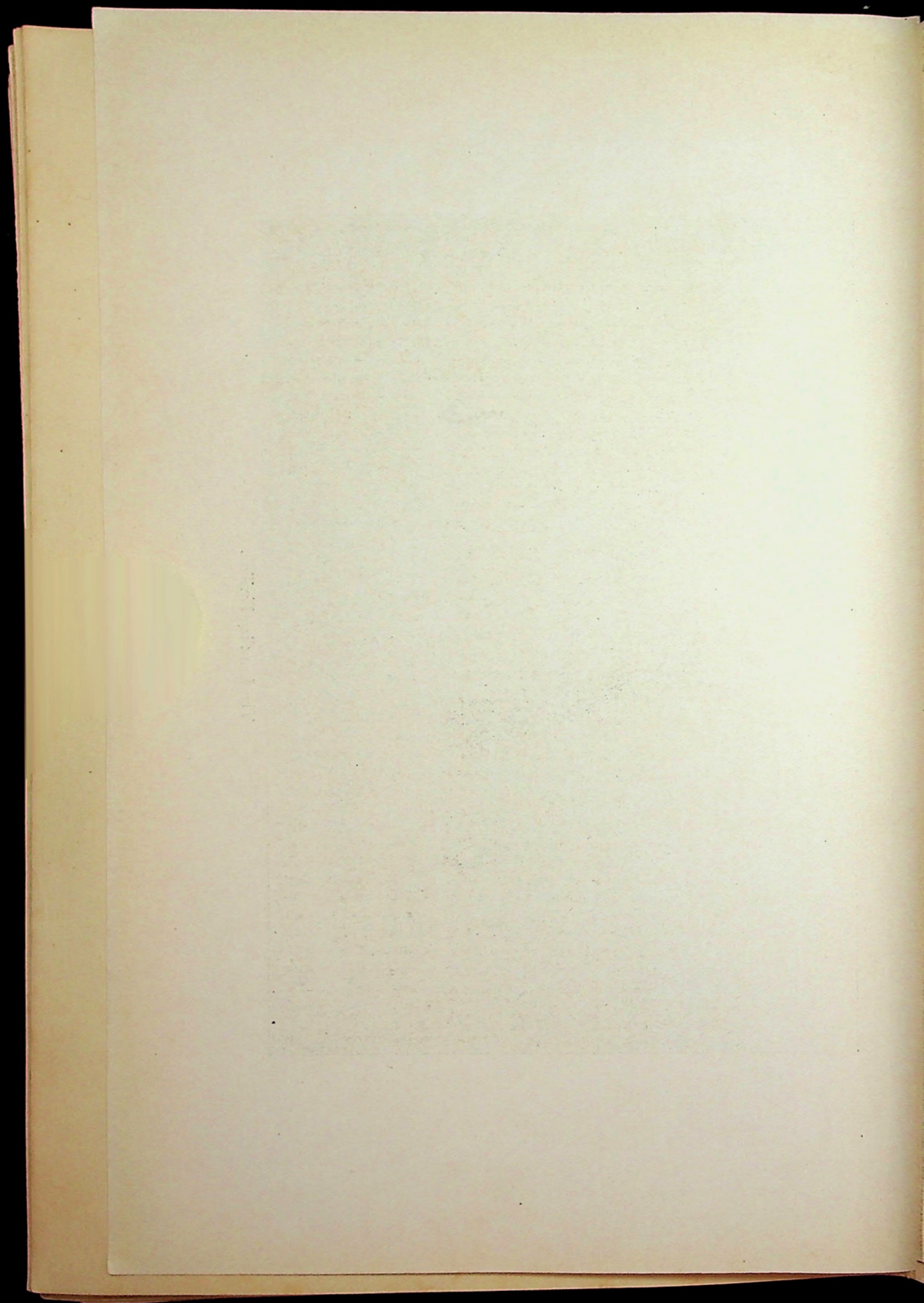
In our opinion Mr. Arlington is right in translating Pai Shê as the lark. The Mongolian lark (*Melancorypha mongolica*, Pallas) is probably the most popular song bird known to the Chinese. It is taken in enormous numbers in the autumn and spring in Inner Mongolia and exported to all parts of China, where, in a characteristic cage, it graces almost every shop front and home, especially of the middle classes. Its powers of mimicry are extraordinary, the bird being able to imitate the songs of all other birds, as well as the calls of cats, dogs, crows and kites, the chattering of jays and magpies, and certain noises that occur in the vicinity of its cage. In this capacity it is far superior to either the myna or the starling, and well deserves the name of "hundred tongues." Its popular or common name is Pai Ling. Mr. Arlington is not correct in describing the starling in China as of a "rich metallic black." This could refer only to the European bird. All the Chinese starlings—and there are several species—are grey in plumage. Again, starlings are well known for their powers of mimicry as also are the mynas.*

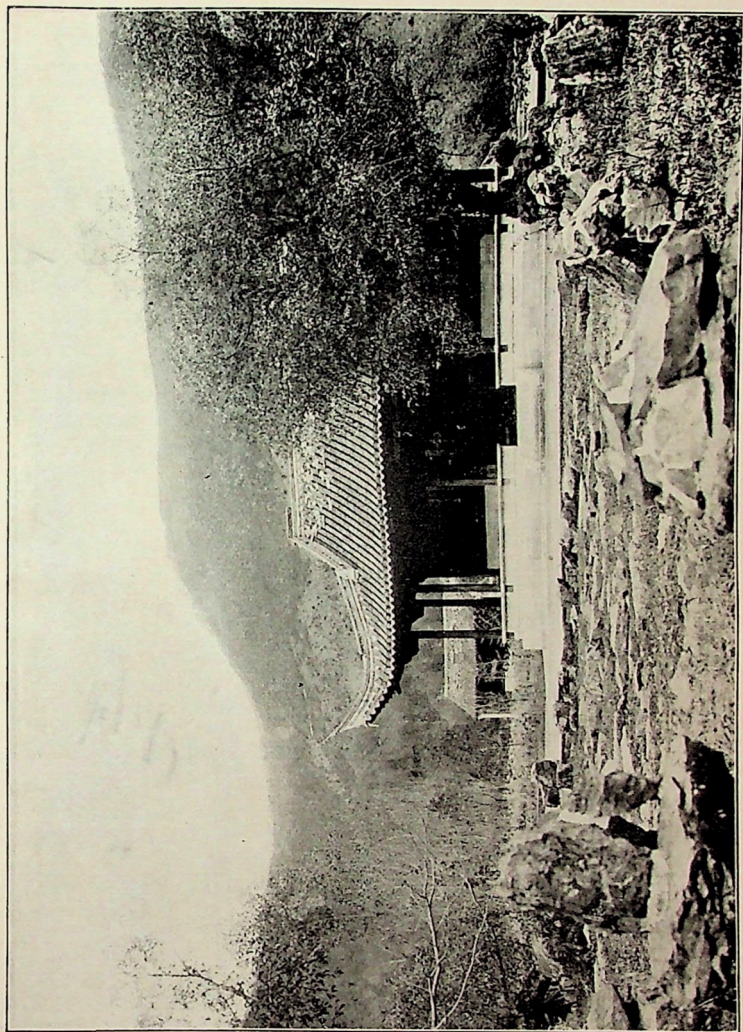
A. DE C. S.

* This is the correct spelling of the word, and not mainah.—Ed.

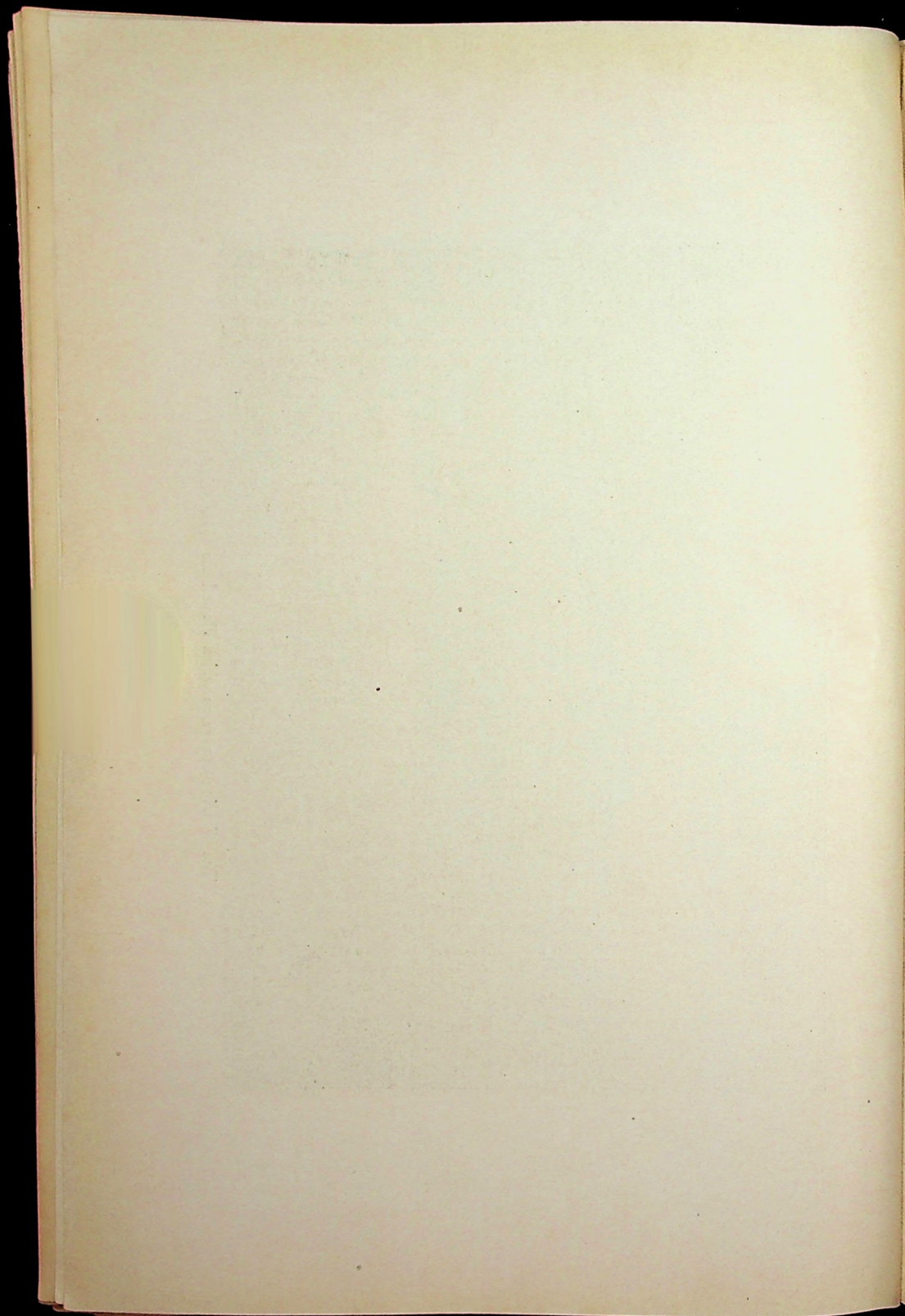


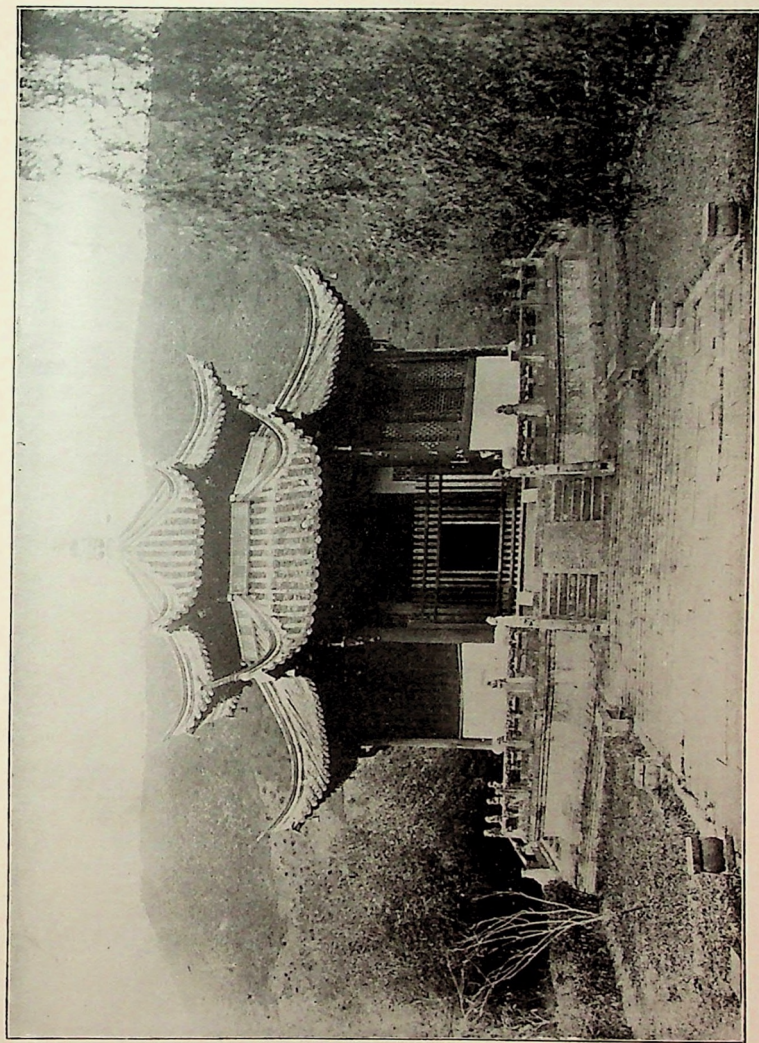
The Lan-t'ing Pavilion.



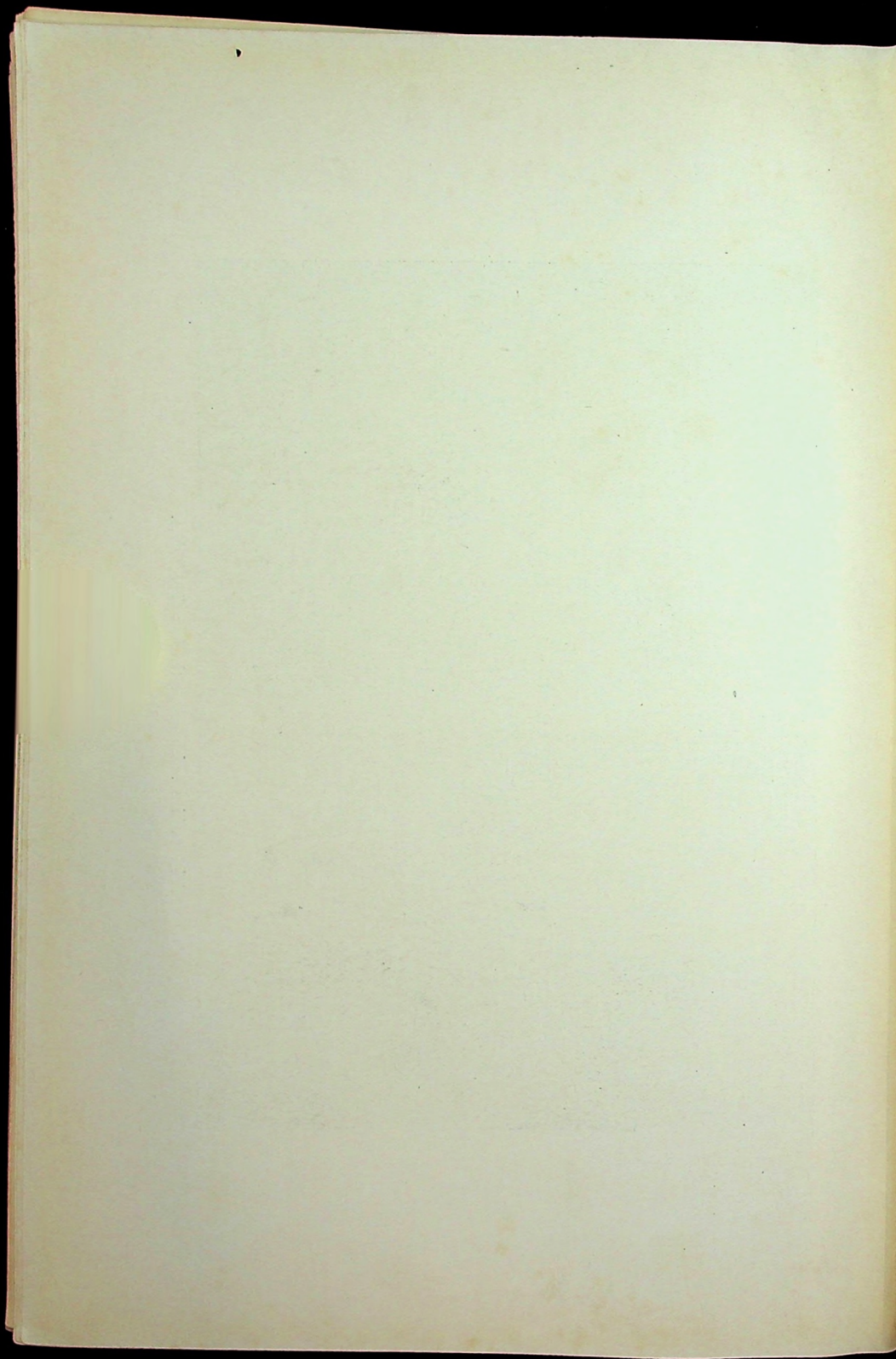


The Winding Stream on which Floated the Wine-goblets





The Pavilion which covers the Lan-t'ing Tablet.



REVIEWS

SANSKRIT DICTIONARY, By A. A. Macdonell: Oxford University Press; London, Humphrey, Milford; 1924.

We are glad to announce that a new edition of this practical Sanskrit dictionary has appeared. The impeccable scholarship of Dr. Arthur Anthony Macdonell, Boden professor of Sanskrit in the University of Oxford, is known in all places where Sanskritists live, and the dictionary just re-issued by the Oxford University Press has ever since its original publication been regarded as a standard work by indologists.

The scope of the work is restricted and it aims mainly at satisfying the wants of those who are interested in the so-called classical Sanskrit literature; only a few Vedic texts are included in its orbit, and the technical terms of Sanskrit Buddhism find no place in the book.

The system of transliteration used in Professor Macdonell's dictionary is the one adopted by the late Professor Max Müller in his "Sacred Books of the East" and the Sanskrit word mahârâja, for instance, appears as mahârâga, with a cursive g. The system of representing the palatals by the symbols of the corresponding gutturals and marking the difference by using cursive characters has long ago been abandoned by practically all Orientalists and the fact that it is used in this re-issue will be regretted by most specialists as well as by many others. Professor Macdonell himself (p. VIII) admits, that this system is not commonly used at the present time, and its preservation in the present re-issue, which is a photographic one, is probably due to purely technical reasons.

A. VON STAEL-HOLSTEIN.

TIMOTHY RICHARD OF CHINA, By William E. Soothill: London, Seeley, Service & Co., 1924.

The sub-title of this laudatory work describes Dr. Richard as "seer, statesman, missionary and the most disinterested adviser the Chinese ever had." Having known and admired Dr. Richard for twenty-five years I could not imagine a description which would have been more distasteful to him. He would have preferred to have been called "A humble disciple of the Prince of Peace." In the Foreword Sir John Jordon expresses an opinion which will be endorsed by all who knew Dr. Richard. 'Very few foreigners make any impression upon the masses of China or leave any trace behind them. Dr. Richard is one of the rare exceptions. His Chinese name—Li, T'i-mo-t'ai—holds a secure place in the hearts of the Chinese people.'

J. C. F.

THE CHINA JOURNAL OF SCIENCE & ARTS

THE THREE RELIGIONS OF CHINA, By W. E. Soothill : Oxford University Press, Second Edition.

This book is composed of lectures first delivered at Oxford to students designated for mission work in China and later revised for general readers. There is nothing new in the viewpoint or presentation ; the lectures follow the usual interpretation of China's religions adopted by missionaries. They are kindly in spirit but it is the kindness of a superior toward those in less fortunate circumstances, and perhaps that is the only way in which a devout Christian can view other religions.

The chapter on Taoism is the least satisfactory of any in this book. It proceeds upon the assumption that Taoism as a religion developed from Laozius in the same way as Confucianism from Confucius and Buddhism from Gautama. It is necessary to remember, however, that there were three distinct stages in Taoism which may be described as the ethical proceeding from Laozius, the magical from Chang Tao-lin in the Han dynasty and the ecclesiastical from the scholars of the T'ang dynasty who wished to have an indigenous religion capable of competing with well organized Buddhism. Taoism is later than Buddhism in China and is so recognized in the terms Ju, Shih, Tao, which together constitute the Three Religions. In this term Taoism is mentioned last.

