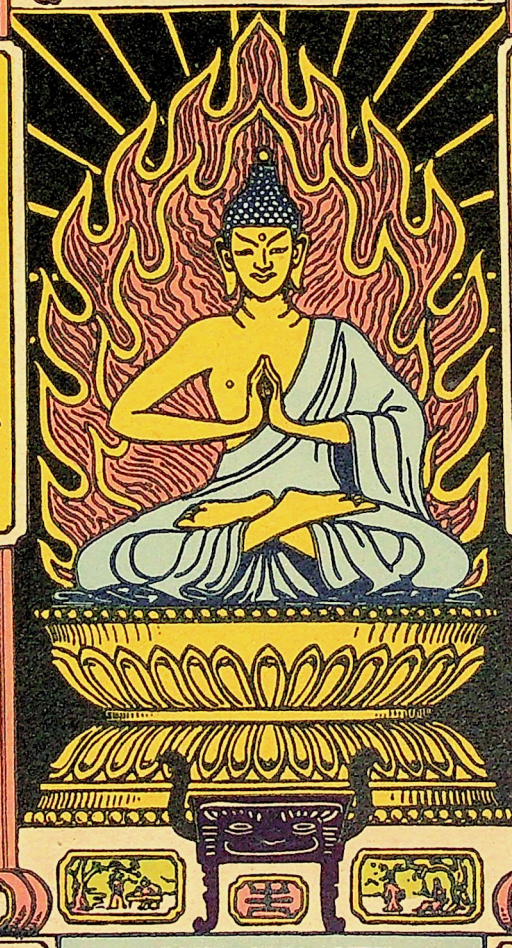
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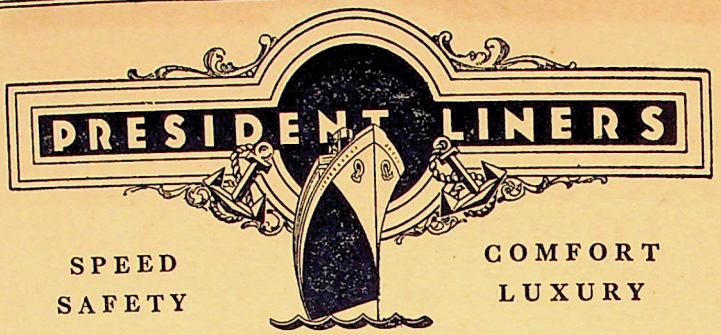
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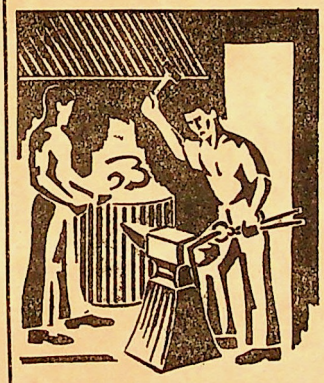
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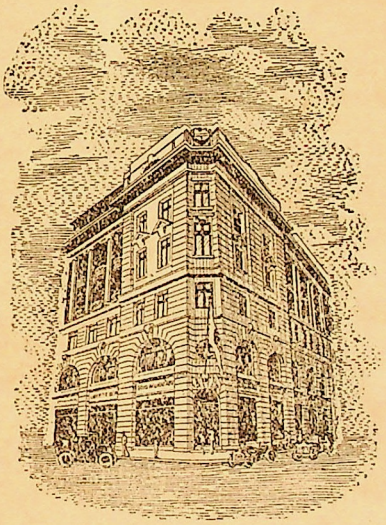
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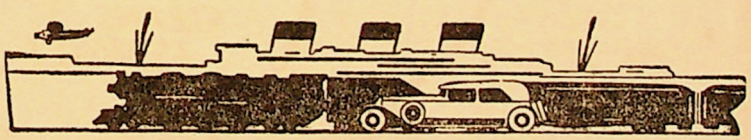
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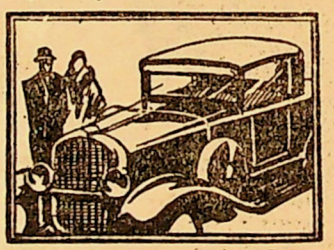
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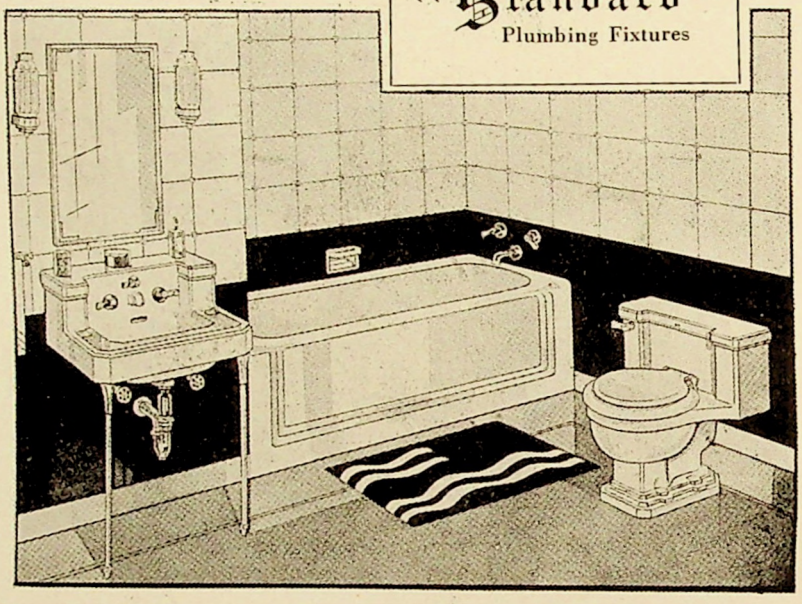
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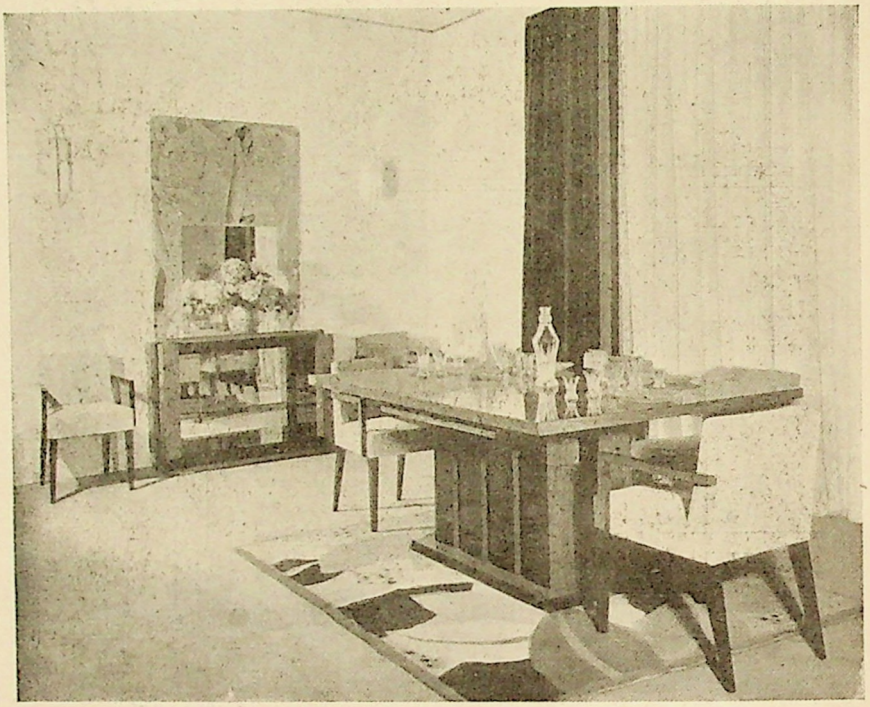
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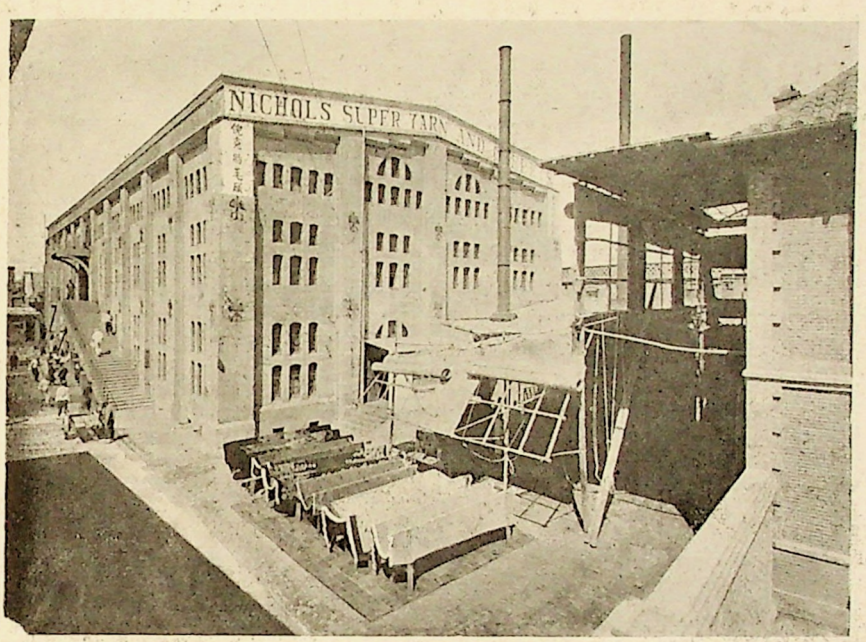
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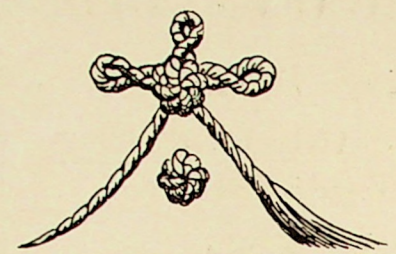