This book will serve as an introduction to those who know little or nothing about the religions of China, such as students in college, but it makes no contribution to what had been previously known.

J. C. F.

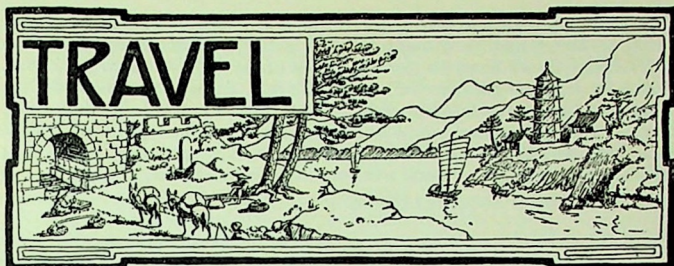
L'ART GRECO-BOUDDHIQUE DU GANDHARA, By A. Foucher : Tome II, Paris, 1922.

This second volume is composed chiefly of a resumé and conclusions. The resumé is meant to prove that the conventional figure of Buddha was produced under Greek influence in accordance with original ideas from India. Foucher suggests that some Indian Buddhist visited an Eurasian craftsman in his booth in the bazaar of Penkalaotis and enquired "Can you make me a Buddha" and receiving the answer "Why not" left an order for its execution. This is clever but can scarcely lay claim to being anything more. On such slender grounds rests the attempt to extend the influence of the Greeks to people whose native genius was sufficient to account in itself for all their art products. According to Foucher, the whole of Buddhist art whether in India, China or Japan has a western origin. It is a theory born of fantasy, not of fact.

J. C. F.

ANIMALS IN CHINESE ART, By d'Ardenne de Tizac. London 1922, Price £7.7.0.

This collection of animals has been made from art objects exhibited at the Cernuschi Museum in the spring of 1922. The figures have been



STAGES FROM CHONI TO SUNG PAN
AS MADE BY MR. AND MRS. HENRY C. EMORY,
SEPTEMBER, 1923.

Mr. Henry C. Emory, former manager of the North China branch of the Asia Banking Corporation, and one time professor of Political Economy, Yale University, together with Mrs. Emory, made a pleasure trip in 1923 through Western Kansu, being accompanied by Mr. F. R. Wulsin, the naturalist, from Peking by way of Pao Tou, the Ala-Shan District, Wang Yeh Fu (the present home of the Imperial Manchu clan), Ning Hsia, and Chung Wei to Lanchoufu, the capital of Kansu Province. Accompanied by Mr. and Mrs. George Findlay Andrews, they made a journey from Lanchoufu to Ti-tao, Choni, Old Tao Chou and through the Tibetan Grasslands to La Brang. From here Mr. and Mrs. Andrews returned to Lanchoufu, while Mr. and Mrs. Emory continued their journey, passing through Pao-nan, Shun Hua, Pa-yen-rung, Sining, the Kokonor, and so back by way of Sining and Mien-pei to Lanchoufu, thence they went to Choni, on to Sung Pan and out by way of Chengtu and Chunking down the Yangtze to Shanghai. The route taken between Choni and Sung Pan was practically new, only a portion of it having been previously covered by a foreigner, namely, General Periera. Mr. Emory died on February 6 on the "President Lincoln" on his way back to America and was buried at sea. The accompanying account of the journey made by Mr. and Mrs. Emory through Sung Pan should be of particular interest to our readers and to those interested in geography generally.

First Stage (80 li).

From Choni we proceeded 15 li down the T'ao River, running about S.E. to Po Yu, where is the residence of the Choni prince. Here the river turns for the moment to the east, and apparently the regular route to Ah Chüen is to go farther down to the juncture of the Ta Yu, or Ta Yi River, with the T'ao and up the Ta Yu Kou. We turned, however, to the

southeast, and cut across a very steep hill, going S.E. There was a temple on top, which they seemed to call T'o Ssu. This brought us into Ta Yü Kou (Ta Yi Kou) on the other side of the hill, in about $1\frac{1}{2}$ hours. From here it was a steady climb to Ah Chüen, through a winding valley, sometimes turning as much as S.W., but with the general direction from the foot of the above mentioned hill S. or S. by E. The stage usually given from Choni to Ah Chüen is 90 *li*, but with this cut-off over the hill it is probably about 80 *li*. It took pack-mules $9\frac{1}{2}$ hours of actual going.

The boiling point at Ah Chüen was 200° F.

Second Stage (25 li).

Made only 25 *li*, due to pouring rain and hard going. We started going S., but shortly after leaving Ah Chüen we left the main stream and headed S.E. Followed a very narrow path alternating between soft bog and difficult scrambles over high boulders. Mules took $4\frac{1}{2}$ hours to do 25 *li*, and on account of weather did not dare to tackle the big hill that day.

This secondary valley was merely called Hsiao Kou by the guides. Pitched tent on favourable slope surrounded by high mountains.

Third Stage (30 li).

Made only 30 *li* on account of late start and hard going. Proceeded S. about 10 *li*, through narrow gorge. Steady up-hill pull, with much fording of swift water. Apparently the direct route continued S., but guides feared to take it on account of danger to mules on narrow ledges through gorge. Consequently swung to the E. Difficult climb over a steep grass hill, and made a long semi-circular swing E., then S.E. then S. over high grass hills above tree line. Precipitous stone peaks above. Grassy slopes, often very steep and always boggy. Mules frequently sunk in and lost their footing, sometimes rolling down hill. Consequently long delays. After about 4 hours finished the crest of grass hills and came to deep gorge with stream at bottom flowing S. We judged that we were on the divide, and that this was Yangtze water. However, as we crossed two equally high passes on the two succeeding days, cannot be sure that this was the divide. Stream may have flowed S. and then N.E. to the Yellow River. The descent of the stream took about an hour, and the valley seemed to run at this point E. by S. Perhaps the course for the day averaged S.E., or even a little more easterly. Finding favourable camping place on reaching stream and not knowing what was ahead further down the gorge, camped at 3.30. Mule men pretty much exhausted with constant shifting of loads. Coming down from the grass hill passed through spruce growth into luxuriant birch growth.

The guide gave the name of this valley as Hsia Chia Kou.

Fourth Stage (60 li).

About 60 *li* or perhaps less. Course for day estimated between S. and S.S.W. For first half-hour course S.E., then turned at right angle, up valley running S.S.W. Called by guide Ta Ya Ya Kou. After another half-hour, stream again divided. Followed the right-hand (west),

STAGES FROM CHONI TO SUNG PAN

branch. Towering cliffs both sides. Soon streams divided again. We turned to the left, going S. by E. Then began steep climb up beyond the tree line to grass covered top with stone cliffs above. About half-an-hour over the mountain top in a southeasterly direction, then plunged at right angles through very difficult steep defile into what the guide called Yeh Chia Kou, S.W. or S.S.W. Long hard descent for two hours through a magnificent gorge, with wonderful jagged peak covered with snow looming up ahead, apparently at the bottom of the gorge. After asserting several times that this mountain had no name, the guide called it Kou Ma Shan. Possibly this was an inspiration of the moment to prevent further questioning. After going round the base of this mountain, which rose more than 3,000 feet above the gorge at the base, the path still continued downward. Camped on beautiful grass knoll at the juncture of the main stream with a stream from the N.W. Magnificent jagged peaks across the stream to the east. Towering crags behind us to the northwest. Guide gave this place the name Yu Wu Tai. It was impossible to tell whether he meant the actual spot or the general locality.

Boiling point 200° F.

Fifth Stage (60 li).

Sixty *li* to Ni Pa, our first village. Course S. and S. by W. Started at 8.30, but at once struck almost impassable path over first shoulder. Combination of difficult boulders and soft bog. No foothold for mules. Took from 8.30 to 12 to do 5 *li*, and at 12 o'clock came out suddenly on beautiful slope, from which we could see village of Shi La about 5 *li* to the S.E. We had expected to make that village as one stopping place. However, as it was a little off the main course, we turned up a steep mountain going south. Very steep climb for 3 hours, but no serious delays. Now struck new type of forest, apparently virgin growth. Spruce no longer apparent, but enormous firs, some estimated over 15-ft. in circumference and 150-ft. high; also big red and white birch. Ground thick with rotted wood and deep moss. Estimate climbed over 3,000 feet, then again across a grass shoulder above the tree line, with a very steep descent for two hours, down to same level, going about S.W. from the foot of the mountain, then about 15 *li* down an easily descending valley S.W. to Ni Pa.

Note.—In the itinerary given us at Choni by a man who had made this trip twenty years before, the second stage was given as Choni to Shi La 100 *li*. It would seem from the above that my estimate makes it nearer 120 *li*. We only sighted Shi La on the morning of our fifth stage (fourth stage from Ah Chüen). Our stages were very short, but I doubt if the stage could be made from Ah Chüen in any case in one day. Possibly with riding animals only and a long June day, with the ground dry—if it is ever dry there—it might be done. Pack animals certainly could not make it. Between Ah Chüen and Shi La are two enormous mountains, and I imagine always boggy at the top. We were told that there was a cave for shelter between Ah Chüen and Shi La, and we

passed this cave on the fourth stage as given above, about 15 *li*, just before making the steep climb to the grass covered top above the tree line. The cave, however, was small and very damp with the water dripping from the roof. It would offer some shelter to travellers proceeding rapidly without tents.

Sixth Stage (70 li).

Proceeding from Ni Pa (called by some of the local inhabitants Num P'a) 10 *li* going about S. by W. down the same valley, by a gentle descent, we came to Ma Ya Ao, called locally Ma Ya. At this point our stream joined with a good-sized swift river coming in from the northwest. This river was called the P'i Sui, or P'i Shui, and we were told that it was an important one, flowing into Szechuan. Shortly after leaving Ma Ya this river turned to the east, and I feel sure that it must flow from Southern Kansu into Northern Szechuan in an easterly direction and ultimately join the Chia Ling system.

In general I believe that all the rivers immediately south of the divide work eastward toward the Chia Ling system and so ultimately reach the Yangtze, through the Chia Ling, at Chungking. It is only after a further high range is crossed, more to the south, that one strikes the waters of the Min system, flowing through K'üan Hsien into the Yangtze at Sui Fu.

Thus P'i Shui, coming down from the N.W. flows through Ma Ya in a southerly direction for a short distance, where it is crossed by a substantial bridge. As already stated, it turns sharply to the east just below the village. This village of Ma Ya, located at such an important junction, with its evidently important bridge, seemed to be the most important geographical point for this whole region. There seemed to be a well marked road coming down from the N.W. along the big river. On inquiry we were told that this road went up to Dragama (Chinese Tra'-ka'-na) and so through the K'ach'in Kou to K'ach'in, and thence to T'ao Cho (Old City).

It seemed fairly evident therefore that Ma Ya was the junction of two separate routes over the Min Shan, one by the K'ach'in Pass to Dragama and one by the T'a Yi (T'a Yu), the route followed by us. Up to the time we reached Ma Ya we had found no trace, between that place and Ah Chüen, of a foreigner ever having been seen on the route. Also they knew nothing of Chinese or Moslem traders. There seemed to have been only a forest path for Tibetans. At Ma Ya, however, they reported having seen a foreigner with a lame leg about two years previously, who at Ma Ya had turned N.W. up the river and so to T'ao Chow through the K'ach'in Valley. This clearly referred to General Pereira, and from Ma Ya south we heard of him at every stopping place on our route to Sung Pan as the only foreigner who has been over that road. It, therefore, seems quite clear that our route between Ma Ya and Sung Pan (via Nan P'ing, as explained below) was the same as that taken by General Pereira in this northern trip from Szechuan to Kansu over the Min Shan.

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At Ma Ya he took the north-western passage, whereas we had come down over the eastern pass.

Ma Ya was also interesting as showing quite a different type of country. From Ni Pa down to Ma Ya for the first 10 *li* we were still in wooded country but had left the big conifers behind. On the other hand, oak, ash and willow were conspicuous together with some maple and many unknown trees. From Ma Ya on, however, the country became much bleaker, with bare hills to the east and the typical small spruce appearing again on the western slopes. Immediately on leaving the big river below Ma Ya, where our direction was S.S.E. up a small stream, the country became very barren and uninteresting. The course for the afternoon was perhaps S.E. on the average, over a narrow path, sometimes at stream level, sometimes high up on a precipitous bank. In all cases, however, the country was barren and desolate looking, as in a large part of Northern Kansu. There were frequent accidents to the loads, and in some cases the road had to be built up to enable a fallen mule to get back on the track. After continuous delays and a long pull up the valley in the dark, the course now being steadily S.E., we arrived, at 8 o'clock, at T'ai Li Sha. This is the name given to the village by the Chinese in Choni who made a tentative itinerary for us. Locally it seemed to be known as T'ai Ling Yu.

Seventh Stage (45 li).

We stayed at T'ai Ling Yu for one day, expecting a new escort, but despite some scouring of the country none could be found. It was not possible to buy eggs or a chicken, but after insistent demands on our part for a sheep one fatherly billy goat was produced late in the day. The next morning our guides agreed to go on with us to the next important village Yang Pu. It being a short stage we did not get under way until 11.30, making a gradual ascent up a valley called by the guides Teh Ku. Direction S.E. On this road we passed two picturesque Lamasaries, and saw the villages to which they belonged farther up the hillside on very picturesque locations. The villages and the Lamasaries seemed to have the same name. The first Lamasary was 20 *li* out, called La Ch'o Ssu. Ten *li* further on was a Lamasary evidently of the Bon sect, with pink and white perpendicular stripes to the walls, called Pu Ku Ssu. Just beyond here we came down to the level of the stream, which we crossed by a good bridge, and then left the main stream, up a stiff climb for an hour to Yang Pu, going E. Until making this turn the course for the day had been S.E. At Yang Pu we were welcomed by the headman of the village and found it a very picturesque spot at a high altitude. Boiling point 198½° F. At this point we saw two Totem poles, the first ones encountered on our route. They were crude and weather-beaten, but were carved in the conventional patterns. Here we were turned over to the new escort, under command of the village head-man, and said good-bye to the escort which had accompanied us from Choni.

(To be continued).

TIDAL BORES
MEDIEVAL AND BEFORE CHRIST

BY
G. T. MOULE

PART II
THE BORE BEFORE CHRIST

(Continued from page 441)

Let us now go back to a time fourteen centuries before the Topography, and hear the poet Mei Shêng (乘枚) on the Bore. And let us remember that he was writing fifty years before the birth of Julius Cæsar.

In part four of his article, after mentioning the first instance of *Ch'ao* (tide) known to him, which occurs in a poem by Ch'ü Yüan, about B.C. 300, "I listen to the boisterous crashing of the tides," A. C. Moule says:

"The next example of the word is from the *Ch'i fa* (七發) by Mei Shêng, about B.C. 150. The whole chapter is so relevant to our general subject that I have attempted a paraphrase of part of it."

(In Mr. Waley's book "*The Temple, etc.*," published last October, there is a rendering of part of the same passage. I shall quote partly from Waley and partly from A. C. Moule).

The famous poem the *Ch'i fa*, i.e., "seven incitements," or "seven efforts to rouse," consists of seven "*fu*." *Fu* was the name given to literary poetry as opposed to "song-words" or *libretti*.

Mr. Waley says:

"The distinguishing mark of the *fu* was that it was recited and not sung. . . . The *fu* was originally a *spell*. In its *first* and purely magical form, it is derived from the hymns by the recitation of which the priests of Ch'u (i.e., the 'Land of Thorns'—the Yang-tze valley before B.C. 1000) compelled the gods to descend from Heaven and manifest themselves. . . . In its *second* form it is an incantation addressed to an earthly god, the King, whom the poet—not by argument or rhetoric, but by a purely sensuous intoxication of rhythm and language—entices to a particular act of worship."

The *Ch'i-fa*'s seven *fu* are of this second form. It was probably addressed to the King of Wu. Briefly the 'argument' of the poem is as follows:

The Crown Prince of Ch'u was lying ill, suffering from *delirium tremens*. A Stranger from Wu came to see him, and promised to cure the Prince "by the speaking of certain magic words."

Then follow six *fu*, each of which describes one of the worldly pleasures formerly pursued by the Prince. At the end of each *fu* the Stranger asks him how he does, and he answers "I am too weak to rise." The first five *fu* describe *music*; *feasting*; *riding in a racing chariot*; *women*; and *hunting*, respectively. The sixth *fu* (which concerns us) describes the watching of a Bore. This is the *fu*, part of which my brother and Waley have translated, quite independently.

"The Stranger said: 'It is the full moon of the eighth moon. From far and wide the lords and barons have gathered together. You and all your brothers go with them to Kuang-ling to see the Bore on the river Ch'ü'" (or, as Mr. Waley renders the last eight words, "to watch the waves at the river-bend.")

"Now the river is in sight. You cannot see the shape of the waves, but only a vast and featureless expanse. But soon—oh marvellous, the waves! How they gallop, how they leap, how they crowd and race and foam!"

The last paragraph is Mr. Waley's version of part only of the passage. I now give A. C. Moule's paraphrase of this, and of some additional lines:

"When we reach the spot, before we see the Bore, itself, but have only seen the places where the strength of the water has come, it will be alarming enough to make us tremble when we see what it has ridden over, what it has rooted up, what it has thrown into confusion, what it has whirled round, what it has swept away. Though one may have knowledge and eloquence, yet he will not be able perfectly to tell the way that it comes,—troubled, confused, muttering, hurrying, seething and surging; confused and troubled, vast, unbridled, immensely deep and wide, a chaos unlimited; it hopes to seize the southern hills, it passes through to the eastern sea, it reaches up to the azure sky, it is confident that it will leap over the steep banks. It searches out everything in its flow unrestrained, and sinks back to rest in the birthplace of the sun; it is borne along in a turmoil and then falls back again, and no one may know where it stops; . . . it comes to Chu-ssü and passes on far, till within it is empty and weary and ever more slow; yet it is not dissolved but goes on till dawn, keeping a fresh heart, and holding itself firm.

"Then we cleanse and order our inmost heart, and purify our whole body . . . At such a sight as this, though one were bound and hampered by disease, yet it will straighten the crippled and make the lame walk, open blind eyes and give hearing to the deaf; . . . how much more may it cure the scarcely discernible insignificant trouble of a disciple of those who are lovers of strong drink and too much addicted to wine . . ."

(Mr. Waley's version of the last two sentences is:

"At such a sight as this even bent limbs would straighten and stiff joints bend, the lame would walk, the blind see, and the deaf hear. How much the more can such a sight dispel the vapours of a heavy drinker, the fretful fevers of a profligate!")

"The Prince said: 'It may well be so. But tell me, what is the force that drives the wave?'"

"The Stranger answered: 'It is not recorded. But I have heard that there are three things (in it) which are like God, but are not God: first, that the loud thunder of it is heard a hundred *li* away; the second is that the river water flows backward and the sea water hastens upward; the third is that like the mountains it sends forth clouds day and night without ceasing.* The water overflows and spreads abroad and rushes on, the waves surge to and fro, and the Bore begins. At the first beginning the flood breaks here and there into foam, like white cranes alighting'; (the front of the Bore has at first a smooth surface, which breaks down for a moment here and there into foam: "like white cranes alighting" probably refers to this feature) 'as it draws a little nearer it grows larger and larger, whiter and whiter, like the curtains and covers of white chariots with white horses, waves boiling and clouds whirling, all lashed up into foam, like the mighty charge of three regiments of soldiers . . . This is the strangest, rarest, most wonderful sight in the world. Can the Prince make the effort to rise and look upon this?' The Prince said: 'Your servant is ill and not yet able to do so.'"

In the seventh *fu*, the Stranger describes the pleasures of erudition (heavenly wisdom); and at the close the Prince is cured ("suddenly he was ill no more").

It is comforting to see how little the 'spirit of man' has changed through the ages, in spite of all that our optimists and pessimists tell us of evolution upward, or reversion downward. After copying the above passage, I read a magazine story by one of the British 'best-sellers,' in which the hero (who is praising a powerful and pernicious preparation called Peppo) says to the lady who is to be his aunt-in-law:

"This is what you want! two doses of Peppo, and cripples throw away their crutches and join the Beauty Chorus."

Twenty-one centuries before this, Mei-Shêng's hero, praising the curative effects of seeing the Bore, says to the sick Prince:

"At such a sight as this . . . the lame walk, the blind see, and the deaf hear."

Though it grieves me greatly, I must not conceal from you that the Bore described by Mei Shêng was *perhaps* not our Bore.

Mr. Waley says that Kuang-ling was near Yang-chow, and that the river was the Yang-tze: and Yü Ssü-ch'ien in his "*Treatise on the Tides*," written in 1781, argues that Mei-shêng's Bore was on the stream between Kua-chou (opposite Chinkiang) and Yang-chow. I know this stream well (better than almost any place in China), and it would surprise me more to see a Bore there than on the West Lake here!

* (N.B.—There is some uncertainty about the "three points": A. C. Moule here follows the commentary. Waley translates them differently; and A. C. Moule says the three points may be, 1. Thunder, 2. The Bore, 3. Mountain Clouds.)

A. C. Moule's note on the subject is :

" Mei Shêng was a native of Huai-yin in what is now northern Kiangsu, and Kuang-ling was a kingdom a little farther south, but north of the Yang-tze. *Ch'ü* (winding) is a name which has been applied to the Ch'ien-t'ang river, but there seems also to have been a river *Ch'ü* in northern Kiangsu. . . . I find it hard to believe that Mei Shêng would use place-names familiar round his home to refer to our region two hundred miles away, where those names find no place in the geography of the time." So far the learned modernists.

Personally I am a fundamentalist of the fundamentalists in what concerns the "*local situation*"—in Ibsen's sense; and am content to follow the various old Topographies which state that Mei Shêng refers to the Bore which now runs up our river. We cannot, of course, say that it was *then* the Hangchow Bore, for our city was not founded until seven centuries after Mei Shêng's time. Where we are now sitting was probably then under water—river—or sea-water. Yet I venture to think that it was *our* Bore that the poet describes. As recently as A.D. 1 (*i.e.*, one hundred and fifty years *after* Mei Shêng's poem), it is alleged that two of the three branches which the Yang-tze river then possessed discharged their mud and water into what is now the Hangchow Bay. (See Yule's "Marco Polo," 3rd edition, vol. II, p. 199; and map facing p. 144.) It seems possible that our Bore—in its youthful days—entered one of these southern mouths of the Yang-tze, and that it was on one of these estuaries that Mei Shêng saw the Bore—"the strangest, rarest, most wonderful sight in the world," as he called it.

In conclusion, I will quote the words in which A. C. Moule modestly sums up his article :

"At worst, perhaps, a few interesting quotations about the tides in general and the Bore in particular have been brought together, showing that in the second century B.C. a good Bore was expected at full moon, and that the dependence of the tides upon the moon was clearly stated in A.D. 82; while by the middle ages a theory of the tides had been developed which was in advance of anything that seems to have been known at that time in Europe."

Those who read the original article will find in it, I think, much more than this.

TRAVEL AND EXPLORATION NOTES

THE MYSTERY RIVERS OF TIBET.—By Captain Kingdon Ward,
Seeley Service & Co., London.

This book deals with that fascinating region, which the author has made peculiarly his own, the borderlands of North Western Yunnan, Western Szechuan, Upper Burma, and South Eastern Tibet, where four great rivers plough their parallel courses southwards from the highlands of Tibet through deep gorges divided off from one another by huge mountain ranges whose lower slopes are covered with primeval forests and whose summits are clad with eternal snows. The author is one of a select band of botanical travellers who have spent long years exploring the plant life of this wonderful region, which is peculiarly rich in interesting flowers, shrubs, and trees, and which can scarcely be surpassed anywhere in the world for beauty of scenery and difficulty of travel. The particular journeys he now describes, on the Yangtze-Mekong and Mekong-Salween watershed ranges in the vicinity of Atuntze in N. W. Yunnan, were undertaken in 1913 and 14, and he has both before and since paid other prolonged visits to the neighbouring regions of Yunnanese and Szechuanese Tibet; while at the time of writing he is, it is understood, actually engaged in exploring even more unknown parts in the heart of South Eastern Tibet itself, the Mecca of so many travellers from the days of Gill and Cooper to those of Davies, Bacot, and the rest.

Captain Kingdon Ward writes, therefore, as a master of his subject, and where his book deals with the plant life and natural features of this out of the way corner of the earth it is of great interest, and value and the only complaint the reviewer has to make is that he is not told more about the trees and flowers, and especially the animals, of this little known region. For the first half of the book the reader accompanies the author over the great snow-clad mountain masses on each side of the Mekong on the latitude of Atuntze, and later descends with him into the valley of the Salween, where, however, the travellers peregrinations, in the vain attempt to cross over into Assam or Upper Burma, become a trifle wearisome to read about. The political troubles of the period, 1913-14, when the Chinese of Szechuan and Yunnan were making a half-hearted attempt to recover the position in Tibet which they had lost as the result of the revolution of 1911 and the murder by the revolutionaries of the last of China's great Empire Builders, Chao Erh-feng, prevented our indefatigable explorer from carrying out his plans, but the traveller who has recently visited the Atuntze and Batang neighbourhood will note with feelings of envy the absence of all reference to brigandage, that curse of modern China.

Captain Kingdon Ward writes well and has much of interest to tell about the discoveries and adventures of the plant hunter, and what more fascinating occupation can there be for those blessed—or should one say afflicted—with the *wanderlust* and the call of the wild; but his incursions

into the political and other fields are not always so happy. Thus, while entirely endorsing all that Captain Kingdon Ward says about the high state of civilization and superior standard of living of the agricultural Kambawa (the people of Kam or Eastern Tibet), the reviewer cannot agree with his explanation of the reasons for this culture, namely that it is due to the system of slavery prevalent in the Salween Valley and the advantages of leisure conferred on the slave-owners thereby. Perhaps the author, having only visited the extreme South of Tsawarong (a province of Kam), has erroneously applied, in this and other instances, the conclusions drawn from what he saw there to the whole country; for as a matter of fact slavery of this kind is not at all prevalent amongst the Tibetans of Kam Proper, which extends from the borders of Yunnan and Burma in the South to those of the Kokonor in the North; and the civilization and culture of the Kambawa, centering in the great monasteries in Chamdo, Tsawarong, Dege, Markam, and Draya, must be ascribed to the history and qualities of the people themselves, who represent perhaps the most highly developed portion of the Tibetan race, and who would doubtless have attracted far more attention from the world in general were it not for the fact that they inhabit one of the most inaccessible parts of the surface of the globe. The libraries of the monasteries, more particularly those of Dege Gonchen, the printing presses of which are famous all over lamaistic High Asia, present a virgin field to the student of Tibetan history and religion which will perhaps one day be found worthy of investigation.

The last chapter, on the geography of the three great rivers of Eastern Tibet, is interestingly suggestive, and we look to Captain Kingdon Ward to reveal at some future date the mysteries of the Upper Salween above Menkong, only small portions of which have so far been visited by foreign travellers, including the late General Pereira and Mr. L. M. King.

The book is well got up and illustrated by excellent photographs of the wonderful mountain scenery and racial types (mostly frontier tribesmen rather than Tibetans) found in this remote corner of Asia, but the absence of a proper route map is to be regretted. The spelling of the place names, whether Chinese or Tibetan, is excellent and a contrast to that found in so many books of travel, the authors of which are apt to write down what they hear with often disastrous results to their maps, instead, as is done in the case of this book, of reproducing the recognized romanized form of the Chinese characters or transliterating the Tibetan words from their proper Tibetan spelling.

No book about the back blocks of N. W. Yunnan is likely to be complete without some reference to another botanical traveller, Mr. George Forrest, who has been working these regions for something like twenty years past, and who finds frequent and honourable mention in these pages. Like Captain Kingdon Ward, Mr. Forrest cannot, it seems, be kept for long from the forests and snows of these borderlands, and he too is, it is understood, once again in the field, busy enriching the botanical gardens of England with the floral wonders of S. W. China.

E. T.



SAVE THE BIRDS OF CHINA

BY

C. R. KELLOGG.

Everyone likes birds. From time immemorial they have been admired by all peoples for their cheerful songs, bright ways, and beautiful colours, but very few people realize what valuable aid they render to man. Cases of stuffed birds in museums always draw their crowds; live birds in the zoological gardens attract many admirers, and numberless birds are kept in cages in our homes, but ordinarily little attention is paid to their economic importance and it is the object of this paper to point out how invaluable they are, and, if possible, to arouse more interest in their study and protection.

In order to find out what birds eat we must study them in their native haunts, observe their food habits, and make careful records of their constituents. This method will afford the bird student a great deal of pleasure and satisfaction, but it is unfortunately not always the most efficient way of determining what goes to make up their food.

Another method, which is much more exact and accurate is to shoot the birds and determine their stomach contents. Needless to say, such a method should never be undertaken except by a few expert ornithologists, and then only as a last resort. Although this seems to a bird lover a most cruel way of learning the facts, it has given us a large amount of very accurate information that could have been secured in no other way. Furthermore, it has often been a blessing to the birds, as it has proved the innocence of many species suspected of doing harm and has shown the fallacy of relying on popular opinion, or even popular observation, for our appraisal of any particular species of bird. Although no such studies have as yet been made in China, examinations of many bird stomachs in America have been recorded, and the information there obtained will be of value to us in China, as many of our birds have much the same food habits.

Critical examinations of the stomachs of certain American woodpeckers showed that 76 per cent. of their food consists of the larvæ of certain beetles which bore into the wood of living trees and cause their death

SAVE THE BIRDS OF CHINA

in a few years. It was estimated that one woodpecker would eat as many as 50 larvæ in a day, and at this rate, a single bird might easily destroy some 18,000 insects in one year. When we realize that in America alone forest insects, in spite of this check, yearly destroy \$400,000,000 gold worth of timber, and that the woodpeckers are practically the only birds able to dig out of the trees and destroy these insects, the importance of the woodpeckers is at once evident.

Some people in China are superstitious about the night-hawk or night-jar, but it is really one of our best allies. Its food consists largely of flying ants, termites, and even mosquitoes, and because of its greediness it is capable of destroying large numbers of these pests. From 200 to 1,800 ants have been found in a single stomach, and in 87 stomachs examined there were a total of 20,000 ants.

Anyone who is at all observant, will often have seen birds that are perched up on telegraph wires or high branches of trees suddenly leave their perch and dart out into the air, returning to the same place immediately. These birds are flycatchers, and the dart was made to capture a tiny flying insect, too small for our eyes to mark, for these expert fliers are too sportsmanlike to capture a sitting insect. Ninety per cent. of their food consists of harmful insects and if they could be protected and encouraged, they would be among the most valuable bird policemen we could have.

Even the sparrows, whose food usually consists largely of seeds, feed partly on insects, and in some cases as much as 62 per cent. to 95 per cent. of their food is animal, thus justifying our including some of them at least among the helpful species of birds. The common tree sparrow (*Passer montanus*) is everywhere an unmitigated nuisance and does not merit any protection.

All are familiar with the tiny titmouse, whose cheery notes and active movements brighten many a dull winter day. Examinations of our American titmice have shown that during the winter one-half the stomach contents comprise tent caterpillars and fall webworms, two of the most destructive shade-tree pests in America. Furthermore, the eggs of the aphids make up about one-fifth of their winter food, giving to each bird a daily average of 450 aphid eggs. One stomach examined showed 5,500 such eggs eaten at one meal. When we stop to consider that the progeny of one pair of aphids could produce enough offspring in one summer, if all were allowed to live and reproduce unchecked, to outweigh all the people of China, the importance of the work of the titmouse is very apparent, for one egg in the winter may mean hundreds of thousands of new aphids the following summer.

The swallow has been deservedly considered by the Chinese farmers, as well as those of other countries, to bring good luck, for 99 per cent. of its food consists of insects, mostly mosquitoes and gnats all of which are caught on the wing. As these tireless servants of man ceaselessly skim about during the long summer days hosts of these tiny insect pests must fall prey to their rapacious appetite.

Because it takes a little waste grain once in a while, the mourning dove is usually considered harmful by most of the Chinese farmers,

but such a notion is not borne out by a careful examination of the stomach contents of its American relations. Some 257 stomachs were examined and in all of them the food consisted of 99 per cent. vegetable matter, for the most part weed seeds. One stomach contained 7,500 seeds, another 6,400, and a third 9,200, practically all seeds of harmful weeds. The good the birds do in eating so many weed seeds is so great that if they do occasionally take some waste grain such reward for their services should not be grudgingly given.

Morally the cuckoo is considered to be outside the pale of good society because of its habit of laying its eggs in the nests of smaller birds and compelling them to rear its young at the expense of their own offspring, but economically its value to man is very high. Its great worth is due to the fact that it will eat the woolly caterpillars and offensive stink bugs—insects which no other birds will eat. In one stomach of a cuckoo were found 250 tent caterpillars and 217 fall webworms, both very injurious pests.

For some reason people consider all birds of prey as harmful and attempt to kill them whenever they appear. As a matter of fact, however, a critical study of these birds in America, where they are especially abundant, shows only two or three species to be harmful, and all the others decidedly useful. The hatred of hawks and owls is due to ignorance, as, with one or two exceptions, they are among the best friends the farmer has. All day long the hawks patrol the fields capturing field mice, rats, rabbits, and other creatures that harm the crops, and all night the owls render the same service, and their reward is to be shot at every time they appear. To believe, just because one or two species are harmful, that all hawks and owls are injurious, is just as logical as to conclude that all men in a village are evil just because it harbours one or two desperate characters. A few of the birds of prey are harmful, but the majority merit out protection.

Unless special attention is paid to the matter very few people realize how much good the birds are actually doing nor how many insects they are capable of destroying. Not long ago we were watching a swallow feed her young and by actual timing with a watch she was seen to bring back an insect every three minutes. At this rate it is easy to figure that in a long summer's day of ten hours she would easily destroy 200 insects, mostly mosquitoes and gnats. A bird student in America once saw a marsh wren carry to its nest 30 locusts in one hour. At this rate one nest would consume 210 locusts per day. Allowing twenty nests to every mile, it was estimated that in that one state alone (Nebraska) the marsh wrens alone would destroy 162,771,000 locusts per day. One locust weighs one grain and each day it would consume at least its own weight in leaves of the crops growing there. Figuring the value of the crops at \$10,000 gold per ton (which is very low), the amount of damage done by so many locusts in one day would be \$1,743.25 gold. In other words, the amount of money actually saved to that state in one day by the birds is \$1,745.26 gold. Another bird student in a neighbouring state estimated that if all the birds should be suddenly killed, the insects would increase to such an extent that in seven years there would be one insect

SAVE THE BIRDS OF CHINA

on every square inch of soil in the entire state. In America, where very careful study of the subject has been made, it has been found that over \$800,000,000 gold worth of damage is done yearly by insect pests. In China no such studies have been made, but it is safe to state that at least one-tenth of the crops are destroyed every year by insects, amounting to many hundred million dollars annually. Surely a bird is more active and can destroy more insects than a toad, yet an American investigator has found that the common toad is actually worth 18.99 gold a year, because of the cutworms and other injurious insects which it destroys.

Perhaps we think that because there seem to be so many birds there is no danger of their disappearance, but the story of the passenger pigeon in America will illustrate how swift and complete may be the extermination of a species by man. About sixty years ago these birds were so numerous in America that as they flew over the land the flock would darken the sky like a great cloud, but to-day they have so completely disappeared that an offer of \$3,000 gold for just one nesting pair has never been claimed.

In Japan and Italy the birds have been so ruthlessly killed and persecuted that they are very scarce and these countries are so afflicted with insect scourges that they would gladly have the birds back again, but it is too late.

China is still blessed with an abundance of birds and they should be protected at once or it will be too late to save them. When we note the rate at which guns are coming into China, and how many of the young men are keen on shooting, showing no discrimination as to the kinds of birds killed, we may well view the future of agriculture with alarm, for as the birds decrease, the insects are sure to increase. As one bird student has said, "Any country which allows its birds to be shot ought to be eaten alive by insects," and he might have added that such a punishment would follow as surely as night follows the day.

Laws should immediately be put into effect licensing all owners of guns, foreign and Chinese, and permitting the shooting of birds, other than game birds, only under very rigid restrictions. But laws without public conscience back of them will be of little avail, and through our schools and popular demonstrations and lectures, love and protection of birds should be taught. If the youth of the land are taught the value of the birds there would be no desire on their part to destroy such valuable servants and in this way education, better than any other means, can be used to save the birds of China.

We would earnestly recommend that more attention be paid to this subject in the schools and an interest in the protection of our birds be aroused. In pursuance of this object let us, then, as they do in other lands, designate a special day in the Spring (May the 4th is thus observed in America) for the special consideration of birds and bird study, and urge that on that day in every school in China, the study of the economic importance of birds be observed with appropriate exercises.

LIFE ZONES AND TEMPERATURE CONDITIONS IN SHANTUNG

BY

ARTHUR PAUL JACOT

Having collected and studied the Littoral Marine Mollusca of the province, the writer was struck by the resemblance, even in detail, of this portion of the fauna to the corresponding fauna of the coast of North Carolina, U. S. A.; and since there was no other group of animals or plants which could be used to throw further light on the correlation of the life zones of this province with those of North America, a study of temperature conditions as a basis for this correlation was resorted to.

The records used are in part as follows:

For Peking: Dr. H. Fritsche, "Climate of Eastern Asia," Journal of the North China Branch of the Royal Asiatic Society, vol. 12 (1878), pp. 127-335, 18 charts.

For Shanghai (Zi-ka-wei): J. de Moidrey, "Reductions des Observations de Température 1873-1903," Imprimerie de la Mission Catholique, Zi-ka-wei, Shanghai, 1905, 57 pp., 2 charts.

For other localities: H. Gauthier, "La Temperature en Chine," Impr. de la Mission Catholique, Zi-ka-wei, Shanghai, 1918, pp. 794; Annual Report of the Tsingtau Meteorological Observatory for the year 1919; and for the year 1920.

The location of the stations chosen is as follows:

Hienhien is southwest of Tientsin on the Shantung-Chihli (Chi-tung) plain, and far enough from the gulf not to be influenced by proximity to this body of water. The latitude is 38.21. It is slightly farther west than Peking in longitude. The reports cover the years 1877-1888 (12 years).

Tamingfu is west of Tsinan and slightly south, in the toe of Chihli. It is therefore also in the Chitung plain. The records include the years 1908-1911 only. The latitude is 36.18.

Shanghai: the Zi-ka-wei records have been used. The observatory is situated in the southwest suburb.

The method is based chiefly on Livingston and Shreve's "Distribution of Vegetation in the United States as Related to Climatic Conditions, Carnegie Publication 284. No attempt has been made to work out the physiological indices discussed in this work, as the conclusion of the authors is that the resulting data is similar to that obtained from the remainder indices, etc. This is especially true for the securing of correlative data.

The data secured and the method of securing it is as follows:

(1) Average Temperature for the *Fourteen Coldest Days*: From a table showing the average of the daily means for the number of years recorded, the fourteen coldest days are chosen. If this period of fourteen

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days is too short to include the two coldest spells the period is extended to include as many days as necessary. The average of these mean averages is then calculated.

(2) Average Temperature for the *Six Hottest Weeks* : The same method is here pursued as in the above.

(3) Number of Days with *Temperature of 68° F. (20.2°C) or above*. This refers to the mean daily temperature.

(4) Annual Mean Temperature ; Used as found in Annual Reports.

(5) *Sum of Average of Mean Daily Temperatures* for the Average Frostless Season : The data for determining the average frostless season is usually lacking except in the most detailed weather reports. This season is secured by determining the earliest day in the fall and the last day of spring which has frost, for each year of observation and then securing the average date. The sum is then secured of the average mean daily temperature (for the number of years recorded) for the days within this period.

Although this data was securable for Peking and Zi-ka-wei only, it includes the Shantung area. The Peking dates March 28 to November 1 (217 days) is *fide* Fritsche and amounts to 436°C. The same data for Zi-ka-wei taken from the report of Moidrey is March 19 to November 7 (232 days) and amounts to 4721°C. In these summations both dates are included. To compare with the data given by Livingston and Shreve, these sums are reduced to Fahrenheit Peking 7893°, Zi-ka-wei 8496°. The following localities in the United States fall within these figures :

Evansville, Indiana ..	7,700	Nashville, Tenn ..	8,331
St. Louis, Missouri ..	7,771	Charlotte, N. Car. ..	8,276
Roswell, New Mexico ..	7,824	Oklahoma, Okl. ..	8,289
Cairo, Illinois ..	7,966	Norfolk, Virginia ..	8,331
Chattanooga, Tenn. ..	7,978	San Jose, Cal. ..	8,337
Richmond, Virginia ..	8,062	Anniston, Alabama ..	8,450
Raleigh, N. Carolina ..	8,069	Atlanta, Georgia ..	8,531

Of these, the majority fall in the Upper Carolinian life zone, usually near its southern edge, while three fall near the northern edge of the Lower Carolinian life zone. It is not, however, those localities falling closest to the Zi-ka-wei sum which fall into the Lower Carolinian or near it. This therefore places Shanghai in the Upper Carolinian life zone though near its southern border as also the plain to the northward, while Peking falls near the centre of the same zone. Shantung, lying as it does, between these two points, falls unquestionably within the Upper Carolinian life zone.