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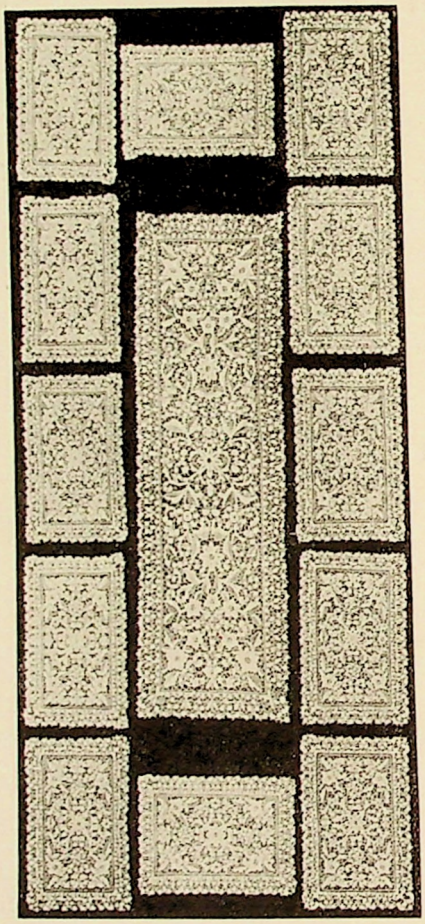
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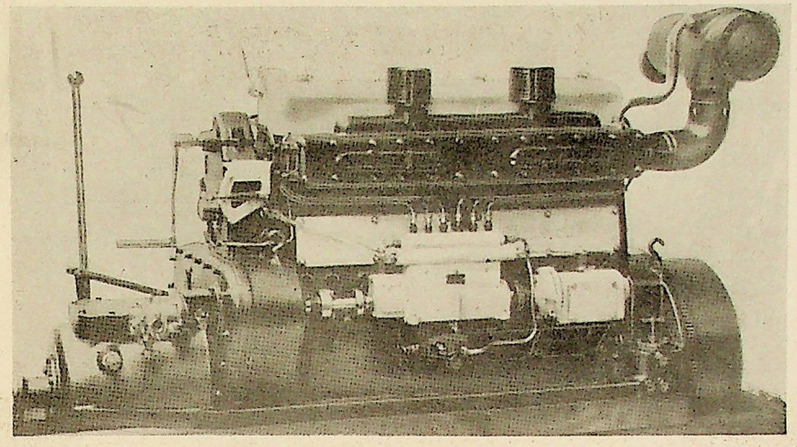
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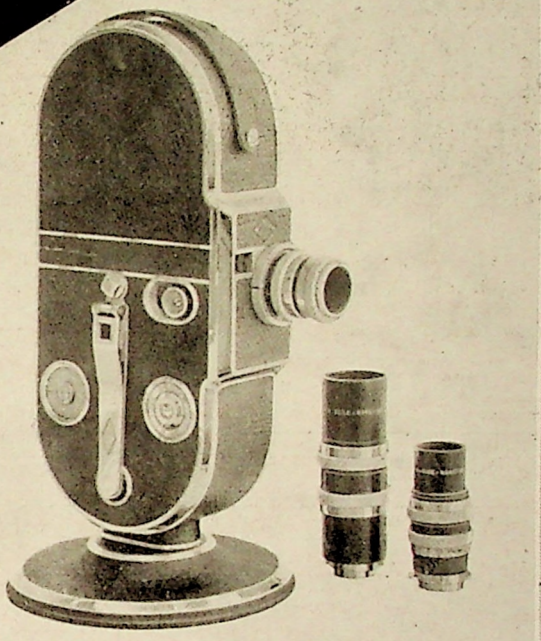
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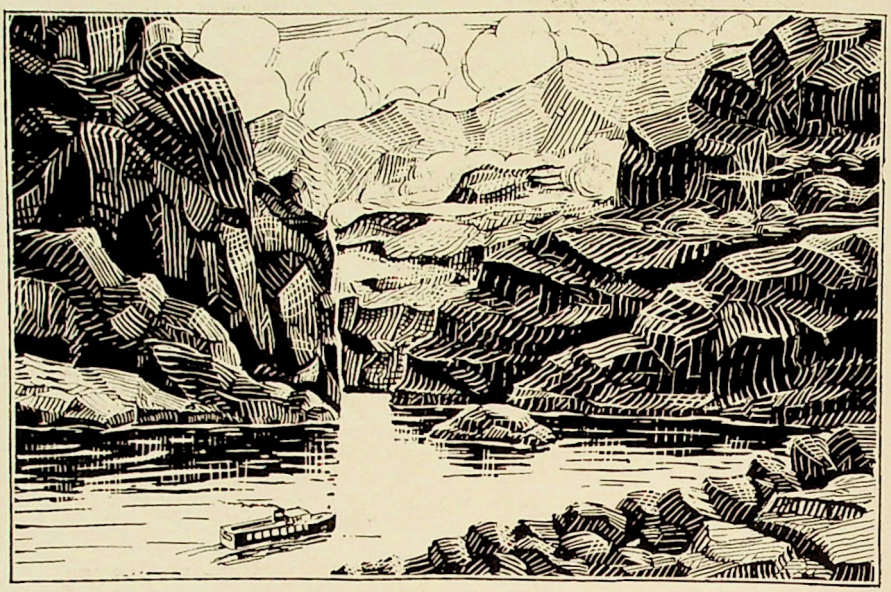
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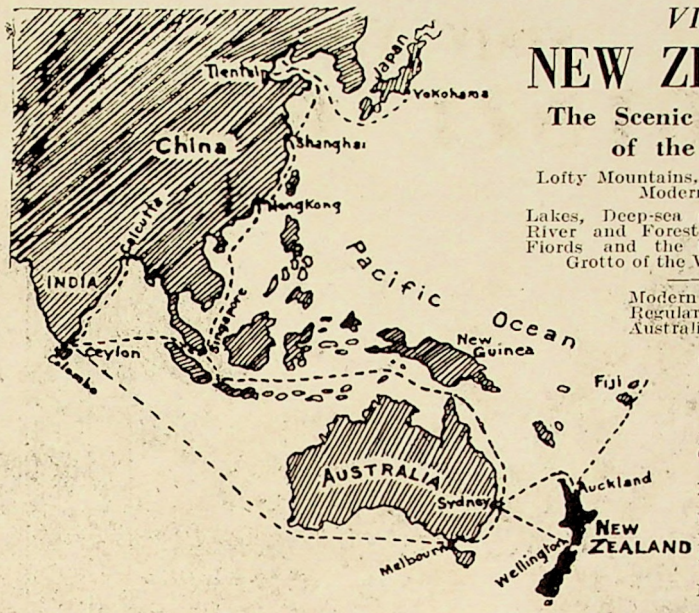
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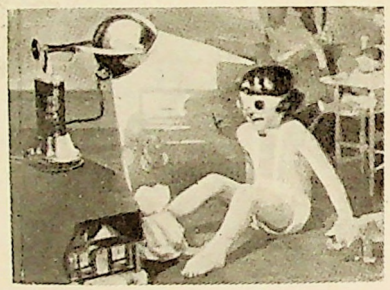
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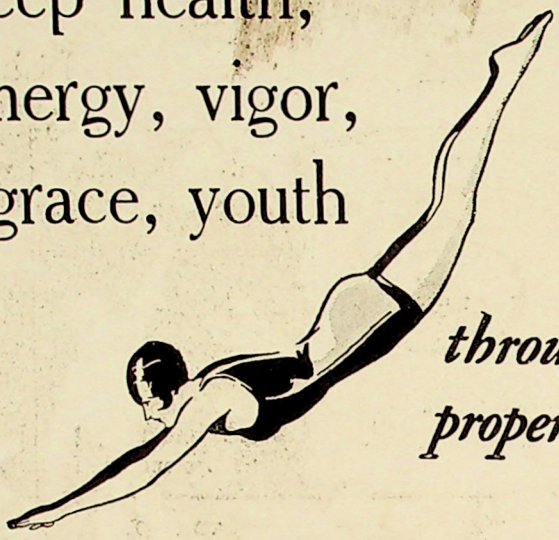
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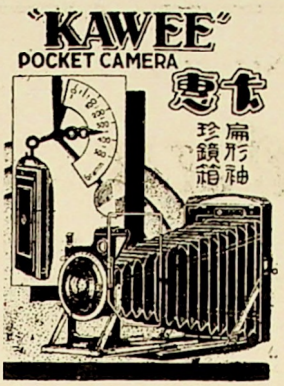
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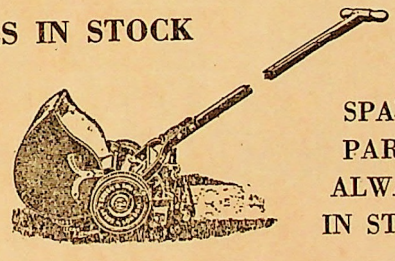
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IN THE DAYS OF THE OLD CHINA TRADE

From the Oil Painting by Carolina Barradas.

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CHINA AND THE WORLD

BY

ARTHUR DE C. SOWERBY

Great events have been taking place of late, events which must have the most far reaching effects upon the welfare of the peoples of all nations. The world at last seems to be successfully struggling out of the political and economic quagmire into which it sank after the Great War. The policy of drift appears to be at an end, and the leaders of the different countries are honestly and diligently seeking ways and means of bringing things back to a normal level of prosperity. Each country has its own particular methods.

Russia, with her vast Union of Soviet States extending across Asia to the Pacific, is trying a monstrous experiment in Communism. Italy has made great strides with Fascism, which is just the opposite to Communism. Germany has recently decided to follow the same political paths as Italy. Great Britain has abandoned her system of Party Government for one of National Government, while the United States has replaced the Republicans with the Democrats and has put unprecedented powers in the hands of the High Executive of the land, almost making him a Dictator.

All these are drastic measures to meet a desperate situation ; and, on the whole, the results seem to be justifying the action taken in the different countries. Italy has been re-born ; Great Britain's prosperity is returning ; despair has given way to a great hope in America ; Germany is again becoming a strong and united nation, In short, the West appears to be recovering from the terrible economic depression and political chaos that followed the post-war boom ; for the West has waked in time to the doom that was threatening the very foundations of its

civilization, and great men have risen and great minds striven to lead the people back to stability and sanity. Important movements are afoot to bring about better conditions in the world as well as in the individual nations—the Disarmament Conference, for instance, and the even more important Economic Conference. There are those amongst the world's great ones who are able to think in terms beyond mere patriotism; who realize that world unity and international cooperation alone can save mankind from ultimate disaster; who see that wars, whether conducted with military or with economic weapons, guns or tariffs, must cease, if the human race is not going to destroy itself. More power to these, and may their efforts be crowned with success.

* * *

While the civilization of Europe, which finds its ultimate expression in the United States of America, has been struggling back from chaos and threatened dissolution to stability and cohesion, things have not been going too well in Eastern Asia and the Pacific, mainly, it must be admitted, as a repercussion of events in the West.

In the first place the economic depression that has had such a disastrous effect in Europe and America has been felt more or less keenly in the Far East.

The serious falling off in the export trades of China and Manchuria cannot be entirely or even mainly attributed to internal disorders and such catastrophes as famines and floods. Had the European and American markets for the raw products, such as wool, cotton, skins, hides, vegetable oils and beans, remained strong, these products would have been forthcoming, And, of course, a decline in exports has meant a decline in imports. Japan, a manufacturing country, has also been seriously affected by the depression, and, indirectly, this must have had its bearing upon that country's policy in the Far East. She could not afford to let her markets on the Asiatic mainland disappear, which has meant that the Chinese boycott of her goods has been a much more serious matter than it would have been if she could have sold her products elsewhere. The Netherlands Indies and the Malay regions generally have suffered very seriously from the depression in Europe and America, since these countries are essentially producers of raw material and agricultural products—oil, tin, rubber, sugar, coffee and fibres.

In the second place, the political upheavals in Europe, and the difficulties in which the various Governments have found themselves as a result, have had their effect on political matters and international relations in the Far East and the Pacific regions. Thus to-day, although not declared as such, a war is in progress between Japan and China, while other undeclared wars are taking place in the South American continent. War is also threatening between Soviet Russia on the one hand and Japan and Manchoukuo on the other as a result of the dispute over the Chinese Eastern Railway.

* * *

What is the root of all this trouble and misery? This is a question that may well be asked.