Having often heard it said that Peking was about two weeks behind Tsinan in its season, the writer made a trip to the capital from Tsinan during the first week of April, and observations made on the condition of the vegetation along the route and at both points. Peking and the Tientsin area as far south as Tsang Chou was found to be about two weeks behind Tsinan. For instance, in Tsinan *Capsella bursa-pastoris* blooms on or about March 16 (as this year). In Peking I saw none in bloom by April 4. In Tsinan the willows bloom about the twenty-second of March, while in Peking

they were only beginning to bloom on April 7. Other plants like *Marrubium incisum*, *Sisymbrium sophia*, *Astragalus scaberrimus*, the *Guldenstaedias* and *Taraxacum officinale* were blooming on April 2 in Tsinan. On April 8 they were coming through the ground about the Peking-Tientsin area. It was not until we had come near Techou that we found the flora decidedly more advanced. Thus Tsinan and even the whole of western Shantung is at least a week and a half, one may well say two weeks, in advance of the Peking-Tientsin region. This condition is undoubtedly non-existent during the summer rainy season.

Another trip taken April 19 to the region lying half way between Tsinan and Techow, revealed the fact that the vegetation of that region (Chang Chuang) was one week behind that of Tsinan, though only sixty miles to the northwest. This difference cannot, however, be attributed to temperature but to precipitation conditions.

There are additional temperature data to be presented on this subject. The remainder of the indices may be best presented in tabular form (Table I) where the first figure is the centigrade reading and the second one (in parentheses) the Fahrenheit.

Locality and Latitude	Peking	Hienhien	Tamingfu	Tsingtao	Zikawei (Shanghai)
		38.21	36.18	36.04	31.12
Fourteen coldest days	Dec. 29- Jan. 17 -4.8 (23.3)	Jan. 6- Feb. 5 -4.6 (23.6)	Jan. 9- Jan. 24 -3.1 (26)	Jan. 25- Feb. 6 -1.4 (28.9)	Jan. 17- Feb. 3 2.6 (36.7)
Six hottest weeks	July 1- Aug. 14 26.2 (79)	July 3- Aug. 17 27.9 (82.5)	July 3- Aug. 17 28.8 (83.5)	July 24- Aug. 29 24.9 (76.8)	July 10- Aug. 19 27.3 (81.0)
Mean daily temp. above freezing	4583 (8049)	4823 (8681)	5085 (9153)	4374 (7875)	5472 (9849)
Annual Mean Temp.	11.8 (53.2)	13.0 (55.3)	13.9 (56.8)	12.2 (53.9)	14.9 (58.8)
No. days with temp. of 20.2°C. or more.	May 16- Sept. 12 120 days	May 13- Sept. 22 132 days	May 14- Sept. 23 132 days	May 16- Sept. 12 119 days	May 25- Sept. 30 129 days

Comparing the data for the fourteen coldest days with the corresponding figures for the United States, as given by Livingston and Shreve, we find the records for the following cities to be similar to our figures for Peking :-

Chicago, Ill	..	..	23	Boston, Mass	..	..	26
Detroit, Mich	..	..	23	Kansas City, Mo	..	..	26
Keokuk, Iowa	..	..	23	Columbia, Mo	..	..	27
Grand Rapids, Mich	..	..	23	New Haven, Conn.	..	..	27
Buffalo, N. Y.	..	..	23	Providence, Rhod. Id.	..	..	27
Rochester, N. Y.	..	..	23	Utah	..	..	27-28
Ithaca, N. Y.	..	..	24	Columbus, Ohio	..	..	28
Scranton, Pa.	..	..	24	Indianapolis, Ind.	..	..	28
Cheyenne, Wyoming	..	..	25	Santa Fe, New Mexico	..	..	28
Hartford, Conn.	..	..	25	Boise, Idaho	..	..	29
Cleveland, Ohio	..	..	26				

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The majority of these cities are in the upper part of Merriam's Upper Carolinian zone. Those averaging 23° are usually at the very northern limit of this zone, while a few which are of higher temperatures, and evidently errors, are in the Transitional zone. Thus the winters for the Peking region are unusually cold compared with the data on the sum of the average mean daily temperature for the average frostless season. This is brought out in another way by Fritsche.

The cities corresponding most nearly to the Shanghai temperature, i.e., 36.7°, are :

Cairo, Illinois	35	Richmond Virginia ..	38
Ashville, N. Carolina ..	35	Nashville, Tenn. ..	38
Port Crescent, Wash. ..	36	Fort Smith, Arkansas ..	38
Lynchburg, Virginia ..	36	Roswell, New Mexico ..	39
Knoxville, Tenn. ..	37	Portland, Oregon ..	39
Tacoma, Wash.	38	Seattle, Washington ..	39

According to Merriam's map, these cities are distributed in the Transitional to the Lower Carolinian zone though mostly in the Upper Carolinian. According to a combination of Livingston and Shreve's chart (plate 43) and Merriam's map, Shanghai would be placed at the lower edge of the Upper Carolinian life zone.

This data would therefore place the entire region in the Upper Carolinian life zone which likewise concurs with Schimper (Plant Geography) who draws the line between the warm temperate belt and the cold temperate belt at the isotherm of 6°C. for the coldest month. In contrast with this, Schimper's statement, "we should exclude from the belt having a mild winter (warm temperate zone) districts north of 20°C. isotherm in July," would tend to place the entire Chitung plain in the northern edge of the Warm Temperate (Lower Carolinian) life zone.

The average of the mean daily temperature for the six hottest weeks, compared with Livingston and Shreve's map of plate 44, places the entire Chitung plain in what corresponds to the lower edge of Merriam's Upper Carolinian. No specific comparative data is presented.

It will be noticed that Shanghai averages cooler than the localities on the Chitung plain (except Peking). This may be due to its greater proximity to the sea and to its situation on a land mass bulging into the open sea (not an inland gulf).

For the number of days with temperature of 68°F. (20° 2C.) or above, Peking has 120 days, while Hienhien a few miles to the south has 132. This discrepancy may be due to differences of calculation. Again, Shanghai has fewer hot days than the cities of the Chitung plain. These figures may be compared with the following from the United States :—

Topeka, Kansas	118	Knoxville, Tenn. ..	128
Baltimore, Md.	118	Cape Henry, Va. ..	128
Cincinnati, Ohio	121	Evansville, Ind. ..	129
Lynchburg, Virginia ..	121	Cairo, Illinois ..	132
St. Louis, Missouri ..	127	Norfolk, Virginia ..	132
Louisville, Kentucky ..	128	Richmond, Virginia ..	133

Cities with a 118 to 128 day period are decidedly in the Upper Carolinian zone. Those with 129 to 132 day period are on the border line between the Upper and Lower Carolinian life zones. This means that according to this data, Tsingtao and Peking are Upper Carolinian while the region of Tamingfu southward borders on the Lower Carolinian.

Livingston and Shreve in their "Conclusions from the Study of Temperate Conditions" write, "Probably the most generally useful of our charts of the temperate conditions is the one for the length of the period of the average frostless season!" They present a table which records the limits of the various provinces. For their Medium zone which is Schimper's Cold Temperate and Merriam's Upper Carolinian, 180 to 240 days are given as the frostless season. The Peking season being 217 days and the Shanghai season being 232 days, it is again evident that the area under consideration falls into the Cold Temperate life zone. Furthermore, ten years of weather records taken at Weihien which are in manuscript form at the Shantung Christian University, give the average frostless season for that locality as April 3 to November 12 or 223 days.

Our conclusions, therefore, are that the available data would place Shantung and the Chitung plain in general, in the southern portion of the Upper Carolinian or Cold Temperate life zone.

This generalization is, however, modified by local conditions. Referring again to the table of temperature values, it will be noticed that the temperature conditions of Tsingtao are markedly different from those further inland in this particular: that Tsingtao is cooler in summer and warmer in winter. A study of the temperature records of other points on the Shantung coast, as Chefoo, the northwest promontory, etc. still further bear out this generalization. This is in agreement with the general rule that proximity to the sea increasingly modifies temperature conditions while remoteness from the sea (or large bodies of water) increases extremes of temperature. Thus it will be noticed that Hienhien, which is further inland, and even more Tamingfu, which is still further inland, are respectively hotter in the summer, and slightly colder in the winter. Thus the isotherms would run parallel with the coast line, forming a lake of more extreme temperature condition in western Shantung. This amount of east-west intra-provincial difference of temperature, although probably greater than the north-south difference, is not great enough to place the east or west end of the province in a different life zone. There may be, however, a strip of the Lower Carolinian (Warm Temperate) zone between Shantung and the Honan mountain mass, running northward close to this mountain mass. Unfortunately, sufficient data and the limits of this review, demand deference of any verification of this inference.

Although Shantung, as a province, lies entirely within the cold temperate zone, some of its points, as the tops of the higher mountains rise to a height which may place them in what is referred to in the United States as the Transitional life zone. As, however, there are no weather records for these mountain tops, and as there is insufficient detailed knowledge of the flora and fauna of China generally, one is not able at present, definitely to place them in one zone or the other. The striking difference

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in the flora of the top of Tai Shan, for instance may be due to increased moisture conditions and to a greater degree of shade, as found among the rock masses and cliffs of the north side. The general type of change, however, is great enough to be at least tentatively considered as due to low enough temperatures to place this mountain top, and possibly also a very few others, in the Transitional zone.

Finally, a word should be said concerning the use of the terms instituted by Merriam. Although at present strongly established in the United States, there is a tendency, as evidenced by Livingston and Shreve, to abolish them in preference to the more generally descriptive terms used by Schimper. The attitude of workers in China should certainly be in this same direction. If it should be found necessary to further subdivide the cold temperate, the two sub-divisions may well be referred to as Upper and Lower Cold Temperate, and the same rule followed for the other zones. It is questionable, however, if anything would be gained by such further subdivision. A tendency has even been manifested in the United States to abolish the Transitional life zone as a distinct zone and to regard it as a transitional belt included in the Cold Temperate, the position being taken that there is a more or less clearly defined transitional belt between all such zones, its extent depending largely on the character of the terrain.

MIGRATION NOTES¹⁶

BY

G. D. WILDER

CORRECTIONS

The last number of the magazine, and even the one preceding that, ought to have had some corrections of mistakes that occurred in these notes of preceding numbers. I am sorry to have to acknowledge. But when writing, I was absent from my file of the magazine, and preferred to let the matter go until I could make the corrections for all the issues of the year at once. In this number adjoining this article a list of Errata will be found, but I wish to make a few explanations here. In the July number, page 350, at the top, the name *sinensis* is suggested for the varietal form of the house martin which seems to prevail amongst those breeding in this province. Instead of *sinensis* our "List of Chihli Birds" has adopted *minor* as more descriptive of the variety, if, indeed, it proves to hold good.[†]

The paragraph immediately following refers to a tern that seemed to be Nordmann's *Sterna longipennis* but differed from the descriptions in some particulars. We now have several specimens both of Nordmann's and of this one, and find that the differences are generic. It belongs to the genus *Gelochelidon*, gull-billed terns, having a very deep bill, the tarsus somewhat longer than the middle toe and nail, and with the tail less than half the length of the wing. It seemed to be *Gelochelidon nilotica addenda*, Matthews, but that is not recognized as a palaearctic species, while *G. n. nilotica* is given as occurring through Persia and east to South-Mongolia, so that it should probably be referred to this variety.

Mr. La Touche in a letter kindly calls my attention to the fact that *Pygipicus pygmaeus semicoronatus* (Licht) referred to in the May number, page 239, as the common pygmy woodpecker, is an Indian bird occurring in Darjeeling, Manipur, etc., while our pygmy woodpecker is *P. p. scintilleps*, Swinhoe, now called *Dryobates pygmaeus scintilleps* (Sw.).

On the same page, paragraph one, I referred to the cuckoo-shrike. I have a skin from Shansi, unsexed, in which the wings are all black without the large clear white inner vanes of the middle of the primaries. *Pseu. C. sinensis* informs me that the white is said to be lacking in the male, but that it needs further confirmation.

On page 240 in the middle, the ibis-bill, Mr. La Touche points out, should not be called the "Ibis-billed oystercatcher." It is not at all like an oystercatcher, which we find at the seashore only, but more

¹⁶ Peking, September 25, 1924.

[†]According to the accepted rules of nomenclature this cannot be done. The name *sinensis*, with a description, was published in our July issue and it must stand.

like a curlew, in having a down-curved bill.* We find it only in the mountains along streams with much shingle and pebbles.

In the note at the bottom of page 241, the editor made a guess that the bird I named Rock Grouse, near the end of the article, is the pueras pheasant. Rock grouse is my rough translation of the Chinese name "Rock chicken," *shih chi* 石雞. It refers to the chukar partridge, formerly called *Caccabis chukar*, var. *pubescens*, Sw., but now known as *Alectoris graeca pubescens* (Swinhoe). The pueras of the Eastern Tombs, however, is *Pucrasia xanthospila xanthospila*, Gray. Mr. La Touche says that so far as he knows *P. darwini* occurs in Chekiang and West Fukien only, and that *P. joretiana* is found in Anhui. It is called *sung chi* or "pine chicken" by the Chinese.

On referring almost all my bullfinch specimens to Père Courtois of the Zikawei Museum for comparison with other skins, I find a curious mix up in my notes of the March number, page 139, but with a change of names its statements are correct. The beautiful pair of bullfinches referred to in the second paragraph, which I called *Pyrrhula pyrrhula major*, Brehm, prove to be, along with other specimens from the Eastern Tombs, *P. p. griseiventris*, the lower parts of the female being of a brownish gray with a reddish tone, and all the lower parts of the male, except the lower abdomen, being rosy red; the feathers of the back also having a reddish cast, the inner tertial being red on the outer web, rump, under wing coverts, and lower abdomen white; mask, top of head and tail deep glossy black. But, strange to say, among the specimens from the Eastern Tombs, was one that is *Pyrrhula camina*, Eulrid, or Cassin's bullfinch. It is similar to *P. p. major* and *griseiventris* but is of a very dark ashy grey below, with none of the brown tint of *griseiventris*.

Pyrrhula erithaca wilderi is represented by three specimens in which the difference from *griseiventris* is striking in that the mask extends only an eighth of an inch from the base of the bill all round, except that it reaches to the front of the eye, the crown being greyish not black like *griseiventris*. The middle of the belly is whitish in the supposed female, but with a distinctly greenish yellow tinge in the male. Dr. Hartert suggests that this is not a good sub-species, being described from but one female specimen, and that it may be *griseiventris*, but besides the differences mentioned above, the measurements vary widely, being as follows in two specimens now before me, *griseiventris* measurements being in parenthesis: Culmen 11 mm. (13); wing 74 (91); tarsus 18 (19); tail 56 (73).

In the January number, page 62, third paragraph, where I mention the white necked crane, I should have said that there was an even possibility of having mistaken this for *Magdalen's monachus*, the hooded crane, which also occurs here and has the neck white. The specimens we have are all of this latter species.

* This bird long ago received the name *his-billed oystercatcher*, and is in fact more nearly related to the oystercatchers than to the curlews. We fail to see why its popular name should be changed.—436.

These mistakes emphasize once more the danger of being too certain of identification of these slightly differing varietal forms from the manuals alone. Comparison with good series is essential, but impossible to some of us without sending the specimens away to the museums.

An example in point is a grasshopper warbler of which we secured a good series of six or seven young and adults of both sexes at Peitaiho during the present summer between August 28 and September 11. They answer well to the description of *Locustella naevia straminea*, Seeböhm, the Eastern grasshopper warbler, with a limit of eastern range, according to the books, of the Altai Mountains, and they have some differences from our *Locustella lanceolata* or lanceolated warbler, especially in the formula of the primaries; but we hesitate to call them by the former name until they are compared with specimens from other places.

We also secured young and old specimens of the common blue-headed wagtail (*Motacilla flava thunbergii*, Bullberg), formerly called *M. f. borealis*. There were specimens also that seem to be *M. f. macronyx*, Stresemann. If correct this is a new variety to us, which ought, however, to occur on migrations.

Mr. Hubbard and I also secured some other birds of interest to us late in August and early in September. *Falco cherrug milvipes*, the saker falcon, has often been seen in the market for sale, and this was the first time that we had seen it wild or shot it. Several fine specimens of the eastern marsh harrier were seen and two young females were shot which showed no white feathers in the rump. We do not know whether we are mistaken in the identity or whether the young and perhaps melanistic birds do not show it. A greater spotted eagle, *Aquila maculata*, oystercatchers, Caspian terns, both Nordmann's and the common tern of the variety *Sterna hirundo tibetana*, were collected. On September 10 the Siberian blue chat (*Larvivora cyane*) was in the fields and on the grassy hillside among small pines in thousands, and the brown flycatcher (*Muscicapa latirostris*) in almost equal numbers. The next morning the former but not the latter had all disappeared, and other forms had come in on the wings of a rainy northeaster.

In August, having the opportunity of observing in Peking, Peitaiho and Hsüchoufu, Kiangsu, my list for the month rose to 99 species. The last Peking swift was seen on the first day, though a few others may have passed through after that; but at Peitaiho all swifts seen up to September 12 were the white-rumped species. Among less common birds shot or seen were the avocet, oystercatcher, black-winged stilt, bar-tailed and black-tailed godwits, wryneck, purple heron, pygmy curlew and broad-billed sandpipers (*Limicola falcinellus sibirica*). Blue-winged teals or garganey were shot on August 11, lapwings on the 28, and common sheldrakes on the 30. Redhead ducks or pochards, mallards and great crested grebes were appearing in the Peking lakes, September 22. At the same time the young of the little grebe and the moorhen were following the mothers round in small clusters. Green wing teal, pintail and other ducks were in great numbers on the 12th at Peitaiho. Up to date the number of species observed this month is 87.

ERRATA

- P. 62, Par. 3: *Megalornis vipio* (Pallas) may have been *M. monachus*, which also has the white neck, and both occur at Peitaiho.
- P. 138, line 4: of heading. *Pyrrhula p. major* change to *Pyrrhula cassini*, Baird.
- P. 139, Par. 2: Line 1, *major* Brehm, change to *griseiventris* La Fresnaye.
 Line 14, *griseiventris* change to *cassini*, Baird.
 Line 16, *major* change to *griseiventris*.
 Line 17, "this form" refers to *P. p. major*.
- Par. 3: Line 2, *sanguinolentus* change to *ussurianus*.
- P. 239, Par. 2: Line 10, *semicoronatus* (Licht) change to *scintilliceps* (Swinhoe).
- P. 241, Note at bottom: Change to *Chukar partridge, *Shih chi* 石雞 "rock chicken," *Alectoris graeca pubescens* (Swinhoe), formerly called *Caccabis chukar* var. *pubescens* Sw. The pucras pheasant of the Eastern Tombs area is not *Pucrasia darwini*, which occurs in Chekiang, but is *Pucrasia xanthospila xanthospila* Gray, Mongolian pucras, *sung chi* 松雞 or "pine chicken." *P. joretiana*, Heude, occurs in Anhui.
- P. 350, Lines 1 and 2: *sinensis* change to *minor*. A letter from Mr. La Touche suggests that this "new form" may be the same as one that he described from Fukien, namely, *Hirundo urbica nigrimentalis*, Hartert, originally called *Chelidon cashmiriensis nigrimentalis* Hart, and my specimens have exactly the characteristics he gives, the tail coverts not all white but the longer ones black, wing 92-96 mm., and a black fleck on chin.
 Line 7: These specimens prove to be the Gull-billed Tern, *Gelochelidon nilotica addenda*, Mathews, formerly supposed not to come so far north; or *G. n. nilotica*, given as occurring eastward to south Mongolia. Nordmann's Tern, *Sterna longipennis*, Nord., also occurs among our specimens from Peitaiho.
- P. 350, Line 32: *U. s. sanguinolentus* change to *U. s. ussurianus*, Buturlin.