And, significantly enough, the fundamental cause, when we come to consider it, is that which has always produced misery and distress and world upheavals. It is the economic problem ; how to get enough to eat and how to protect oneself from cold or heat, as the case may be ; how to provide for the necessities and comforts of one's family. This problem harassed the minds of our forebears of the very earliest stages of man's existence as much as it exercises ours to-day. This economic urge, as it has been aptly called, has been the mainspring of all man's activities from the Palaeolithic or Old Stone Age of a million or more years ago to the Machine Age of to-day. It was responsible for the extermination of successive races of primitive man in Europe, as others with more efficient weapons invaded their territories for the sake of the food animals they contained. It caused the invasion of the early centres of civilization by hordes of savages, the destruction of Babylon and the overthrow of the first dynasties of Egypt. It brought about the world conquests by the Greeks, the Romans, the Huns and the Mongols. It inspired the destruction of Carthage at the hands of the Romans, and the sack of Rome by the Goths. It sent the Vikings scouring the North Sea and the neighbouring Atlantic Ocean, the sea wolves that harried, pillaged and burned along all the western coasts of Europe. It, not religion, as is generally supposed, caused the Arabs to surge westward across North Africa to Spain and eastward through India to the Malayan Archipelago, and north-eastward to the borders of China. It was responsible for the voyages of Hanno, of Columbus, of Magellan, of Cook and of the thousands of explorers and pioneers that have made known the world and its resources to civilization. Because of it the Chinese of the Han Dynasty found a way through the dreary wastes of Central Asia to sell silk to the Romans. It colonized the Americas, Africa and Australia. To it was due the opening of trade relations between Europe and China in the early days of the Ch'ing or Manchu Dynasty.

It was behind the policies that led to the World War in 1914, and to-day it is still the great motivating force of our individual and national lives. It is back of Japan's recent actions in the Far East. It is the cause of all the political unrest in the West. Its solution in the best interests of mankind as a whole is the first and foremost task confronting the leaders of the different countries at the present time.

Thus it is that the world is ready to welcome the forthcoming Economic Conference that has been scheduled to open on June 12 in London, when over two thousand delegates from all parts of the world will meet with the object of putting the affairs of the nations on a sound economic basis. Until this is done, there is not much use in trying to do away with armaments, for armed force is still man's last resort in his determination to satisfy the economic urge.

* * *

The task before the Economic Conference is no small one, and while the time of its duration has been variously estimated at from two to six months it is not to be supposed that it can accomplish everything necessary in that time. However, a great deal can and should be done immediately.

And at the outset it may be suggested that the Conference give a great deal more attention to the countries of the Far East and Pacific region generally and their needs than has been given heretofore. Europe and America do not appear to realize the importance to them of the countries of this vast region, whose aggregate populations exceed by many times those of the rest of the world put together, whose buying power is enormous, whose potentialities for good or ill are beyond man's reckoning. Peace and prosperity in this area are essential to the peace and prosperity of the rest of the world. The world's biggest markets lie here, and here, too, are produced the greater part of the world's raw materials in many directions.

* * *

But first the Conference must put the world's financial system right, for money is to the world's trade what the fluid of the blood-system is to the human body. It is the means by which the ownership of commodities and articles is transferred from producer to consumer, and if there is not enough of it, or if it gets blocked in the channels and does not flow easily and steadily, trade ceases and disaster ensues. A shortage of currency or its concentration in any given country, which is the inevitable result of fluctuating exchange rates, is as bad for the world as cholera, which depletes the blood-system of its fluid, or pneumonia, which causes a congestion of blood in the lungs, are for the human body.

Stabilization of the world's currencies is necessary, and since there is, by no stretch of imagination, enough gold to go round, silver must be rehabilitated as currency, at least till something better in the way of a credit system has been devised to take the place of the present money system. The increased buying power alone of the 475,000,000 Chinese that would result if this were done would repay the effort on the part of Western nations to bring it about.

* * *

That some very drastic reform is needed in our present financial system is evident. Much of the best directed thought of the day is being concentrated on this problem, and many theories and solutions offered.

Technocracy, recently revived in the United States of America, may be dismissed at present, since its proponents have obviously not yet arrived at a definite solution. No doubt some day the world will be ruled by its technologists, but it is not yet ready for anything so drastic.

The Douglas System of Social Credit seems to offer a better solution, and is certainly worth studying.

What is certain, however, is that, if the world is to be saved from a colossal financial crash in the near future, something must be done to solve the problems of war debts and payments. Tariff wars must be eliminated and means must be found of promoting a free flow of articles and commodities from producers to consumers regardless of political or national boundaries.

Such ideas as national buying must be discouraged. A lot has been heard recently on this score. " Buy British ! " is a slogan that has reverberated round the world, even reaching China. " Buy Chinese!" comes the answer, which is exactly what was to be expected. And where has British industry benefitted ?

Reciprocal trade agreements should be encouraged in order to eliminate unfair competition, and adjustments must be made between countries with high and low wage standards so that neither shall suffer unduly or unfairly.

* * *

Meanwhile consideration should immediately be given to the present unsatisfactory state of world politics. This is, no doubt, rather outside the scope of the Economic Conference, and not quite within that of the Disarmament Conference. It might well be considered by the two jointly, however. The League of Nations, which was the instrument devised by Western countries to prevent war, while so far successful in Europe, has proved a failure in the Far East and South America. Indeed, it is thought by some to have been in some degree responsible for the Sino-Japanese imbroglio ; since, but for the belief in its power to intervene effectively that had been engendered in the minds of the belligerents, it is doubtful if things would have been allowed to go as far as actual hostilities. The truth is the League of Nations was primarily designed for Europe and Occidental countries ; not for Oriental Countries and the Pacific. As has been pointed out in a recent book Japan has found that she does not need the League of Nations. Had the United States of America been a member it might have been different. It might have meant much more to countries whose sole interests lay in the Pacific. It might have been more helpful in maintaining peace in this region. Japan would have been more loath to withdraw from it. It is possible, too, that the countries of South America would have shown greater respect for it if their powerful northern neighbour had been a member. This, of course, is problematical, but it may well be argued that the League of Nations without the United States of America, possibly the most powerful country in the world, is not strong enough to control and direct the destinies of the world. The peace and prosperity of the world can only be assured by a League of *All* Nations with the power and determination to enforce the carrying out of its decisions. Geneva could well be its main headquarters, but there should be at least two other centres, one in the Far East, say in the International Settlement of Shanghai, and the other somewhere in Central America, which could immediately investigate disputes between any two states in their respective regions. The Sino-Japanese imbroglio in Manchuria showed clearly that Geneva was too far away to be effective. A commission of enquiry and conciliation sent from Shanghai immediately on the outbreak of trouble would undoubtedly have localized it and brought the matter to a peaceful issue.

The astonishing thing to-day is that no real effort, apparently, is being made by Western nations to bring about negotiations between

China and Japan for a peaceful settlement of the present trouble. What are the Western countries doing ? If ever there was a call from distressed countries it is now. Is this fight to be allowed to go on till it embroils the whole world ? A very serious warning that such is the danger may be given here in the hopes that it will reach the right quarters and call forth the necessary action. " Give us peace in our time, Oh Lord ! " is our prayer : but peace must be sought. It must be worked for ; enforced, if necessary. Only in an atmosphere of peace can the world regain its economic equilibrium.

* * *

In the following pages of this special " Economic Number " of our journal we have attempted to present China's economic position in relation to the rest of the world, and to give our readers, especially those in foreign countries, some idea of her natural and industrial resources, finances and trade. The subject, of course, is altogether too large to be dealt with in detail ; only the most general outline has been possible in the space at our command. It is hoped, however, that a useful purpose will be served in bringing China's economic importance and her needs as a great people before the rest of the world. If this be accomplished, our purpose will have been well served.

WHAT A REAL DICTATOR WOULD DO

BY

FREDERICKA BLANKNER

This article has been personally read and approved by Premier Benito Mussolini.

" To solve the world problem we must recognize and treat it as such—not as a national problem nor as a collection of national problems, for it is neither. It is a problem concerning the world as a unit, and it must be met with a sense of world unity, world cooperation and management not heretofore sufficiently present in the international parleys. It must be solved with simplicity, honesty and decision—with spirituality instead of materialism. And it must be met with the viewpoint of to-morrow."

It is Mussolini speaking in Palazzo Venezia, Rome, in the great Sala del Mappamondo that is his study. Across that massive desk of his upon which have been drawn the solutions of the Italian problems of the past decade, in a series of conversations, I am asking the Italian Premier, creator of the Corporative State, what would be his solution of the problems of the world—what he believes is wrong with the world, how in his judgment government can best help business, how he would adjust capital and labour, what in his opinion should be done to meet the present crisis and to avoid depressions in the future. In its economic, political and social uncertainty, in its provincial insularity, the world to-day is not unlike the Italy before the march on Rome. The problems

to-day confronting many other nations and the world, in kind, are not unlike the problems that were given into Mussolini's charge in 1922, when he was made Italy's Prime Minister.

" The world is already entering upon to-morrow, but for the most part its Governments and its discussions are of yesterday. True, the problems remaining to us from yesterday must be solved before we can advance, but they must be solved with the viewpoint of to-morrow. We keep trying to apply the solutions of yesterday, and they do not fit, for they are too puny and complex for the newer simpler greater world into which we are evolving.

" The present crisis is not a period of alternation within an epoch. It is the beginning of transition to another era. The world is making ready for a new order—it has outgrown the old. Part of the past is dying, much is dead, and the future is being born. The peoples of the world are beginning to awaken to a sense of new values, something new within themselves that has been lying dormant until now. These new values and forces are mainly spiritual. It is the task of the leaders of the world to assist evolution. They must discover what the new forces are, they must be brave enough to discard what is already dead or dying, and to devise systems in which the new is actively substituted for the old. Many of the difficulties with which we are struggling are confusions of the issue and are not the real problem."

" What would be an example ? "

" Perhaps even the problem of peace. Even that may not be so vital as we think it is, peace in the sense we have always interpreted it—political peace between nations. Perhaps the problem of peace already has been solved in the spirit of man, needing only recognition by the world conferences to make the solution tangible and effective.

" Man's wants continue to be the same as they have always been, but he is beginning to realize that he will have to find another way to obtain them. The masses already know the answer within themselves. They realize that it is not by fighting that they can get what they want, but by working—by team-working, in which the United States is so able —that is, by cooperation.

" For the moment," he answers further, " we have the anachronism of national representatives solemnly discussing the technicalities of means of warfare and limitations of armaments in a world where every one wants only to work ! It is another peace, the cessation of another war that is the immediate and vital problem—the cessation of the economic war—in which it is daily becoming more obvious that there can be no victory."

Since in attempting a solution the first essential is to see the problem itself clearly, to " see it steadily and see it whole," I ask, " What is your analysis of the major difficulty that is crippling the movement and, therefore, the life of the world to-day ? "

" I find our civilization to be dual," Mussolini replies, " both economic and political. It is composed of economic elements maladjusted to each other and of political elements maladjusted to each other and to the economic."

"Certain of our elements have outgrown their coordination ?"

"Yes, just as there is, for example, a period of awkwardness during the development of a child's body when nature's energetic building of bones outstrips her coordination of them."

"Then we have at last," I venture, reflecting on his words, "the machine that writers of fiction have been fond of prophesying, a machine grown beyond human control—a system-machine that man made and set going, and at first found to be a true horn of plenty pouring forth for him all the wealth of the world, only to develop it with such energy that it has become greater than he, has acquired a momentum of its own. . . ."

"Exactly . . . and the horn of plenty turns out to be a Juggernaut ! The difficulty is that capitalism has ceased to be an instrument and has become a divinity. The normal has become abnormal. The physiological pathological.

"Man's economic system has grown beyond his mental grasp and, therefore, beyond his control," Mussolini resumes his analysis, "his economic system has become international and has outgrown his economic consciousness, which has remained nationalistic. And on the other hand there is the reverse situation : that his political consciousness has become international, outgrowing his political system, which has remained nationalistic. Herein is the difficulty encountered but not recognized at the peace conferences. By strange anomaly it is his political consciousness and not his economic consciousness that has kept pace with his internationally growing economic machine.

"So, lured by the rich fruits of economic adventuring, man has forgotten to care equally how he is governed ! Seeking control of the external world for material benefits alone, he has let its spirit elude him and, therefore, he has lost it. In his passion to control the world, man has lived too much outside himself, and he has, therefore, lost control of himself, which means that he has lost control of the world. Indeed, he has doubly lost the world that he would gain, for he has lost both the inner world and the outer. We may not so soon again confuse the means with the end. Persistent failure in the stock market has served to teach us that the only investment that is sure of dividends is life.

"However, it is precisely the vastness of this economic reach that has served to bring about an international political consciousness that might otherwise have been delayed.

"The difficulty is that, though man has an international consciousness and an international system, there is lack of adjustment, for one is political and the other is economic. His economic system being greater than his political system, they are no longer geared together. Therefore, parts of the world machine have stopped running and the others are running badly.

"From this inactivity results the depression.

"Man must study the vast economic machine that he has built until he has expanded his consciousness to grasp it. He must study the economic relationships that have developed, stretching across mountains, across oceans, even around the earth—economic States whose antipodes are linked as vitally as New York's suburbs are linked with

New York : the territories that produce the raw materials and fuel with the territory of the factory, and that in turn with the territories of the consumer—often the ends of the earth. These international economic relationships are invisible on the maps, but they are none the less real.

" We need new maps !

" These relationships are the great unknown, whose reality is making itself more felt each day. No solution of the world problem can be successful that does not definitely take count of them."

From the international I turn to the national. " What would be your solution of the national problem of the modern State ? "

" The national problem of the modern State, shared by the States in common, is only the international problem on a smaller scale," Mussolini answers. " The same development of economic interests and boundaries that has been taking place among the States has been taking place also within the States. For example, the continual proposals among citizens of the United States for economic committees, industrial congresses and ' organized control of industry' are a recognition of the importance in the present-day national life of these economic interests. This transformation has come about in Italy as well as elsewhere.

" My solution of the problem in Italy is the Corporative State, Italy's interpretation of cooperation, functioning now for six years.

" Since civilization in Italy to-day, like civilization elsewhere in the world, is mainly industrial-economic," he explains, " we have, therefore, in our reform made the government of Italian civilization industrial-economic. Our legislation has always aimed at being intensely practical, dealing with things as they are and letting theory follow, not precede, fact. Since purely territorial interests have been outgrown and no longer have any meaning politically, we have not directly represented them in the Corporative State. The people of Italy are no longer divided into categories according to provinces, but into categories of greater significance —that is, as workers, producers.

" We have seven such categories or ' corporations '—of industry, of agriculture, of commerce, of sea and air transportation, of land and inland-water transportation, and of the professions and arts—comprising all the material and spiritual forces of the nation. The corporations are in turn divided into confederations of employers and employed.

" For convenience of reunion and discussion of common interests we have subdivided these various confederations territorially into syndicates. But these are divisions only for convenience. The divisions of significance are the industrial ones.

" It means that voting is no longer done from the less significant viewpoint of residence, but from the viewpoint of man's major interest, his occupation.