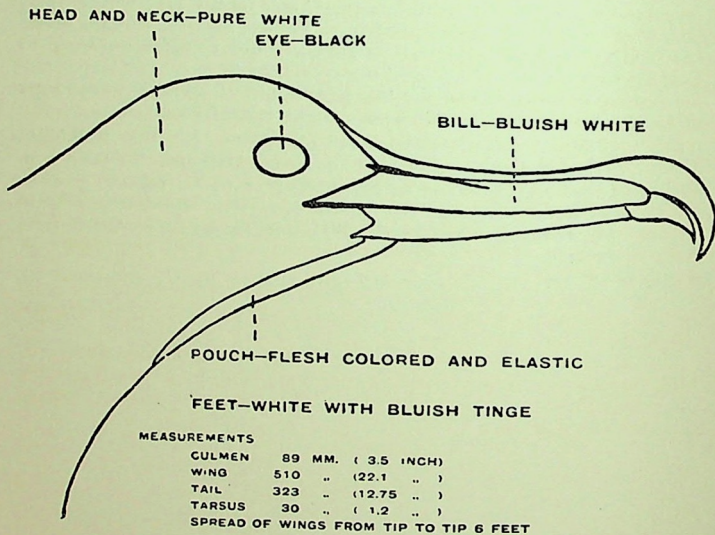
A FRIGATE BIRD AT PEITAIHO

BY

H. W. HUBBARD

While playing tennis at East Cliff, Peitaiho, on the afternoon of July 11th, our attention was arrested by a large bird, which sailed leisurely along through the air and came directly over the courts, as though much interested in the game. The black body and forked tail brought to mind at once a paragraph in Mr. J. D. de LaTouche's "Notes on the Birds of North-East Chihli," where he says:

"I saw on the 19th of August, 1915, circling over the cliffs and harbour at Chinwangtao, a large bird which must have been a Lesser Frigate-bird. On the 5th of October following, a friend saw circling over the harbour a large black bird with deeply forked tail, which was doubtless another example of this bird. The Smaller Frigate-bird occurs in summer on the coast of south-east China and has been seen or taken on the Lower Yangtse and at Shaveishan, but until 1915 it had not been noticed so far north on the China coast." (Ibis, Jan. 1921).



LESSER FRIGATE BIRD, MALE, TAKEN AT PEITAIHO, CHINLI,
JULY 12, 1924.

A FRIGATE BIRD AT PEITAIHO

The bird sailed along, spending about half an hour near other tennis courts on the hill, and then disappeared along the coast.

The following morning, as I arose from breakfast, Master George Lowry brought in word that the bird was again in the neighbourhood. I had meantime looked into my books, supposed to cover birds of this part of the world, and had discovered that neither Hartert nor Dresser, world authorities on birds of the Palaearctic region, even mention this bird. I therefore decided that this individual must be sacrificed to the interests of science, in order to get it identified absolutely and add a valuable bird to our collections. Also, there is always the possibility of finding a new species.

Seizing my gun and some shells, I followed the bird along the shore as it soared high above the waves, sometimes going so far out to sea that it was hardly discernible, again coming in close to the shore and almost within gunshot. On two occasions it dived through the air to the surface of the water for its food. Often it varied its leisurely flight by dropping a few feet in the air to rise again against the wind in indescribably graceful curves. Several times it soared over me, but at such a height that I felt it useless to shoot. I could see plainly its white head and a triangular white patch across the abdomen. After shadowing it for a couple of hours, I began to get impatient and once, when it passed over me at a height of 80-100 yards, I emptied my gun at it, only to hear the futile shot rattle through its wings. At this bombardment, the bird shook itself and rose to twice its former height carefully to look me over.

I now decided to resort to strategy and left the bird in the hope of buying fish for bait. My plan was to throw these into the water near cover and to wait for the bird to come around. Not finding fish, I went home for some waders shot the day before, and I took these to the shore near the spot where the much-desired bird was now soaring. Barely had I thrown them down when the great bird sailed down to within easy range and fell at the first shot from my shotgun. With mingled feelings of regret and achievement, I took my prize home for examination and skinning.

An outline of the head together with measurements will be found in the accompanying figure. A fish four and one half inches long was taken from the gullet.

I have at present no access to books accurately describing this bird, but suppose it to be the Lesser Frigate Bird, *Fregata ariel* (Gould), observed at Chinwangtao by Mr. LaTouche. It is also sometimes called the Man-O'-War Bird.*

*This bird has been definitely identified as *Fregata ariel* (Gould), and has been listed as such in Wilder and Hubbard's "List of Birds of Chihli Province," Journal N. C. Br. R. A. S., Vol LV, p. 221.—Ed.

THE INSECT FAUNA OF MANCHURIA

BY

EDWIN C. VAN DYKE

(Professor of Entomology, University of California, U. S. A. Prof. of Entomology, South-eastern University, Nanking, China.)

For a number of years, the world has had a superficial knowledge of the insects of Manchuria based upon specimens captured in that territory by various travellers and collectors. There has, however, never been a comprehensive study made of the insect fauna as a whole, and though the region has been generally associated with Japan as regards the peculiarities of its animal life as is implied in the appellation, "Japano-Manchurian Region," used by Alfred Russell Wallace in his "Geographical Distribution of Animals," the association was based mainly upon the resemblance of the birds and mammals. This being the case, I thought that the ideas which I have formed with regard to the peculiarities of its insect fauna might be interesting, not only to the students of insect life, but to those of geographical distribution in general.

During the year 1923, while associated with the South-eastern University at Nanking, China, I had the opportunity to collect extensively not only in Kiangsu Province, the province in which Nanking is situated, but in other portions of north-eastern China, as well as to study much of the material which had been assembled by others in that territory. The early part of the summer I was in Japan collecting in various parts of the empire and studying various Japanese collections, the most important of which was the large and well determined collection of Dr. S. Matsumura of the Hokkaido Imperial University at Sapporo. I had, however, been more or less familiar with the Japanese insect fauna, particularly the *Coleoptera*, for years. During the late summer, in company with Mr. H. Q. Fu, the secretary of the College of Agriculture of South-eastern University, I travelled through much of Manchuria and there investigated and collected quite extensively.

Manchuria is not only a vast territory but a most varied one in almost every regard, with decided differences in its vegetable life according to locality. The insects, which, to a greater or less degree, are always influenced by one or both of these, would therefore be expected to vary in the different parts of the region, and such I found to be the case. In the region to the north-west, in the Great Hingan Mountains, the climate is very severe, the winters cold and the summers short. The mountains support a forest growth of poplar and birch, both white and black, on their slopes and larch along their summits. Throughout the more northern portions of Manchuria generally, so I am informed, similar conditions prevail. The insects which are found in this region are such as to be found in Siberia, both those kinds found about the timber as well as those which dwell on the ground. The fauna would, therefore,

THE INSECT FAUNA OF MANCHURIA

be called Siberian. In Eastern Manchuria, in the mountains along the Korean border, we again meet with a forested area. Here the timber is of a more varied type, the forests more mixed. In the higher mountains, there is considerable white pine and true fir, while at the lower levels numerous species of oak, elm, linden, maple, and other species of deciduous trees are to be observed as well as numerous shrubs, vines, and many evergreens, such as laurels. Some of these are the same as are to be found in Korea, as would be expected, but the general appearance of the forests as a whole is very much the same as can be found here and there about the temples in many parts of the hilly country of Eastern China. The insects that were captured here were in many cases either very closely related to or absolutely identical with those to be found in Eastern China generally. There were also many of the species which bore an almost equally close relationship to Japanese species. Thus this fauna would merit the name, Japano-Manchurian, as used by Wallace, but in as much as this exists not only in Eastern Manchuria but throughout Southern Manchuria generally and is practically the same as that found in much of the northern and eastern parts of China proper, it seems that it would be better to use a more comprehensive term like Chino-Japanese fauna to designate it. Mixed with this fauna are also a few wide ranging species which more properly belong to the true Oriental Fauna, so distinctive of South China and the countries farther south. These species have no doubt worked their way northward and eastward along the coastal regions. In the central and western part of Manchuria, particularly in the dryer and more arid parts, there are also elements of another fauna to be found. This is the central Asian or Semi-Desert fauna, which is so characteristic of the hot, dry, and barren regions of Turkestan and Central Asia generally. This fauna is very extensive, extending on the one hand westward and south-westward through the Aral-Caspian Depression to link up with that found in the Circum-Mediterranean region, and on the other hand easterly and north-easterly along the margins of the Desert of Gobi and north of Thibet, through Mongolia, Chihli, and into Manchuria, where it practically runs out. To this fauna belong a number of the ground loving beetles, certain grass-hoppers, and so forth. Manchuria thus contains elements of four distinct insect faunas within its boundaries: the Siberian occupying the greater part of the northern part of its territory; the Japano-Manchurian or more properly the Chino-Japanese, occupying most of the eastern and southern parts of the country; a small infusion of the Oriental in the south and the Mid-Asian or Semi-Desert in the west central part.

SOME CHINESE TREES AND TREE PRODUCTS

BY

FU-LIANG CHANG, M.F.

張 福 良

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During recent botanical explorations in China, the Chinese flora has been a source of continuous surprise in its wealth of species and even more so in its ornamental character and the suitability of a vast number of its plants to be introduced into parks and gardens throughout the temperate regions of the world. The Chinese flora is by far the richest temperate flora in the world. More kinds of trees are found here than in the rest of the north temperate regions put together. Competent authorities estimate that China has at least 15,000 species, out of which half are peculiar to the country.

The gardens of the West have been greatly enriched by the acquisition of plants from China. The tea and rambler roses, chrysanthemums, Indian azaleas, camellias, greenhouse primroses, mountain peonies and garden clematis have all come from China. There is much more, particularly from West China, waiting to be introduced to the lovers of plants. This is also true of a number of fruits: the orange, lemon, citron, peach, apricot and the so-called European or English walnut have their original home in China. A few years ago Frank Meyers, an agricultural explorer from the United States Department of Agriculture, came to Changsha. He was collecting a large amount of the Ussurian pear seeds of West Hupei to send to America. The pear from this tree is as big as a cheery and non-edible, but the seedling from it forms a wonderful stock upon which the American species can be grafted. The grafted tree is immune to the fire-blight which was destroying the American pear trees. In the same way the Chinese chestnut is being introduced into the United States because of its greater resistance to blight.

A great deal of injustice has been done to the Chinese flora, due to ignorance on the part of western botanists. A number of Chinese species have been claimed by other countries and therefore named after their adopted lands. Thus a beautiful pink-flowered myrtle tree, native to the Yangtze Valley and southward, has been named *Lagerstroemia indica*, as if its original home were India. Trees and plants first introduced to Europe and America were mostly from Japan, which had introduced the same from China. A number of them such as the honeysuckle (*Lonicera japonica*), the boxwood (*Buxus japonica*), the cryptomeria (*Cryptomeria japonica*), and the pagoda tree (*Sophora japonica*), having the second part of their name "*japonica*," are really native to China.

A striking coincidence, which still puzzles scientists for a full explanation, is that a number of species, which were believed to be peculiar

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to Eastern North America, have their counterparts in China and nowhere else. Magnolia, witch hazel, catalpa, wistaria, hickory and sweet gum are a few examples. Furthermore there are instances of genera with two species: one species is found on the Atlantic side of the United States and the other in China. Such are the tulip tree 鵝掌樹 (*Liriodendron*), the Kentucky coffee tree 肥皂樹 (*Gymnocladus*) and the sassafras tree (*Sassafras*). Even trees that are common in the whole temperate zone, such as the oak, elm, beech, birch, hornbeam and chestnut, are more closely akin between the Chinese and eastern North American species than between the Chinese and European.

This phenomenon is explained by the fact that in geological ages when Asia and North America were more closely connected, the glacial invasion from the north forced the flora towards the equator. When this period was over, the glaciers receded but the recession was not as complete as before and the ice-cap was left in a more southerly latitude. Thus a large area, previously forested, was too cold to support vegetable life of any kind, causing a final division between the two hemispheres. This separation has isolated the vegetations of the two continents and made these two floras to-day so alike and yet geographically so far apart.

Among the economic trees of China bamboo is easily the most important. It supplies every conceivable need of the daily life of the people. It has somewhere about 33 species of which the *mau chu* 毛竹 (*Phyllostachys pubescens*), the *tsu chu* or the spiny bamboo 刺竹 (*Bambusa arundinacea*), the *nan chu* 南竹 (*Dendrocalamus giganteus*) and the *kwanyin chu* 觀音竹 or the feathery bamboo (*Bambusa vulgaris*) are most common and important.

The China fir or monkey pine 杉樹 (*Cunninghamia lanceolata*) is the most common timber tree in China. Its wide range covers all the Yangtze valley and southward throughout the warm temperate regions of China. It grows to a big size, 80 to 100 feet in height, and has a straight massive stem. With its pyramidal crown and dark evergreen stiff leaves, it makes a beautiful Christmas tree. Its wood is soft and used for general building purposes and indoor carpentry, and its bark for roofing. It is especially esteemed for making coffins, as the fragrant properties of the wood are considered to act as a preservative. In Szechwan a forest of this tree was buried in the ground for a couple of hundred years by an earthquake. Now the buried trees having been excavated bring a high price for wood in making coffins. The *Yinchen* 陰沈 (long buried) wood is worth 500 to 1,000 taels for a coffin.

The monkey pine will be the most important species for reforestation in the warm temperate regions of China. While it is not a fast growing tree, it is hardy against insects and fungi. It is one of the only two coniferous species that regenerate themselves by sprouts—the other being the redwood (*Sequoia gigantea*) of California. The management of forests of this species is therefore an easy matter, for, with proper cutting at the right time, regeneration will take care of itself by sprouts.

Another very common tree of wide range is the Chinese pine 黑松 (*Pinus massoniana*). It has practically the same distribution as the

monkey pine. Most pine trees around our neighbourhood are knotty and crooked due to poor pruning and bad management. When the Chinese pine is left alone, it produces a beautiful tree some 80 feet in height and 10 feet in circumference. Its bark is used to shingle the roofs of farm-houses and its wood generally for fuel. Only big trees are employed for building.

The above are the common coniferous timber trees in the warm temperate regions of China. The other conifers of ornamental value in this region are the Chinese cedar 刺柏 (*Juniperus chinensis*), the arbor vitae 側柏 (*Thuja orientalis*), the funeral cypress 白木樹 (*Cupressus funebris*) and the peacock pine 孔雀松 (*Cryptomeria japonica*). The last is the largest and most widely planted tree in Japan. The pine and arbor vitae in China are symbols of long life. Old specimens of these species are supposed to have spirits dwelling within them and are believed to have found the elixir of life. In birthday and new year celebrations, leaves from either tree form an essential part of the decoration.

Of the broadleaf or deciduous species, some are very useful as shade and ornamental trees, some for their special products such as oil, varnish, etc., and a few for their timber.

Chinaberry or pride of India 苦楝子 (*Melia azadirach*) is the best shade tree for this region. It is native to central and western China but has widely spread into the warm temperate and sub-tropical parts of the world. Its rapid growth and freedom from insect and fungous pests make it a very desirable street tree. Its showy panicles of fragrant lavender flowers and its feathery foliage make it a graceful lawn tree. For this part of the country there is no better shade tree than the Chinaberry. It has been introduced into the southern portion of the United States and has become naturalized there.

Wu tung or the phoenix tree 梧桐樹 (*Firmiana simplex*) is another hardy street tree. Slender and round-headed it is a tree of 50 feet height. It has smooth grey-green bark, coarse twigs and large leaves with three to five lobes. It is not exacting in soil and has no enemy of any sort.

Wu tung is the tree of Chinese landscapes. Practically all Chinese landscape pictures have this tree as one of their features. It has enjoyed the distinction of being the only tree upon which the phoenix comes to roost. A lute or flute made of this wood, when played by a master hand, will cure illness, quiet restless spirits and attract phoenixes, dragons and fairies to listen to the music. It is said in the Book of Odes :

鳳凰鳴矣於彼高岡

梧桐生矣於彼朝陽

"From yonder heights comes the song of the phoenix,
Where *wu tung* trees stand in the morning light."

The ginkgo or maidenhair fern tree 白果; 銀杏 (*Ginkgo biloba*) is the only surviving representative of the oldest genus of trees from pre-historic times. Its fossil remains have been found not only in Asia but also in West Europe, North California and Greenland. It is the

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link between the fern and the tree. To-day it exists only in China and Japan as a cultivated tree, being preserved to us by Buddhist and other religious communities who plant it in the neighbourhood of their temples.

The ginkgo is a slow growing tree, but is free from all sorts of pests. Its fine heart-shaped leaves, turning bright yellow in the late autumn, make it a very conspicuous mark in the landscape. Its nuts are roasted or cooked with other vegetables and are highly esteemed as food. Its wood is soft, straight-grained and used for making abacus beads, seals and other fancy articles. In Japan it is extensively used for the ground work of lacquer ware. Except for its slow growth, it is a very good shade tree. Avenues of this trees can be seen in the American capital, Washington.

The ginkgo is a long-lived tree. Some trees of this species in Shantung are claimed to be contemporaneous with Confucius. One of the three big trees on Kuling is a ginkgo and it has probably reached the thousand year mark in age.

The sweet gum or liquidamber 楓樹 (*Liquidamber formosana*) is one of the most common broadleaf trees in this region. It has a wide distribution from Formosa to Thibet, but Hupeh and Hunan probably form the centre of its range. It is a handsome tree, reaching 100 feet or more in height, with a straight trunk and a much-branched head. Its lobed leaves turn to a brilliant red or brown in autumn and remain late into the winter. Yuloshan, a group of hills opposite the city of Changsha, is rightly famous for the autumn colours of this tree. At its foot, in the rear of the Yuloshan College, there is a little summer house, called the Autumn Pavilion (愛晚亭), a resort for scholars and poets. This name is derived from a classical couplet describing the beautiful autumnal colours of this tree:

停車坐愛楓林晚

霜葉紅於二月花

"Descending from the chair I leisurely enjoy the liquidamber trees in their fall hues;

Their frost-bitten leaves are redder than the flowers of the spring."

The wood of this tree is largely used for the manufacture of tea chests for export. Chests made of this wood are supposed to be able to preserve the fragrant flavour of tea within.

One more tree, well known for its beautiful autumnal colours, deserving our mention is the Chinese pistacia tree or *huang lien shu* 黃楝樹 (*Pistacia chinensis*). It is a large tree, 60 feet or more tall, and will grow on dry gravelly hillsides. Its finely divided compound leaves turn wine-red in the delicate young foliage in the spring, and in autumn they change to flaming scarlet and gold. In California there is an avenue of this tree growing more lovely each year. It is a veteran of this tree that crowns the grave of Confucius in Shantung.

The young shoots and leaves of this species have a winter-green flavour and are eaten like those of the *shiang chun tree* 香椿樹 (*Cedrela sinensis*) as a vegetable. It is a hardy tree forming a good stock upon

which *Pistacio vera*, which produces the Italian pistacio nuts of commerce, can be grafted.

The most widely planted tree in North China is the black locust 刺槐洋槐 (*Robinia pseudoacacia*). It is a tree of medium size with long compound leaves and numerous spines along the branches, and is planted for both timber and shade. Its abundance of white fragrant flowers in the spring is very much liked by the people. Although it is a native of Europe, it has become naturalized in both North America and Asia. The Germans made plantations of this tree in Tsingtau and it is doing well in North China. When it is planted in Central China, it produces a wide-spreading crown and tends to be windthrown.

Now let us turn our attention to some trees cultivated for their products. China is very rich in vegetable oils, namely the rape oil 菜油 from a Chinese cabbage, sesamum seed oil 香油, peanut oil 花生油, poppy seed oil 罂油 from poppy seed but having no narcotic properties, soy bean oil 豆油, varnish seed oil 漆油, castor oil 草麻油, walnut oil 核桃油, persimmon oil 柿子油, tea oil 茶油 and wood oil 桐油. The first ten vegetable oils are from herbaceous plants and the last four from woody plants. Concerning the last three I propose to go more or less fully into detail.

The wood oil tree or *tung shu* 桐樹 (*Aleurite fordii*) is a fast growing tree, about 25 feet tall. Its numerous white flowers with pink and yellow markings are a pretty sight in spring. The fruits are green and apple-like. They break into three parts when ripe in September. They are collected in heaps before this period and are covered with straw or grass to start fermentation. The heat given out by this process quickly rots the fleshy parts of the fruit. The seeds are then removed and are ready for the extraction of the oil.

The seeds are first crushed in a circular trough beneath a heavy stone wheel. Then the mass is partly roasted in shallow pans and placed in wooden vats with wicker bottoms to be thoroughly steamed over boiling water. Next with the aid of an iron ring and straw it is made into circular cakes about 18 inches in diameter. These cakes are arranged edgewise in a large press, and when the latter is full, pressure is exerted by driving in one wedge after another, thereby crushing out the brown oil, which falls into a vat below. This crude oil is about 40 per cent. of the weight of the seed. It is packed in wooden tubes and wicker baskets, and exported as wood oil. In recent years this oil has found a good market in the United States. Hankow is a great export centre of this raw material. In 1900 the quantity exported from that city was about one-third of a million piculs, in 1910 three-fourths of a million piculs and in 1920 over a million piculs.*

The wood oil is extensively used in China. It is a varnish, a water-proofing material and the chief paint-oil of the country. Junks, water buckets and other out-of-door furniture are not completely finished without a coat of wood oil. It is further made into other kinds of oil.

* A picul is equal to about 130-lbs.