" Thus the persons composing each of the corporations just named vote for representatives within their class and send these representatives to the Chamber of Deputies, which in Italy might be called a House of Industrial Representatives. It will be noted that exactly the same people are represented as before. The difference lies in the grouping, according to occupation instead of residence—a fundamental difference.

" But it must not be thought that the constitutional reform has meant merely a substitution of economic-social interests for territorial interests. There is another change, again simple but fundamental, in the national interpretation of representative and representation."

He is referring to the fact that, though the corporations are seven in number, they have, in reality, in the idea of the Corporative State, been coordinated to form one corporation only, which is Italy. Therein is the meaning of the Corporative State, a union of corporations of production, employers and employed, themselves mutually incorporated to form one major corporation, the State. Thus the Corporative State purposes that the energies of the nation be no longer dispersed but concentrated, coordinated. Though separate in function, their action is unified.

My eyes rest on the giant fasces decorating the fireplace opposite. I cannot refrain from commenting on how perfect a symbol it is—the rods representing the corporations, all of them bound together by the national colours into a compact mass. " *E pluribus unum* "—the symbol of union used also on American dimes.

" Yes, the bands of national colours binding the rods well symbolize the new national meaning of representation. For the function of each Deputy now is to represent, not, as it was before, a political party, nor yet the transportation or agricultural or other category by which he has been elected, but to represent Italy, Italy as a unit, the welfare of the entire Italian people—even if in some special case the welfare of the nation might mean to vote against the temporary interest of the class or corporation. He brings the point of view of his occupation to the Chamber, but his vote must be not financial nor industrial but Italian.

" Such a vote is, however," he adds, " always in the ultimate interest of the Deputy's particular category for—and this is an essential tenet of my Government—the only way to assure the welfare of any part or of all parts is to assure the welfare of the whole. It is this lesson," he observes, " that the present world crisis is teaching us, continuing to teach us on a large scale—a lesson we must learn if we are to solve the world problem."

" How essential does Your Excellency consider the hierarchic element of your economic State ? "

" The factors of the Corporative State have been coordinated in the form of a hierarchy for the same reason that an army is organized as a hierarchy. That is to say, efficiency—first essential in a nation like Italy without natural resources, forced to compete with the world economically to live—the efficiency that comes only from concentrated power and concentrated responsibility, enabling the nation to act as a unit. Italy for the past decade has wished to apply to the reconstruction and production of peace the same conserved, concentrated and directed energy that has been applied in the past only to war.

" In addition," he resumes after a brief pause, " the Italian State is a hierarchy because this is the form into which the Italian people naturally organize, the two classic examples being the Roman Empire and the Roman Catholic Church.

" But the hierarchy is not, needless to say, an essential part of economic representation.

" The Corporative State," he concludes, " is the externalization of Italy's spiritual unity. After centuries of foreign oppression, a half-century of revolution brought her her geographic unity. She then had to pass through the travail of the World War and of subsequent socialism and communism to attain the unity of her spirit.

" It is this unity more than anything else that has been responsible for Italy's decade of progress ; for unity alone makes possible that conservation, concentration and direction of energy that is the solution of the national problem as well as of the international problem—of all problems in the human or scientific world."

" What solution would Your Excellency advise for the problem of capital and labour ? " I ask Mussolini at the beginning of the next conversation.

" In answering how I would solve the capital-labour problem," Mussolini replies, " I can only say how I have solved it in Italy.

" The Corporative State is, as I have said, a Government organized along lines of production, prime essential for the life of a modern nation. Since production is uninterrupted when capital and labour are in harmony and interrupted when they are at variance, and since uninterrupted production is necessary for the mutual welfare of both capital and labour and for the welfare of the nation, the Corporative State eliminates all class struggle and substitutes class cooperation. It stands for the equilibrium of opposed interests.

" For the regulation of capital and labour and the perfection of production we have made a special Charter of Labour, one of the fundamental documents of our revolution, a social contract which substitutes new economic principles for those of the French Revolution which we have abandoned." The Charter of Labour to which Mussolini refers recognizes capital and labour as organs of the State equal in importance, duties and rights, and subordinated individually and collectively to the higher interests of production. In the Italian idea all economic forces must converge to one aim, the augmentation of production and, therefore, of wealth, which alone can assure improving conditions for all workers and citizens of the nation. Since strikes and lock-outs interfere with production, strikes and lock-outs are outlawed ; and capital-labour courts are provided for the settlement of them, so that the rhythm of national life and production may go on uninterrupted.

" The Charter of Labour," Mussolini comments, " protects and encourages private initiative and private ownership, considering them as a most valuable instrument of national life—and integrates them into the State."

" The Charter of Labour provides also for Government assistance of production in times of crisis when production is unable to carry on alone. During the present depression producer after producer has appealed to me for aid," Mussolini relates. " At such times the State rallies the banks to the assistance of the industries and the industries to the assistance of the workers for the ultimate good of all classes. It seeks

through scientific means to coordinate production and consumption, to reduce the cost of production in coordination with falling prices, to calaculate consumption in advance of production.

"And the Governments of the world," he adds, "can no longer remain disinterested in the destiny of the nations' economic interests, especially after this world experience of crisis."

"Has the State found it possible to give assistance in all cases of appeal?" I ask.

"No, for the State has assisted, as the Charter of Labour provides, those industries that are serious and fundamental, and has permitted to die wild-cat industries irresponsibly conceived and directed, schemes for the exploitation of the public and detrimental to the soundness of the national body economic. The State has also at various times discouraged too large a proportion of business given to luxuries, this because Italy, relatively a poor nation, needs her manual and financial energy for necessities. But, even in a country more richly endowed with natural resources, there is serious danger where luxuries are the major business. In the interest of the nation—as well as in their own interest—too large a proportion of luxuries should be avoided, for in time of economic crisis, such as the present, there is money only for necessities, and the failure of the luxury industries imperils the entire country."

"How can a nation overcome the depression and avoid the recurrence of financial crises?"

"Through unity and spirituality.

"Spirituality, together with its sister unity, is what the world to-day needs most. Therefore, together with cooperation, my answer as to how the modern nation should meet this depression and avoid further depressions is that the State should recognize the power and value of the nation's spiritual resources as equal in importance to its natural resources, and study and conserve them accordingly.

"As I have mentioned, without natural resources Italy a decade ago set herself the task of wiping out a tremendous national deficit, of paying her war debts, of achieving economic integrity. To attain this I stimulated first of all the spirit of the Italian people. Whatever Italy has achieved of economic vitality and reconstruction has been mainly through spiritual resources (students of the basis of our economics know how true this is), through a substitution of courage, tenacity and work for the iron, coal, gold and oil which we lack. We know the power of the spirit in Italy to-day, for New Italy, with its schools, roads, bridges, hydro-electric plants, aqueducts, workmen's houses and reclaimed marsh-lands, is primarily a creation of the spirit.

"First, we have been careful to incorporate the spirit as well as the body of industry into the Corporative State. Industry, as you will have observed, has been interpreted by us in a large sense to mean intellectual and spiritual industry as well as manual. The intellectuals as such have been organized and incorporated into the nation along with the bankers and farmers. And, for example, considering the talent or genius of men of science engaged in research as one of the most valuable and indispensable resources of the country, the State has established

and organized under its direct patronage a National Council of Scientific Research to guarantee material and spiritual well-being to men of science, the State itself to coordinate their activities with the needs of industry, farming, commerce and administration. We have founded the Italian Academy to protect and advance the literary, artistic, scientific and historical work of the nation. There is also the National Institute of Fascist Culture directed by the philosopher Giovanni Gentile, the Historico-Diplomatic Commission, Annual Congress of the Philosophers, the annual Book Fairs, Government literary prizes, critical editions of the Latin and Italian classics, expositions of the fine arts—all of them fields of spiritual life directly sponsored by the State, as much a part of Government activity as its issuance of currency or its enforcement of the law.

" Second," the Italian Premier enumerates, " is the direct interest of the State in education. One of New Italy's first reforms was in education —for the development of character as well as mentality, and the integration of character with life. The Italian Government acts for the cultivation of man's spiritual wealth through its Ministry of Education, as important in the State as its Ministry of Marine.

" And third, through government by intelligence. In the making of our laws, as in all our activities, we call regularly on the country's intellectual resources, appointing specialists to our commissions, a large proportion of them university professors. We have aimed to substitute political scientists for politicians in a desire to make laws worthy of the people's respect : we believe that the only happiness and well-being are in harmony with the law. We exalt the law, for the ideal law hampers only those tendencies of man that are less worthy and frees all that are more desirable. In such law is true freedom.

" In the State direction of farming we have commissions, mostly of professors of agriculture, giving expert advice to all the farmers of Italy, helping in the selection of seeds, fertilizer, machinery, and in the Government land reclamation and so on. No State can afford to be indifferent to agriculture, since it is the very basis of life and, therefore, of prosperity."

" And the *Dopolavoro ?* " I refer to the national Italian " after-work " recreational and cultural institutions for the workers.

" Yes, there is the *Dopolavoro,* too, one of the most important elements of my Government. I feel that the *Dopolavoro,* with its various branches of instruction, artistic, physical, social, hygienic, together with its theatres, libraries, excursions and the like, is vital ; for man's increasing leisure is one of the major problems of every State, offering, as it does, possibility for peril or growth according to the opportunities afforded by the environment. And certainly our State censorship of recreation is one of our most effective means of conserving spiritual and mental energy, especially the censorship of the cinema, with its vast powers for either moral decadence or recreational wholesomeness. Then there are the Public Works, the Protection of Maternity and Infancy, the organizations of young people—all among the various channels we utilize to incorporate spiritual energy into the State."

In the Public Works, to which Mussolini refers, Italy, again through a special Ministry, instead of subsidizing idleness and lowering morale

through a dole, directs such funds into the improvement of the country —the erection of public buildings, workmen's houses, roads and reclamation projects, solving at the same time in large measure the problem also of the unemployed war veteran.

" Through the organizations of girls and boys and young men," the Premier comments, touching again upon the concept that the future is at least equal in reality to the present, " we transmit to Italy of to-morrow the unified national consciousness and the spiritual ideal of our country.

" Direction and development of the spirit, that is my answer to your question as to what the world needs most to meet this material crisis and to avert further crises."

About ten years ago Mussolini defined the goal of Italy as that of becoming a nation without which it would be impossible to conceive the future history of humanity. I recall that definition to him.

" Yes," he replies, " and I feel we are nearer that goal precisely because we have aimed for it."

" And what would you consider as a worthy goal for the World ? "

" Life and life more abundantly, the only true and worthy goal of man. Life is the motive of all man's actions, however blind, and, even though his sense of its meaning be clouded, the goal of our civilization and of all civilization. We must consciously recognize this goal and use our intelligence to achieve the spirit and unity that are the only means to attain it.

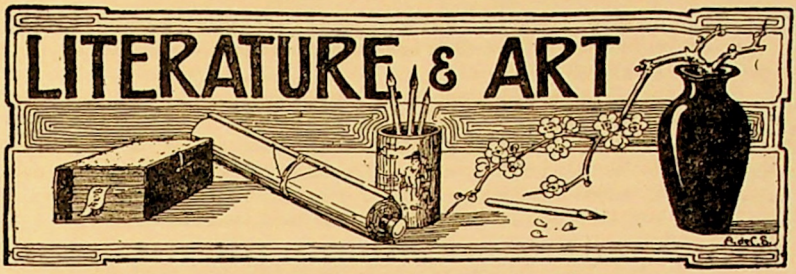
" Our international conferences have failed in so far as their sense has been divided and materialistic. They would succeed at once if they kept paramount harmony and the considerations of the spirit. ' Considerations of the spirit in economic conferences ? ' it will be asked. By all means ! In our economics is just where we have needed the spirit and where we have lacked it most—therefore, our disintegration. Let man face and know his own soul, and our problem is solved. One man can do much. A group, spiritually united, can perform miracles."

It is the end of the concluding conversation. Mussolini rises from his desk and goes to the window from which he has looked upon the upturned faces of so many crowds of Romans. He stands there gazing beyond the monument of modern Italy and beyond the Colosseum and Forum of the past into the future. " This is the world of the future," he describes it, " a world of more abundant life such as we have not known before. This is the new world that we are entering, where man will be more truly free for—well, as America defines it, ' life, liberty and the pursuit of happiness.'

" With our intelligence, our spirit, we have made our civilization," he resumes again in Italian, " with our spirit we must save it." It is the spirit, then, which is our pathway to the future, over chaos. What is dying in our civilization is only a false idea.

" New Italy has a battle cry of peace. It is ' *A Noi !* '—' It is ours ! ' —" Mussolini looks down at the *Piazza* that has often thundered back to him that cry—" the responsibility, the danger, the glory.

" A new era is dawning—the era of the future, and we men of to-day, only we, can be its creators."



CHINA'S CURRENCIES, ANCIENT AND MODERN

BY

ARTHUR DE C. SOWERBY

The earliest objects believed to have been used for currency in the part of the world now known as China appear to have been cowrie shells. At least this is the explanation offered by archæologists of the occurrence of shells of *Cypraea moneta*, the common cowrie, found in the prehistoric site at Yang Shao and the Shang Dynasty site at An Yang, both in the province of Honan, which is generally accepted to have been the cradle of Chinese culture and civilization. Whether these shells were secured on the China coasts or were brought in from Southern and Western Asia in the course of trade has not yet been determined, but, in view of the rarety if not actual absence of the species along the shores of this country, at least from the mouth of the Chientang River in Chekiang Province northward, it would seem the more likely that they reached China as a medium of exchange in commercial transactions that took place between the early Chinese and the peoples of Central and other parts of Asia.

The theory that the cowrie shell was a medium of barter helps to explain the form of certain other objects, made from metal, which have been found in China and roughly resemble these shells in appearance. These have been explained as early types of money by the Chinese. They seem to be very rare, and we have seen only a few specimens. There used to be some in the Museum of the Anglo-Chinese College in Tientsin, if our memory serves us aright.

Although the presence of cowrie shells and later of imitations of cowrie shells in China in these early periods of the country's history and prehistory suggests the use of tokens in trade, there are other things which rather suggest that barter, the actual exchange of articles and commodities, was the more prevalent custom ; for we find that the earliest metal objects that were actually made for use as tokens in trade, that is, currency, were fashioned after objects of every day use, such as the blades of spades, hoes, swords and knives. It is obvious that the Chinese made models of the objects they used for barter. These also

indicate very clearly that the Chinese from earliest times were essentially an agricultural people. Had they been a pastoral people who had devised this means of currency, the coins, if we may call them such, must inevitably have taken on a different form.

It was, however, very early in the history of China's currency, in the Chou Dynasty (1122-255 B.C.), in fact, that the round flat coin with a square hole in the middle, commonly known as a cash, came into being; and, obviously, since it was the most convenient shape, it persisted when all other shapes ceased to be used, and remained the type of coin used in China till the latter part of the Ch'ing or Manchu Dynasty in the nine- teenth century, when the advent of Europeans brought in the typical unperforated coin of the West.