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After boiling for about an hour, when the oil becomes syrupy, it is called "Pei Yu" 配油, used for mixing with varnish and paints. The common "Kwangyu" is manufactured as follows: 100 catties* of wood oil are boiled for about two hours. Added to it during the boiling are eight pounds of "T'o Shen" 佗僧, a mineral material containing some lead and lead oxide. Sometimes eight ounces of marble-sized balls of earth called "T'u-tzu," 土子, containing some manganese are also added. Both minerals are used for hastening the process of oxidation and thus increasing the drying effect of the finished product, "Kwangyu" 光油. It is a grey sticky substance, used for polishing floor and furniture and also for applying to silk gauze and pongee to make them water-proof. Wood oil is sometimes burned for its soot, which forms an important ingredient in the manufacture of Chinese ink.

The tea oil plant 茶油樹 (*Thea oleifera*) is an evergreen shrub, about 5 or 6 feet tall. It has dark green glossy leaves and beautiful flowers in November. Its fruits are as big as chestnuts and are treated in about the same way for the extraction of the oil as those of the wood oil described above. In Hunan and Kiangsi this plant is largely cultivated for its oil which is used for cooking. Inferior grades of this oil are somewhat poisonous. In West China tea oil is used for adulterating more expensive rape oil and also by women as a hair dressing. The refuse cake is valued as a fertilizer. Some time ago we saw an oil press in operation across the Siang River and it seemed to be a very efficient outfit.

The common persimmon tree 柿子樹 (*Diospyros kaki*) has many varieties and a very wide range. It is a large tree, often 60 feet tall, and is cultivated for its delicious fruit. The fruit of a wild variety, growing on the mountains of Central and West China, is gathered for making into persimmon oil. It is plucked green and reduced to a pulp by a wooden mallet. The pulp is allowed to ferment for 30 days in cold water: the liquid is then separated from the residue and becomes a colourless varnish. The leaves of the Chinese privet are sometimes placed in this varnish to give it a desired brown colour. This varnish or oil or glue 膠水, as the people call it, is used for water-proofing paper umbrellas, the last coat of which is finished with "Kwangyu."

The varnish tree 漆樹 (*Rhus vernicifera*) is a medium-sized tree, from 30 to 60 feet tall. Its large compound leaves, which turn to scarlet or orange in autumn, and its abundance of fruit, rich in fatty oil, make it a favourite tree to plant in Western Hupeh and Szechwan along the margins of cultivated fields.

The tree is chiefly noted for its varnish. The tapping begins after the tree is over five years old, when it has also reached six inches in diameter. The tapping operation begins in late June or early July and is continued for seven weeks or more throughout the summer. Those who have seen the tapping of turpentine from the pine in the Southern States will note the close resemblance in tapping for lacquer. Oblique incisions 4 to 12 inches in length and one inch in width are made in the bark

* A cattie is variously estimated as 1½-lbs. or 1¼-lbs.

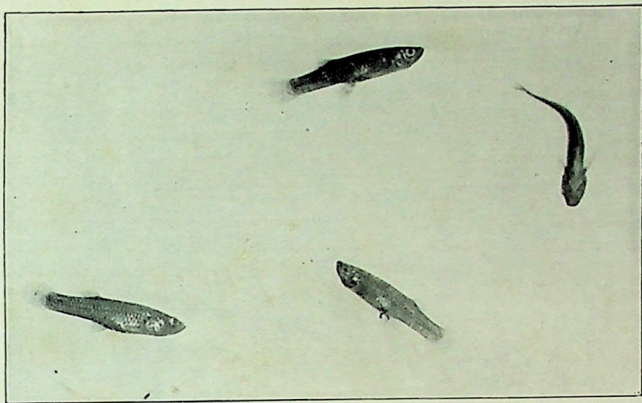
down to the wood in the morning, and the sap which exudes is collected in bamboo tubes and other receptacles. These receptacles are emptied every evening. In showery and damp weather the lacquer dries rapidly and often has to be scraped away. The exudation of the sap from a cut will continue for about a week, after which fresh incisions will have to be made. A tree can stand about seven operations for a season of seven weeks and then must be allowed five to seven years to recover. A large tree yields five to seven pounds of varnish. When the sap first exudes, it is pure white in appearance, but quickly oxidizes to greyish-white, changing to black. To prevent this process, crude varnish is covered with a layer of oil paper, as soon as it is collected.

The varnish tree has a poisonous property, very toxic to some people, when plants or parts of them come into contact with the body. The poison (toxicodendrol) is contained in a heavy non-volatile oil, very minute quantities of which may cause eruption on the skin. This property has militated against its use in western lands, until chemistry has found out some means whereby this poisonous property can be neutralized or eliminated.

One peculiar quality of the Chinese lacquer is that it hardens only in moist atmosphere and remains in a sticky and moist condition if exposed to sunlight. Some years ago a shipment of this varnish was sent to London for a trial. It was applied in the same way as ordinary varnish and of course refused to harden. Thereby the Chinese varnish was condemned as worthless! The slow drying of the lacquer at ordinary temperatures is due to the slow absorption of oxygen. Complete oxidation is due to the action of a ferment (laccase) which is only active in a certain humidity of the atmosphere.

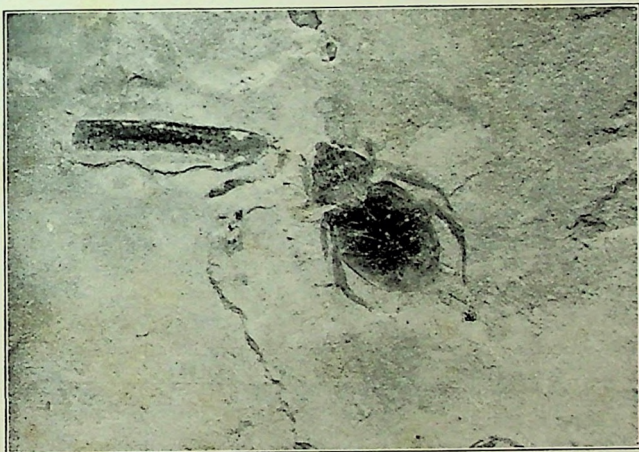
The varnish is black in colour. When applied to wood floors, pillars and furniture, it is the most indestructable varnish known. Not only boiling water but also acid makes little impression upon the varnished wood. "*Pei Yu*," i.e., wood oil after being boiled for an hour, is added to the varnish, will change the colour to brownish and cause it to dry more quickly. When mercuric sulphide or arsenic sulphide if added to the above "brown varnish," a red or yellow varnish is produced. A great deal of raw varnish is exported from the central and western parts of China to other parts of the country and also to Japan. In early days, when the foreigners first settled at Shanghai, they used this varnish extensively for all their furniture and other indoor work. The carpenters whom these foreigners employed were Ningpo men, hence they dubbed it "Ningpo Varnish."

(To be continued).



B. T. Prideaux

Mosquito-eating Fish, known popularly as Top Minnows, and to science as *Gambusia affinis* (Baird and Girard); $\frac{1}{2}$ natural size.



By courtesy of "The North-China Daily News."

The Fossil Beetle recently found in Lower Cretaceous Rocks in Shantung

BIOLOGICAL NOTES AND REVIEWS

MOSQUITO FISH IN SHANGHAI. We have recently received information from Mr. A. W. Herre, head of the Division of Fishes of the Philippine Bureau of Science, Manila, to the effect that the little mosquito fish that has been introduced into ponds and artificial pools in Shanghai with such marked success is not a native of the Philippines though brought to this port from Manila. The species is known to science as *Gambusia affinis* (Baird and Girard), and popularly as the "top minnow." It is a native of the southern United States of America, and was originally taken to Manila about sixteen years ago by Mr. Alvin Seale, fisheries expert for the Philippine Government.

Experiments in Shanghai during the past summer have shown that this little fish breeds very rapidly in this area, and is a very effective means of destroying mosquito larva. It has also been proved that the mosquito fish can survive the winter here. This being the case there should be no difficulty in establishing this valuable species in all stagnant waters in and round this settlement, and, in time, throughout the whole of the Yang-tzu Delta.

BIRDS' NESTS. Under this title the *French Colonial Digest* for August has an interesting article upon the commodity so valued by the Chinese as a table delicacy. According to the article the value of "birds' nests" as food was discovered during the reign of the Emperor "Gia-long," who had offered a "reward to any of his subjects who would discover inside the boundaries of his states a foodstuff or drink able to give a great and new extension and impulse to the native trade." The discoverer of the nests was duly rewarded, and became, with his family, the sole proprietor of the export business that arose in connection with his discovery, enjoying certain privileges at the same time.

The author of the article is wrong in stating that the birds that build these nests are swallows; nor are they confined to Annam. The birds of the edible nests are members of the swift family (*Micropodidae*), far removed from the swallow family (*Hirundinidae*), and the species that produces the most valuable nests is known as *Collocalia fuciphaga*.

The Chinese are the main purchasers of the commodity, which is produced by the saliva of the birds, and is obtained at great risk to the collectors, as the nests are fastened to the surfaces of unscalable cliffs at dizzy heights from the ground.

AMERICA'S WAR ON CROWS. According to papers and periodicals from the United States, a number of states have decided to wage a war of extermination against the common crow of that country. It is pointed out that there are some 200,000,000 crows in the country, doing damage to crops, it has been estimated, to the tune of \$1.00 per head per annum, which damage, and the damage they do to game birds and animals, is, it is contended, in no way balanced by the good they do in exterminating noxious insects. The facts upon which these figures

and estimates are based are the result of careful investigation by state biological departments, and it appears that the case against the crow as an arch criminal is a strong one. Nevertheless, it is always a dangerous thing to interfere with the "balance" of life that is usually so nicely maintained by Nature, and there may be some as yet unknown factor that will upset all the calculations of the biologists, so that the extermination of the crow may prove to be a curse rather than a blessing. In any case we would not advise the adoption of a similar course of action in China, for from our own observation, crows are a great destroyer of noxious insects of many kinds, especially during the nesting season.

THE OLDEST KNOWN BEETLE. From time to time paleontologists report the discovery of fossil members of the insect world, which show that this type of animal life has existed on the earth without any very great change from periods of the greatest antiquity. Recently a magnificent specimen of a fossil beetle, closely related to our present day scarabs (*Scarabidae*), has been unearthed in rocks of the Lower Cretaceous Period in Shantung by Mr. H. C. Tan of the Geological Survey of China. Dating from a period of something like 15,000,000 years ago, this specimen is undoubtedly one of the oldest, if not the oldest, of its kind known. It has been given the name of *Proteroscarabæus yeni*, having been called after Dr. W. W. Yen, who has done so much for geological work in China. This species is believed to represent the prototype of all our present day scarabæid beetles.

SWARM OF BEETLES IN SHANGHAI. One of those remarkable visitations to which Shanghai appears to be peculiarly subject occurred on August 5 last when an enormous swarm of beetles suddenly appeared on a comparatively narrow strip of the Bund. According to an account by Mr. A. L. Hall, an eyewitness, which appeared in the *North-China Daily News*, the beetles came in a cloud over the Whangpoo from a direction almost due west, flying low, apparently with the wind, and settled in enormous numbers upon the grass plots on the Bund, roughly between the two statues that grace that water-front. This was at 11 o'clock in the morning. By the afternoon the beetles, excepting those that had been crushed or injured by the traffic, had completely disappeared. Mr. Hall has sent us some specimens of these beetles and we find that they are members of the genus *Popilia*, apparently belonging to the species *japonica*. There is considerable variation in the colouring in the members of this species, which probably accounts for the fact that they were thought to represent several forms.

A correspondent in the same paper on August 11 made an attempt to identify the species, apparently without seeing actual specimens—always a dangerous thing to do—but his diagnoses cannot be accepted.

Without having been on the spot at the time, and without being able to follow the swarm of insects to its origin, it is impossible to account for the phenomenon, but it may be stated that we have had experiences of similar occurrences in other parts of this country, notably along the

Mongolian frontier. The genus *Popilia* belongs to the great order *Lamellicornes*, or chafers, of which the grubs, or larvæ, all live underground, feeding upon various organic substances, such as the roots of plants. What probably happened in the case under discussion was that in some fairly restricted area on the Pootung side of the river circumstances had favoured the increase of this particular beetle, and that owing to favourable climatic conditions, (probably the unusual dryness of the season), the whole of the previous season's brood of eggs had matured and the perfect insects liberated at once. The result of such an occurrence would be that all the insects, taking to the wing at about the same time, would form into a swarm and be carried in the direction of the prevailing wind. That the area of origin was more or less limited is obvious from the fact that the swarm was not more widely distributed.

WHALE CAUGHT AT AMOY. It is not often that a whale is counted in the fisherman's haul. Apparently, however, this is what occurred in Amoy harbour, when, on August 29, a whale was seen and attacked by a number of local fishermen. It was driven into the maze of steel girders and piles where a new wharf is under construction and finally captured and hoisted ashore. From photographs received by the *China Press* in Shanghai it is apparent that the cetacean in question was a young specimen of one of the rorquals, or fin-back whales, which belong to the group known as "whale-bone" whales (*Mystacoceti*) on account of their having in their upper jaws the valuable substance known as baleen or whale-bone, instead of ordinary teeth as possessed by most of the "toothed whales" (*Odontoceti*). The specimen is certainly not a grampus, as suggested in the local press, nor is it allied to the "blackfish," or pilot-whale (*Globiocephalus*), both of which are "toothed whales."

Judging from its size (14-ft. in length, and about 1,500-lbs. in weight) the animal must belong to one of the smaller species. It is probably what is known in the Pacific as the sei whale (*Boldenoptera borealis*, Lesson) which ranges in length in the adult from 30 to 45 feet. The shape of the head, body, and especially of the dorsal "fin" indicate this. The so-called lesser rorqual (*B. rostrata*) and its near relative, Eden's fin-whale (*B. edeni*), the former from the North Pacific and Atlantic, and the latter from the Indian Ocean and neighbouring regions, though smaller than the sei, or Rudolph's whale, as it is alternatively called, are less slender in shape than is indicated in the photographs of the Amoy whale, and are at the same time, differently coloured. The sei whale forms one of the main supports of a very important whaling industry in Japan.

It is interesting to note that the Amoy specimen was purchased by Dr. Lim Boon-keng, president of the Amoy University, for the museum of the latter institution.

ENTOMOLOGICAL RESEARCH IN CHINA. Dr. F. Silvestri, Professor of General and Agricultural Zoology at the High School

of Agriculture, Portici, Italy, and Entomological Explorer of the University of California, Berkeley, is out in the Orient making special investigations upon the parasites of various citrous plants. He has already visited Pakhoi, Hongkong and the South generally, as well as Foochow. He is now visiting Japan on his way to Formosa, after which he will return to Fukien, where he will carry out the main part of his work. Later he hopes to extend his researches into the Upper Yangtze Valley. He has collected large numbers of insects that prey upon citrous plants, as well as their parasites, and these have been sent to California. This is highly important work, and one that must prove of great value to all countries where such fruits as oranges, lemons, pomelos and grape-fruit are cultivated. The important thing is to find parasites with which to combat the predacious insects, and Dr. Silvestri is very optimistic as regards the results he has obtained in this direction.

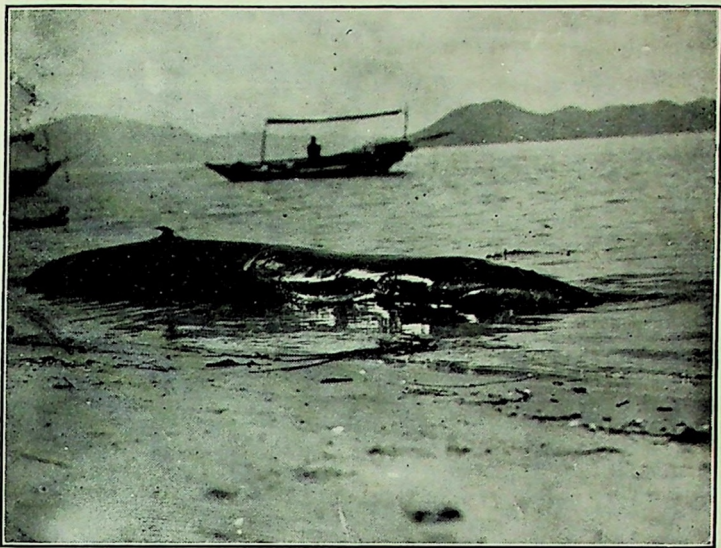
THE NATURALIST IN MANCHURIA, VOLS. II & III, MAMMALS AND BIRDS. By Arthur de C. Sowerby, F.R.G.S., F.Z.S., M.B.O.U., Tientsin Press, Ltd., Tientsin.

We have received an advance copy of this work, which should prove of the greatest value to biologists in China as well as of Eastern Asia generally. The two volumes, dealing with the mammals and birds, respectively, of the Manchurian Region, are in one binding. The author, who is well known as a naturalist and explorer in these parts, defines the Manchurian Region as that part of Eastern Asia formerly under the sway of the founders of the Manchu dynasty before the conquest of China, and it includes the three provinces of Manchuria Proper (Fengtien, Kirin and Heilungkiang) as well as the Amur Province, or Pre-Amur, the Ussuri and the Primorsk, or Maritime Province of Eastern Siberia. He finds that this region has no characteristic fauna of its own, but is a meeting point of other faunal sub-regions, namely: the Siberian, which is forest, tundra and park-land; the Mongolian, which is arid, sandy or grassy "steppe" land; the North-east China, which is characteristic of the latter country; and the Japanese, which is distinct in many ways from the others.

All the birds known to be indigenous to Manchuria, those that only breed there, and those that pass through on migration are listed and *described*, the reference to the original description of each species also being given. As there are some 458 species in this list, the work involved must have been tremendous. Mammals have been treated in the same way. The value of this work to the naturalist in China lies in the fact that many of the species of birds and a number of the mammals are common to both countries, while the author has made interesting comparisons of the two faunas.

There is an excellent map showing the faunal regions, bird-migration routes, breeding grounds, winter resorts, and collecting and observation posts. There are also many excellent and interesting illustrations.

These volumes are to be followed in due course by two others dealing with the reptiles, amphibians, fishes, and invertebrates of the Manchurian Region.

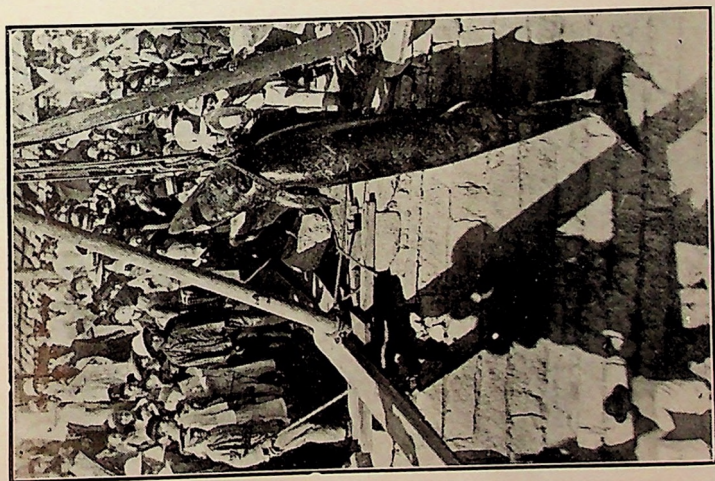


The whale recently captured at Amoy lying in shallow water. This picture shows the shape of the dorsal "fin," which helps to identify the specimen as being probably a Sei, or Rudolphi's, Whale (*Balaenoptera borealis*).



Photos by courtesy of the "China Press."

The mouth, propped open, is that of a "whale-bone" Whale (*Mystacoceti*), and not that of a Toothed Whale (*Odontoceti*).



Photos by Courtesy of the "China Press."

Two views of the Amoy Whale while it was being hoisted on to the Wharf.

SHOOTING AND FISHING NOTES.

SHOOTING

THE OUTLOOK FOR 1924-25 SHOOTING SEASON.—Owing to the outbreak of civil war in the provinces of Kiangsu and Chekiang the prospects for this season's shooting are exceedingly poor; in fact, it is doubtful if any shooting at all will be had by Shanghai sportsmen unless they go very far afield. We have not heard if any shooting has been had as yet in the Nanking district, which, at the time of writing, is free from actual hostilities, though it is hardly likely, under present conditions, that sportsmen will relish wandering about over troop-infested country. The Henli, Soochow and Wusih districts are entirely out of the question as shooting grounds, and even the snipe grounds in the immediate vicinity of Shanghai are impracticable. We have heard, however, that one ardent sportsman enjoyed some good snipe shooting in the last week of September on the Pootung side of the Whangpoo, below the Asiatic Petroleum Company's installation.

Early in September snipe began to come in in rather satisfactory numbers, and everything promised a good season.

The war in the north is likely to effect the Tientsin residents' shooting this season, since with troops moving up and down the railway lines, and all ordinary passenger traffic at a standstill, conditions are not likely to prove attractive. We have received a report, however, from Tientsin, dated October 8th, to the effect that a party from Tientsin secured thirty odd duck in the Hsin-cheng district (between Tientsin and the coast) during a week-end shoot.

Snipe began coming in at Chinwangtao about the middle of August in good numbers, though good shooting had been enjoyed as early as the beginning of that month. By the end of the month birds were plentiful. These were, of course, practically all Swinhoe's snipe and pintails, with but here and there a common snipe.

We very much doubt if there will be anything to record this season regarding pheasant, or duck shooting, unless it be from up the Yangtze, where, as yet, hostilities have not broken out.*

BAMBOO PARTRIDGES IN THE SOOCHOW HILLS.—In response to our appeal for information regarding the bamboo partridges that were laid down in the Soochow Hills area by Mr. A. Hoettler, whose letter appeared in our September issue, we have received the following interesting letter from Mr. M. O. Springfield:—

Shanghai, September 8th, 1924.

To the EDITOR,

"The China Journal of Science & Arts."

DEAR SIR,—Reference Bamboo Partridge in the Soochow Hills, it may interest you and your readers living at Soochow to know that

* Since these notes were written the war in the Shanghai district has come to an end, and sportsmen will probably get some good shooting this season after all.—ED.

whilst hunting the Shanghai Hounds, 1922, 1923 and early this year, strong coveys have flushed from dwarf bamboo clumps usually quite close to some hamlet at the foot of the hills on many occasions. The hills drawn by hounds in pursuit of deer, fox, civet and hare have been those on the right bank of the Mutu Creek commencing with Quarry Hill by Wong Dong Village where the creek branches off to Nine Arch Bridge Pagoda, and ending at Sien Nyung Jao (仙人橋) about four miles short of Kwang Foong. Fifteen to twenty birds usually comprised the covey inhabiting Quarry Hill, whilst in 1922 a covey of, I estimate, nearly forty birds scattered from a fine clump of dwarf bamboo close to Sien Nyung Jao. Later the same day we shot a brace and a half close to where hounds had flushed them in the morning. In 1923 this bamboo clump having been cut down the birds were in a series of bamboo clumps round a hamlet a mile nearer Mutu. Small coveys have flushed at various points between Sien Nyung Jao and Mutu. There are always a fair showing of bamboo partridges in the bamboo copses on the Siccawei Hills when hounds hunt these hills, but I doubt if they would be seen if beaters or a brace of gun dogs were used. In 1915 when hunting hounds outside Haie City, hounds frequently flushed strong coveys, but when one tried to get them out with beaters or gun dogs not a bird rose.

Yours faithfully,

M. O. SPRINGFIELD.

CHAMPIONSHIP CLAY PIGEON SHOOT.—The championship at the clay pigeon shoot held on the grounds of the Shanghai Clay Pigeon Club on Sunday, October 5, was won by Mr. E. H. Himrod with a score of 87 birds out of 100, Mr. W. J. Gande taking second place with 86 birds, and Mr. C. McBain and Mr. Felicani tying for third place with scores of 84 each.

The outstanding feature of the shoot was the inexplicable collapse of Mr. H. H. Read, who was champion last year (with 91 birds out of 100 to his credit), having held this proud position for the past four years. Read's form appeared as good as ever, and the misses that he made were as inexplicable to himself as they were to the onlookers. We trust his present lapse is only temporary.

Himrod was leading at half time, when the competitors adjourned for luncheon, by three birds, a lead which he all but lost in the last twenty birds. Had Gande not fallen down in the last ten birds the results of the shoot would have been different. As it was he gave away three birds. Himrod's shooting this season has been consistently good. Last year he tied with Mr. F. J. Milne for third place with 84 birds.

The shooting on the whole was not satisfactory, though the weather was bright and visibility good. In the morning there was a strong wind blowing diagonally across the field, which, lifting the birds, made shooting very difficult. This accounted for the poor shooting before lunch.

SHOOTING AND FISHING NOTES

Following are the scores in the Championship Shoot :—

Himrod	87	Nazer	81
Gande	86	Moller	78
McBain	84	Morriss	74
Felicani	84	Bates	67
Schwyzzer	83		

Several competitors dropped out before the end of the competition.

A feature of this year's shooting has been the formation of a new club, namely the International Gun Club, three members from which took part in the championship shoot.

Mr. H. E. Gibson, who was second last year with 85 birds, is away on home leave.

After the championship shoot competitors lined up for the Ladies' Nomination Shoot, and the "Joe" Cup Shoot, Mr. A. P. Nazer being the winner.

SHANGHAI MINIATURE RIFLE AND REVOLVER CLUB.—

The attention of newcomers to Shanghai is called to the fact that there is such a club as the above, where instruction in the use of revolvers and rifles may be had. The range is at the corners of Siccawei Road and Route de Say Zoong, and is open daily from 9.30 a.m. to 11.30 p.m. The address of the Secretary, Mr. Thomas Freeman, is Avenue Haig and 2 Route de Say Zoong, and those wishing to join should make application to him. The membership fee is \$10.00 per annum, and includes wives and daughters. Monthly competitions are held, and prizes awarded. The rifle adopted by the club is Vickers' .22 Martini miniature rifle, a very fine little weapon for this kind of shooting.

SHANGHAI VOLUNTEER CORPS' ANNUAL RIFLE MEETING.

—Special interest attaches this year to this competition, which was held on Saturday and Sunday, October 4 and 5, and Saturday and Sunday, October 11 and 12, in view of the fact that the volunteers have been called out in order to meet any contingency that might arise out of the hostilities that are taking place between rival Chinese factions in the vicinity of Shanghai. Altogether there were six events on the 4th and 5th, the most interesting being the "Section Knock-out Competition" and the "Best Ten Competition." The former was won by "B" Company (No. 1 Section), who beat the Japanese Company (No. 2 Section) in the final. The "Best Ten" was won by the Japanese Company with "B" Company second and "A" Company third. "Section Skirmishing" was won by the Chinese Company (No. 1 Section), "Corporals' Skirmishing" by the Japanese Company, "Sergeants' Skirmishing" by the Customs Company; and "Officers' Skirmishing" by the Japanese Company. The Japanese thus won three out of the six events. On October 12, classes "C" and "D" shot off

their various events, while on the 11th, the naval knock-out competition was won by the team of H.M.S. *Diomedes*.

The meeting was not continued on Saturday and Sunday, October 18 and 19, owing to the situation produced by the war.

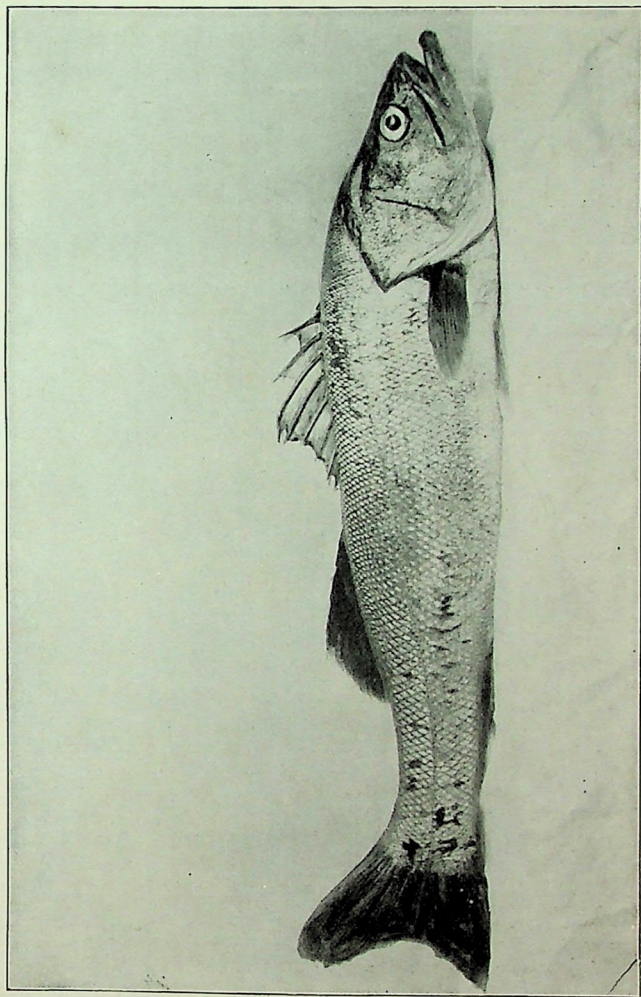
FISHING

TROUT AND SALMON AT CHALUNTUN, MANCHURIA.—A number of Shanghai residents have taken advantage of the exceptionally favourable holiday conditions that prevail at Chaluntun, on the Chinese Eastern Railway, in Manchuria, to spend their vacations in that delightful spot. One of the chief attractions which the various holiday resorts along this railway have to offer is the excellent fishing that is to be had there.

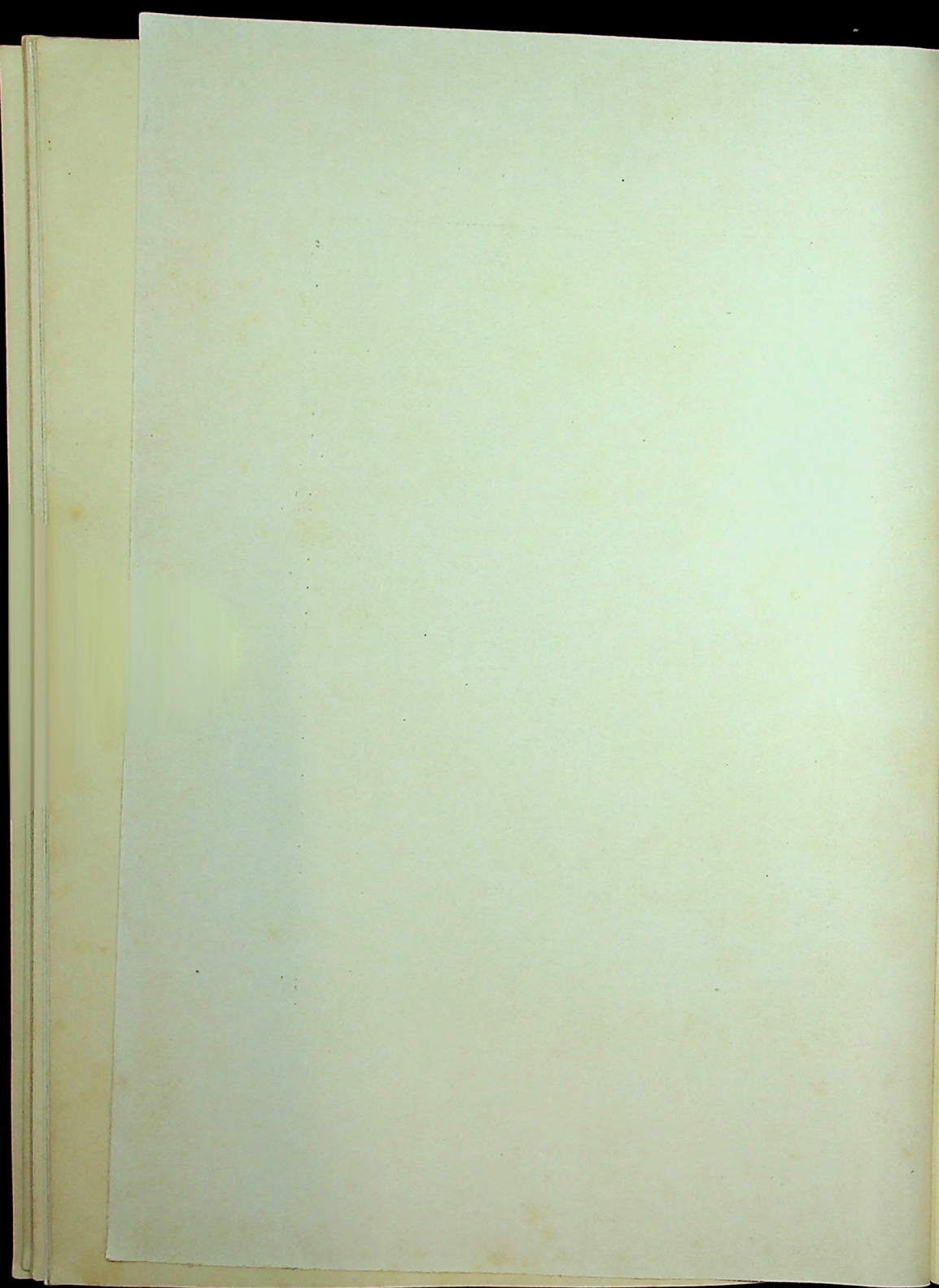
One of our readers reports that while at Chaluntun he both enjoyed and saw others enjoying very good sport with the rod and line. The best fish he saw taken was what the local residents called a salmon, weighing about four pounds. This was about twenty miles north of Chaluntun itself in the beautiful mountain streams that abound in the district. While it is not impossible for the fish in question to have been a salmon, since salmon belonging to the genus *Onchorynchus*—the same as occur in the rivers of the Pacific Coast of North America—do actually ascend the Sungari and Amur Rivers and their tributaries, it is more likely that it was a specimen of one of the many species of char, or hucho (*Salvelinus*), as they are alternatively called, which occur in these parts. The most plentiful fish taken by our informant and his friends were what were called "rainbow" trout. His description of these leaves no room to doubt that they were specimens of the well-known spotted trout of these parts, which is known to science as *Brachymystax lenok* on account of its very wide lipshields or plates. This fish is extraordinarily like the British brook trout, but has no red spots, only black ones. It reaches a large size, sometimes weighing as much as forty pounds. While in the I-mien-po district to the east of Harbin, and elsewhere in Manchuria, we found this fine fish very abundant. Early in May is the best season to take it, when various kinds of "fly" may be used with good effect. In the case of our informant the most effective bait being used at the time of his visit was a red grasshopper. While late spring is the best time for this fishing, the sport may be continued throughout the summer till about September,

Manchuria as a fishing ground is undoubtedly the best that is to be found outside of Japan in the Far East. Besides trout and char, pike, bass, and many members of the carp and catfish families are to be taken.

SEA BASS.—From all accounts the sea bass fishing this season at the North China holiday resorts, such as Peitaiho and Weihaiwei, has



A 7½-lb. Sea Bass (*Lateolabrax japonica*), taken at Wei-hai-wei on a 10½ oz. rod with an "Archie Spinner" baited with a preserved Garfish.



been fully up to its usual standard, while many more foreign residents in China appear to be becoming devotees of the sport.

One of our Shanghai readers who spent his holiday at Weihaiwei reports having had a very satisfying time. Apart from getting plenty of bass of ordinary size, he had the satisfaction of landing the record fish of the season, a splendid specimen weighing 7½-lbs., a photograph of which is here reproduced. This fish was taken off Sun Island with a ten and a half ounce rod on a fine line fitted with an "Archie Spinner" baited with a garfish. According to him, early morning is the best time to get after bass, and they should be fished for from a boat off the rocks. The lure should be cast in the troubled water where the waves are breaking over the rocks. He did not try fly. This visit was during September.

Peitaiho also yielded very good sport. As already reported in our September issue, the best was enjoyed in June, when many fish were landed according to reports. July was not so good and by August it had become almost impossible to catch anything. September saw a return to the better fishing of early summer. According to the natives it is the temperature of the water that regulates the supply of fish, which disappear when the water gets too warm in August.

Fishing at Chinwangtao with cuttlefish as bait near the bottom over rocks, we were able to secure what are locally called rock-bass (*Sebastes inermis*). These are not true bass, belonging rather to the family, *Scorpaenidae*. It is very closely allied to the fish known in Great Britain as the Norway haddock (*S. marinus*). Specimens up to eight or ten pounds may be taken, but, owing to the fact that this fish always makes for the shelter of the rocks, whence it is impossible to dislodge it, large specimens are seldom taken.

We secured a few specimens of a wrasse that is completely new to us, indeed this is the first time we have come across any member of the wrasse family (*Labridae*) in the North China waters. With a general outward resemblance to the basses, the wrasses may be distinguished at once by their small mouths, well supplied with teeth, and their well-developed mobile and soft lips. Our specimens, of a light red-brown colour and variegated markings, were found to be very good eating, though wrasses are not considered so in Great Britain, and are sometimes actually poisonous.

FLY FISHING AT KIUKIANG.—Major Birch, whose interesting letters appeared in our last issue, writes further as follows:—

River Office, Kiukiang,
August 2, 1924.

To the EDITOR.

Perhaps the following additional notes on fly fishing with small trout flies and fine tackle may be of interest.

I have caught between 200 and 300 knife fish with the fly at Kiukiang. The average size was a little over ½-oz. weight each, that is of the

knife fish which swim in shoals, but every now and then one catches them 6 or 7 inches long. I find the tail fly cannot be too small, and the most effective is a tiny Greenwell Glory midge tied on double 000 hooks. The fish take early in the afternoon and then go off rising from about 4 to 5.30. In the evening they come again. Larger knife fish sail into the shallows in the evening from 6 to 7 p.m., but do not take the fly very well.

I have taken one of the other kind of culters on fly up to 11 inches long and 6 ounces in weight. It is very like the knife fish, but has the lower tip of the tail bright scarlet.

I have also taken bream up to 5 ounces or 6 ounces on fly, and, indeed, any of the fish which sail into the shallows late in the evening are well worth casting to. You see the wakes of these fish as they sail about and can put the fly, well sunk, just ahead of the track.

Besides the above you catch slender carp with red fins, and small specimens of the common carp up to $\frac{1}{2}$ -lb. weight. They will, however, only take in quite shallow water, and you have to stand well back and make longish casts to avoid letting them see you.

Two useful flies are the hackle blue upright (rather dark coloured) and a blue hackle with a yellow body. This latter when fished below the surface resembles a nymph and is readily taken by $\frac{1}{2}$ -lb. carp cruising in the shallows. These flies are the Rev. A. Hughes' patterns, and are obtainable from Hardy Bros., Ltd., London and North British Works, Alnwick, England. They are tied from natural cock's hackles and so the hackle is stiffer and better in every way than those from a hen and dyed to shade. They should be a sort of smoky slate colour.

Would you very kindly tell me if the fish of which I sent you a photo is *Elopichthys bambusa*, or is it something else? I find murrel in large lakes here take the fly very badly, but in small weedy ponds they rise much better.

I may add that murrel will take a dead prawn very well at times. The small murrel (*Ophiociphalus*), which are everywhere numerous in July and August, are sometimes taken on quite a small trout fly. I got one last night on a blue hackle and yellow.

Yours very truly,

PERCIVAL LEE BIRCH.

CARP IN SHANGHAI.—Shanghai anglers have at last been successful in their attempts to capture the lordly carp. Mr. L. W. C. Lorden caught his first large carp with bait made up of paste and bran early in October in the pond which the Shanghai Angler's Club has rented. Subsequently he gave a demonstration to a number of other members of the club, taking out seven fish weighing 8 $\frac{1}{2}$ -lb., 7 $\frac{1}{2}$ -lb., 5 $\frac{3}{4}$ -lb., 5 $\frac{1}{2}$ -lb., 5 $\frac{1}{4}$ -lb., 2 $\frac{1}{2}$ -lb. and 1 $\frac{3}{4}$ -lb., respectively. Mr. W. A. Ogden also caught a ten pounder. It is hoped to publish further details in our next issue.

COHESION AS A PHYSICO-CHEMICAL PROBLEM

BY

H. CHATLEY, D.SC.

The causes of the cohesion of matter have long presented a problem which has still not arrived at a complete solution. It has, however, become abundantly clear that the principal factors are those same electrical forces as cause chemical combination.

Cohesion may be measured roughly by tensile strength, hardness, melting temperature or latent heat of fusion, but all of these involve an alteration in the test piece which modifies the conditions. Tensile strength, the most obvious measure, cannot occur without expansion and consequent separation of the particles and only represents the *excess* of cohesion over repulsion for the particular strain involved. At rupture it is only a fraction, say 25 per cent., of the normal cohesion. Cohesion of a feeble character than occurs in solids may be traced also in fluids where it appears as a computed "molecular pressure," which must be added to the actual external pressure to make the fluid conform to the "gas-law," after allowing for the almost irreducible volumes of the molecules.

The writer has found it convenient to employ as a measure the *force* which appears to be exerted between two atoms (or molecules) "in contact." This force is from 10^{-8} to 10^{-3} dynes.*

Modern research has shown that an atom consists of a nucleus carrying a positive charge, surrounded by a number of electrons totalling an equal negative charge, the said number being the "atomic number" of the element concerned.

In the substances of the lowest order of cohesion, the electrons are symmetrically arranged in such a way that the structure is highly stable and cannot be modified by any ordinary method of subtracting or adding electrons. The atoms are "inert" or zero-valent and are as follow:—

Name	Atomic Weight	Atomic Number	Surface Electrons	Absolute Melting Temp.†	Coefficient of Molecular Pressure	Latent Heat of fusion Cals. per gm.-atom
Helium ..	4	2	2	1.15°	0.00005	4
Neon ..	20	10	8	20	?	80
Argon ..	40	18	8	84	0.00259	268
Krypton ..	83	36	18	104	0.00462	330
Xenon ..	130	54	18	133	0.00818	430
Niton ..	222	86	32	202	?	650

*A dyne is the unit of force (about $\frac{1}{10000000}$ gramme weight) which increases the velocity of a mass of one gramme by one centimetre per second.

† Absolute temperature is reckoned from absolute zero and is equal to the centigrade temperature + 273° C.

These substances are all gaseous at ordinary temperatures but the fact that they can be solidified and that molecular pressures do exist indicates that cohesion is present. No chemical combinations are known to occur, and in this case it is supposed that the stray electrostatic and electromagnetic field of the atoms is the cause of it. The forces between pairs of atoms "in contact" vary from 10^{-8} to 10^{-6} dynes (increasing with the number of charges in the atom, *i.e.*, with the field strengths), and probably vary inversely as the fourth power of the distance between the centres of the atoms.

The next class in the order of cohesion is that of the diatomic gases. The outermost electrons of the atoms in these are reputed to be shared in pairs, so forming a dumb-bell molecule with great internal strength and relatively small stray-field. The forces in this case vary from 10^{-7} dynes to 10^{-5} dynes between two molecules in contact and probably vary inversely as the fourth or a higher power of the distance between the centres.

Molecule	Mol. Wt.	Electrons	No. shared	Abs. M.P.	Mol. Pressure
H ₂	2	2	2	14	0.00042
N ₂	28	14	6	63	0.00259
O ₂	32	16	4	46	0.00273
Cl ₂	71	34	2	171	0.01063
Br ₂	160	70	2	266	0.01434

The heats of fusion are from 500 to 2,600 cal. per gram molecule. The effect of the triple bond (6 shared electrons) in N₂ in raising the melting point suggests that in the solid state of that substance a chemical connection with other atoms is established.

Next come more complex molecules which have a rather stronger stray-field due to the great eccentricity and magnitude of the charges. These include most organic compounds, of which many are liquid or even gaseous at ordinary temperatures. The forces in this case between molecules in contact are from 10^{-6} to 10^{-5} dynes.

	Molecule	Mol. Wt.	Electrons	Valency Electrons	Abs. M.P.	Mol. Pressure
	CO ₂	44	22	16	216	0.00717
	CS ₂	76	38	16	157	0.02316
(Benzene)	C ₆ H ₆	78	42	30	278	0.03726
(Aniline)	C ₆ H ₅ NH ₂	93	50	36	267	0.05282

All the above classes are electrically neutral and form stable structures which can only with difficulty be "ionized." Because of this neutrality the cohesion is only due to stray-field and fluid states easily occur.

The next class is that of ionic compounds, in which electrons have been shifted from one atom to another leaving a symmetric but charged atom in each case resembling in structure that of the "inert" atom of the nearest atomic weight. In this case the electrostatic action between the atoms causes a very strong bond and consequently a solid state up to high temperatures. The forces in this case are from 10^{-5} to 10^{-4} dynes

COHESION AS A PHYSICO-CHEMICAL PROBLEM

and vary inversely as the square of the distance between the centres of a pair of atoms.

Example :

Molecule	Mol. Wt.	Electrons	Melting Point	Resembles in Structure
LiH	8	4	high	2 He
NaF	42	20	1253	2 Ne
KCl	74.5	36	1045	2 A
RbBr	165.4	72	956	2 Kr
CsI	260.0	108	894	2 Xe

This table shows decrease of cohesion with constant charges and increasing volumes.

				Valency
2Ne	40	20	20	0
NaF	42	20	1253	1
MgO	40.32	20	2173	2
AlN	41.11	20	high	3
SiC	40.30	20	2973	4

Here is seen the increase of cohesion with increase of charge and constant volumes.

Lastly there is the case where the atoms have such a number of surface electrons that pairs may be shared with more than one other atom, so forming a continuous structure or crystal with special bonds between all neighbouring atoms. Diamond is the best example of this as a carbon atom has four surface electrons all of which it can share with other carbon atoms. Hence the culminating hardness and high melting point (3873°). The bond in this case is about 10^{-3} dynes. Similar bonds occur in hard steels, which in wire may have tensile strengths of 30 tons per square centimetre, which work out to a rupture bond of about 4×10^{-5} dynes per atom, and an equilibrium value of over 10^{-4} dynes.

The effect of additional atoms on the bond between two appears to be quite small, but the strength of the atomic structure as a whole is absolutely dependent on the arrangement, and it is quite certain that great increases in strengths of materials may be expected from improved methods of aggregation.

SCIENTIFIC NOTES AND REVIEWS

STUDIES ON SCHISTOSOMIASIS JAPONICA. A monograph by Ernest Carroll Faust, PH.D., Associate Professor of Parasitology, and Henry Edmund Meleney, M.D., Associate in Medicine, Peking Union Medical College, with a "Supplement on the Molluscan Hosts of the Human Blood Fluke in China and Japan, and Species Liable to be Confused with Them," by Nelson Annandale, D.Sc., Director, Zoological Survey of India. Published as monograph No. 3 by The American Journal of Hygiene, Baltimore, Maryland, U. S. A., March 1924. 339 pages, 36 plates, 25 text-figures.

In this monograph on one of China's most important endemic diseases the authors have gone over the entire field of the biological and clinical features of the problem, reviewing work previously done by the Japanese and other investigators and adding points not previously recorded.

Historically the Japanese have done by far the greater part of the original investigation on the parasite *Schistosoma japonica*. Katsurada first discovered this trematode exactly twenty years ago. The names of Fujinami, Miyagawa, Tsuchiya, Miyairi and Suzuki, and many other Japanese workers are associated with the advance of the problem. The demonstration of the skin as the portal of entry, the path taken by the worm in the body of the host, the difference between the embryo escaping from the egg and the larval form infecting the mammal host, and finally the discovery of the molluscan intermediate host are among the finest pieces of scientific work done in Japan. The pathology of the disease, its treatment and its prophylaxis also had received much attention in Japan.

The present work goes into more detail than any previous publication on the subject, and settles several disputed points. In the section on the biology of the parasite, Dr. Faust has traced carefully the developmental cycle from egg to adult. The development of the larval forms in the snail, and of the adult in the mammalian host, receives special attention. The activities of the miracidial and cercarial forms in their search for their proper host are also described in detail. Finally the determination of the sex of eggs by the chromosomal divisions during spermatogenesis in the testis of the adult male is beautifully demonstrated for the first time.

The fact that the worm travels almost exclusively by way of the blood stream in its migration from the skin to its normal habitat in the mesenteric and portal veins is demonstrated in a series of animal experiments by Dr. Meleney. This point has long been under dispute in Japan.

The pathology and clinical features of the disease are taken up in its three stages. These stages are (1) the period of invasion and maturation of the parasite, (2) the period of egg deposition and extrusion, and

(3) the period of tissue proliferation and repair. Perhaps the most interesting point, biologically, in the section on the pathology of the disease is the demonstration of the method by which the female worm deposits its eggs. Held firmly by the male she migrates into the smallest venules of the inner coats of the intestine, dilating the vessel as she goes but not rupturing it, and finally expelling the eggs *en masse* into the capillaries of the mucous membrane. From this point the inflammation produced by the eggs quickly enables them to reach the lumen of the intestine, to be passed out in the excreta.

In the clinical discussion of the disease, emphasis is placed upon methods of diagnosis, particularly upon accurate examination of the feces for eggs and embryos and upon the use of the blood globulin precipitation test which is valuable also in the diagnosis of kala-azar. The use of tartar emetic in the treatment of the disease is discussed in detail, emphasizing vigorous use of the drug, particularly in early cases.

The public health question created by schistosomiasis is taken up in two sections of the monograph. The first deals with the distribution of the disease in the Orient, and particularly in China; the second with possible methods of prophylaxis. The very wide prevalence of the disease in the Yangtze Valley and along the coast of Southern China as far as Canton, was demonstrated by the answers to a questionnaire sent to all parts of the country. The disease does not exist north of the Yangtze Valley. It is most prevalent in the Soochow-Kashing region and in the lake region of the Central Yangtze. This wide distribution is in contrast to the very limited endemic areas in Japan, and makes the question of prophylaxis a tremendous one. Although several methods of attack upon the parasite are available, and have been used successfully in Japan, they depend upon efficient public health agencies and the co-operation of the farm population, and are therefore difficult of application in China. Educational methods among the farmers are advocated as having the best chance of accomplishing results. Efforts at prophylaxis in China should emphasize the control of feces disposal until embryos of the parasite are dead, avoidance of unnecessary wading in infected water, protection of the skin when wading, and extensive treatment of the disease in hospitals.

Finally, the subject of the intermediate host of *Schistosoma japonica* occupies two important sections of the monograph. In the first the discovery of this host, the snail *Oncomelania hupensis*, in the regions of Soochow and Kashing in China is recorded, together with the discovery of the presence of *Katayama nosophora*, in lower Chekiang and in Kwantung. The latter is the snail which acts as the intermediate host of this parasite in Japan. The second section devoted to the intermediate host is an *Appendix* by Nelson Annandale, Director of the Zoological Survey of India. He discusses the practical points upon which the diagnosis of the genus *Oncomelania* depends, and gives the taxonomy of the subfamilies *Trichulinæ* and *Pomatiopsinæ*, to the former of which the *Oncomelania* belong, and to the latter of which the *Blanfordia* belong, a genus which has erroneously been regarded as the intermediate host of *Schistosoma japonica* in Japan.

The monograph is copiously illustrated by excellent plates and text-figures, which are of great credit to the editors. There is also a complete bibliography of the subject containing 364 references to medical literature.

The volume is appropriately dedicated to Dr. Henry Spencer Houghton, Director of the Peking Union Medical College, "who, as a former medical missionary at Wuhu, Anhwei Province, China, undertook the first scientific study of schistosomiasis in China."

LOWER CRETACEOUS FORMATION IN SHANTUNG. The recent discovery of rocks of the Cretaceous period first by the Third Asiatic Expedition in Western Mongolia, and subsequently by Mr. H. C. T'an of the Government Geological Survey in Shantung, filled in a big gap in the history of Central and Eastern Asia. Previously the Cretaceous Formation was not known to occur in Asia north of the Himalayas. The importance of these discoveries cannot be overestimated, as they throw a flood of light upon the difficult subject of the distribution of faunas, past and present, over the surface of the globe. The Mongolian discoveries prove beyond question that the great dinosaurs whose remains have been found in such numbers in North America had their origin in the plateau of Central Asia. With this phase of the subject our readers will by now be fairly familiar.

The significance of Mr. T'an's discoveries of rocks of the Lower Cretaceous—that is to say of an earlier date than the Cretaceous of Mongolia—is, if anything, even greater. What appears to be the most important find is that of a fossil beetle, so close to the present day scarabæids as to leave no doubt that it represents their ancient ancestor. There are a number of problems in connection with the distribution of certain forms of animal life in China, which the presence of Cretaceous rocks in the country may help to elucidate. The species specially in mind are the Yangtze alligator (*Alligator sinensis*), the giant salamander (*Megalobatrachus japonica*), the peculiar ganoid, the slender-beaked sturgeon (*Psephurus gladius*), and the Fukien katy-did (*Atlantiscus palpalis*). Of these the Yangtze alligator is the only member of the genus now found in the Old World, the only other members being confined to the waters of the Mississippi and Florida in the south-eastern United States: the nearest relative of the giant salamander, the so-called hell-bender (*Cryptobranchus lateralis*), is also confined to the Mississippi basin, as also is the nearest relative of the slender-beaked sturgeon, namely the spoon-beaked sturgeon (*Polyodon folius*). The Fukien katy-did is the only Old World representative of a genus of grasshoppers whose distribution elsewhere in the world is confined to the eastern United States and neighbouring parts of Canada. All these forms date back at least to the same period of the earth's history as that of the recently discovered fossil beetle of Shantung, and it is not too much to suppose that in Cretaceous times there was some connection

between this part of the globe and that now occupied by the eastern United States. It remains for geologists to work out the details.

SEX RATIOS OF BIRTHS IN CHINA. Under the auspices of the China Medical Missionary Association Dr. F. Oppenheim's paper dealing with the above subject which appeared in our September issue has been reprinted and distributed with the October number of the *China Medical Journal*, together with an enquiry form with a view to obtaining further data. Dr. Oppenheim is very anxious to secure as much data in regard to this interesting question as possible, and all who are in a position to help supply it are requested to apply to him, care of the China Medical Missionary Association, 23 Yuen-Ming-Yuen Road, for enquiry forms. Information concerning the birth of even one Chinese child will be useful, provided it is from the personal observation of the European who supplies it.

SOCIETIES AND INSTITUTIONS

THE CHINA SOCIETY OF SCIENCE & ARTS

ELECTION OF OFFICERS FOR 1925.—The election by ballot slip of the officers for the above Society resulted in the return of those who served last year as follows :

President : Arthur de Carle Sowerby
Vice-Presidents : John C. Ferguson, PH. D. (Arts)
Herbert Chatley, D. SC. (Science)
Committee : Mary A. Mullikin
J. G. Andersson, PH. D.
Wu Lien Teh, M.D., D.S.
C. R. Kellogg (Prof.)
Geo. D. Wilder (Rev.)

Mr Verne Dyson having resigned the secretaryship of the Society, Miss N. L. Horan has kindly agreed to accept this position.

Miss Clarice S. Moise continues to act as Honorary Treasurer.

In addition to the above the following officers of the various sections will continue to serve :—

Literary & Sinology Section : Dr. John C. Ferguson, *Secretary*.

Art Section : Mrs. H. A. Swan, *Secretary*.

Biology Section : Professor C. R. Kellogg, *Secretary*.

Chemistry and Physics Section : Dr. H. Chatley, *Secretary*.

Medico-Biological Section : Dr. Eugene Peck, *President*.

Prof. W. M. Porterfield, *Secretary*.

LECTURES.—Details of the program being arranged for this season's lectures will be issued in due course. The following have promised lectures : Mr. A. de C. Sowerby, Miss C. S. Moise, Dr. H. Chatley, Mr. P. L. Bryant and Prof. W. M. Porterfield.

THE QUEST SOCIETY

On Monday, October 13, the Quest Society held its first meeting of the season, in the R. A. S. Lecture Hall, 5 Museum Road, Shanghai, at 5.30 p.m. Dr. H. Chatley gave an interesting lecture on "The Planet Mars." After the discussion which followed, a short business meeting was held to pass the Honorary Treasurer's report, and to elect officers for the coming season. The officers elected were :

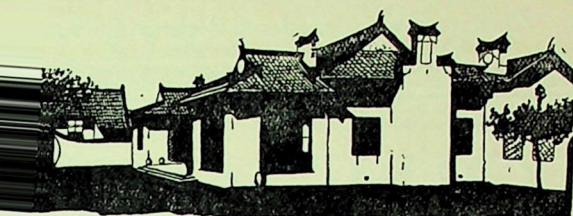
Chairman : H. Chatley
Vice-Chairman : A. J. Hughes and A. R. de Jonge
Treasurer : S. W. Wolfe
Secretary : S. Sudka

BOOKS AND PERIODICALS RECEIVED

- Discovery : Vol. 5, No. 52, May, 1924.
- The New Orient. Published by Orient Society : Vol. II, No. 1, May-June, 1924.
- The Philippine Journal of Science : Vol. XXIV, Nos. 4, 5 and 6, April, May and June, 1924. Vol. XXV, No. 1, July, 1924.
- French Colonial Digest : Vol. II, Nos. 7 and 8, June and July, 1924.
- Chinese Economic Bulletin, compiled and published by the Chinese Government Bureau of Economic Information : Nos. 167 to 184, May, June, July and August, 1924.
- The New Zealand Journal of Science and Technology : Vol. VII, No. 1, May, 1924. Wellington, N. Z.
- Le Revue Economique d'Extreme Orient : Premiere Anne, No. 1, 25 Mai, 1924.
- Psyche : Vol. 4, No. 4, April, 1924 ; Vol. 5, No. 1, July, 1924.
- Mid-Pacific Magazine : Vol. XXVII, No. 6, June, 1924 ; Vol. XXVIII, Nos. 1, 2 and 3, July, August and September, 1924.
- Natural History : Vol. XXIV, No. 2, March-April, 1924.
- The Comparative Oologist and Journal of the International Museum of Comparative Oology. Santa Barbara, Calif. Vol. 1, No. 1, May, 1924.
- The American University Courier. Vol. XXX, No. 2, June, 1924.
- North Manchurian Plague Prevention Service Reports 1923-1924. Edited by Wu Lien Teh.
- Le Chine : Vol. 4, Nos. 66 and 67, June and July, 1924.
- The Critical Review : Nos. 29, 30 and 31, May, June and July, 1924.
- Proceedings of the Indian Association for the Cultivation of Science : Vol VIII, Part III-IV.
- The Annals and Magazine of Natural History : Nos. 73 to 79, January to July, 1924.
- Bulletin of the Pan-Pacific Union : New Series, Nos. 57, 58 and 59, July, August and September, 1924. Extra Bulletin, July 31st, 1924.
- Growth of Chinese, by S. M. Shirokogoroff and V. B. Appleton.
- French Colonial Digest : Vol. II, No. 6, May, 1924.
- China Weekly Review : Vol. XXIX, Nos. 9, 10, 11, 12 and 13, August, 1924.
- Science : December, 1923, January, 1924.
- Asia : Vol. 24, Nos. 6 and 7, June and July, 1924.

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- Asiatic Motor: Vol. III, Nos. 6, 7 and 8, June, July and August, 1924.
Far Eastern Review: Vol 20, Nos. 6, 7 and 8, June, July and August, 1924.
Transactions of the Science Society of China: Vol. II, 1923.
Bulletin of the China Chemical Society.
The International Journal. Published by the International Institute of China, Inc., Peking.
Agriculture and Forestry Notes, College of Agriculture and Forestry, University of Nanking: Vol. I, Nos. 8 and 9, May and June, 1924.
The American Journal of Science: Vol. VII, No. 42, June, 1924; Vol. VIII, Nos. 43 and 44, July and August, 1924.
Gow's Guide to Shanghai, 1924. Price \$1.00.
Canton Christian College: Bulletin 36, Announcements for 1924-25.
The Sanskrit Drama. By A. Berriedale Keith, D.C.I., D. LITT., Oxford University Press. Price 21/-.
Cheloo Papers. Being a selection of addresses delivered at Shantung Christian University, Tsinan, China.
The Modern Review. Edited by Ramanada Chatterjee. Vol. XXVI, No. 1, July, 1924.
Bibliography of Chinese Literature on Agriculture. Compiled by Mao Yung. Published by University of Nanking.
Lloyd's Weekly and Shipping Review. Vol. VI, No. 32, August 16, 1924.
The Lingnaam Agricultural Review. Canton Christian College, Vol. 2, No. 1, July, 1924.
The Chinese Social and Political Science Review. Vol. VIII, No. 3, July, 1924.
Memoirs of the Geological Survey of China. Series A, No. 2, December, 1923. Part II. By F. R. Tegengren.
Bulletin du Museum National de l'Histoire Naturelle.
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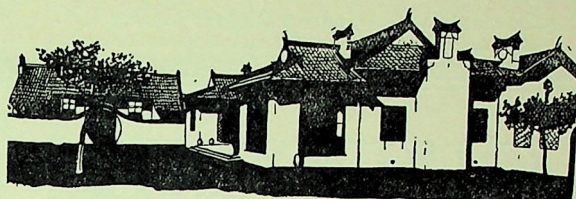
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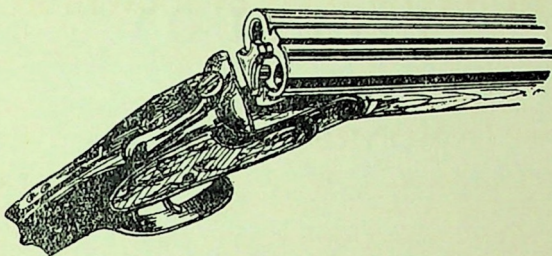
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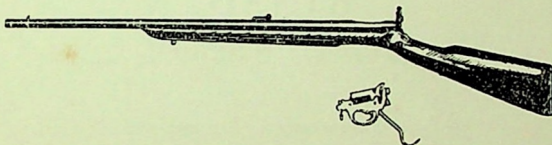
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