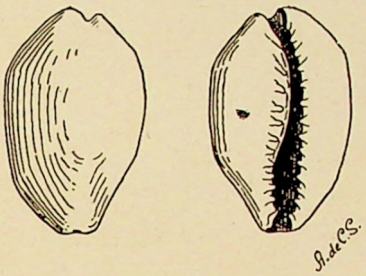
In the Han Dynasty spade, knife and sword coins were prevalent, representing the higher denominations, while the round cash as well as small flat pear-shaped coins represented the lower denominations. Many of the Han Dynasty cash had round holes. The so-called "trouser coins," or *Han Shao Pi*, shaped like a pair of trousers, also came into existence in the Han Dynasty. Eight of these placed end to end made a Chinese foot.

The metal used for making coins in China has mainly been copper and its alloys, bronze and brass. In the Chou Dynasty lead was also used, however, and in later periods there were iron cash as well, the latter only being made when troublous times caused a shortage of copper. There does not appear to have been any use of gold or silver in the form of coins in China prior to the advent of Europeans, though some of the cash issued in the earlier dynasties, Chou and Han, and later in the Sung, were inlaid with gold.

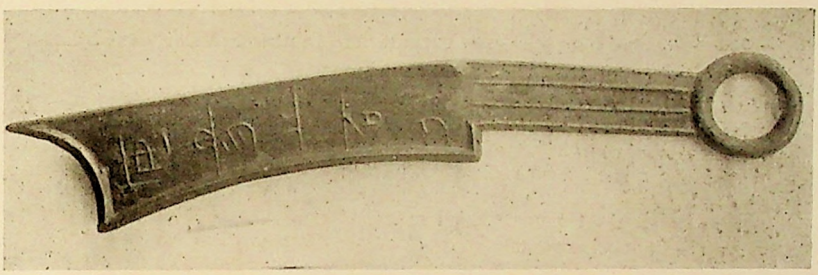
The cash coins of China apparently have always been of a very low value, and, although for the most part ranging in size between that of an English halfpenny and a farthing, were worth, at the time just prior to the introduction of Western style coins, roughly about thirty to the penny. There was no constant value in relation to silver, a Chinese ounce of which is known as a tael and was the only other unit of currency in China up to the introduction of the Mexican dollar for trade purposes in the early days of foreign intercourse. The relative value of cash and silver taels fluctuated according to the scarcity or abundance of these units of currency, while the number of cash to a tael also varied from place to place.

As a result of official perfidy and corruption in the matter of paying soldiers, it is alleged, a strange phenomenon arose in regard to cash. This was that a nominal hundred cash was not represented by a hundred actual coins, but by anything from as high as ninety-six down to as low as eighty coins in a string called a hundred. In ascertaining the price of an article one always asked whether it was in "full" cash (*t'ung ch'ien*) or small or local cash (*ti-p'ien ch'ien*) in order to discover the actual number of coins one was expected to hand over.

Cash were always handled in strings called *tiao*, varying in number of coins to the string from place to place. The most common was a *tiao* consisting of a nominal thousand cash, strung in double sections of a



The Common Cowrie (*Cypraea moneta*) found in Prehistoric Sites in Honan, possibly the earliest Kind of Money used in this Area, and brought in from other Centres of early Culture to the West in the Course of Trade.



A Knife or Sword Coin, one of the very earliest Forms of Currency used in China. It dates back to the Chou Dynasty, B.C. 1122-255, and suggests that real Weapons were previously used in the Process of Barter.



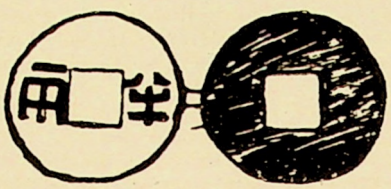


By Courtesy the "North-China Daily News."

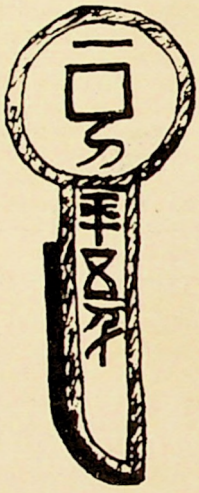
China's latest Currency, the new 1933 Silver Dollar that is to replace the Tael, or Chinese Ounce of Silver, at the Rate of .715 of a Tael to the Dollar. It is supposed to contain 23.493448 Grammes of Silver, or 88 per cent. of Silver and 12 per cent. of Copper.

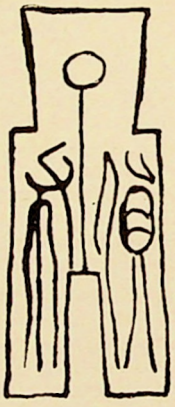


An early Chou Coin



A Ch'in Coin with Characters on one Side and Blank on the other, still in Circulation in the Interior of China.







Various Types of Coin used during the Han Dynasty, said to have been issued by Wang Mang, A.D. 9-20.

nominal hundred coins each, like a double string of sausages. In some places a *tiao* was only a hundred or two hundred nominal cash.

When the cash was the recognized unit of currency of the country, living was exceedingly cheap, because of its low value. An egg might be bought for four cash, for instance, a chicken for a hundred cash, and in some places a whole sheep for a thousand cash. Translated into English money at that time this meant eggs at eight to ten for a penny, a chicken for three pence, and a sheep for a couple of shillings. Even as late as 1907 in the province of Shensi a pound of flour cost less than a penny. The poorer people of China never saw silver, and only the very rich ever handled gold, which, in the form of leaf, was sometimes used as currency, usually when a merchant or traveller wanted to convey a large sum of money from one place to another a considerable distance away. The Chinese have long employed bank notes, but these were mainly issued by local banks and had no currency outside the district or town in which those banks were located. They were for denominations of a nominal thousand cash or less, and served to make up for shortages in the supply of the copper cash coins.

The advent of the Western style copper coin, or cent, nominally a hundred to the silver dollar, and representing ten copper cash, had the immediate effect of increasing the cost of living wherever it was introduced. It became the unit of currency, and the cash began to disappear. During the World War the Japanese bought up enormous quantities of cash and smelted them down for the copper and brass they contained, shipping this out of the country to help make up the shortage of these metals in the world's markets. And, as a result, in all coastal areas the cash practically ceased to exist as a medium of exchange. In the far interior, however, this coin is still in general use, especially in rural districts, and it and the silver tael are the only forms of currency known to the people, many of whom have not yet heard about, much less seen, a dollar, a ten cent piece or even a copper cent.

It is difficult for people of Europe and America, accustomed only to the handling of coins and notes, to understand the use of silver by weight, and one not infrequently hears the question asked, "What is a tael like?" As a matter of fact the raw silver in China is smelted into bun-shaped lumps or boat-shaped ingots, the former weighing from roughly one up to three or four Chinese ounces, *i.e.*, taels, and the latter up to fifty ounces. These boat-shaped ingots are called "shoes", while the raw silver is generally known as "sycee" in pidgin English, the business language of the China ports. In any transaction involving the use of sycee, or bullion silver, the lumps and ingots had to be weighed, and every business establishment, cash shop and bank in the country had its sets of balances or scales for this purpose. The traveller in the interior also carried his lumps of silver and weighed them out with his own pair of scales whenever he had to exchange them for copper cash or local bank notes with which to pay his bills and make his small purchases. Usually, on arrival at a city or town on one's journeys, one took out a few lumps of silver, according to one's needs, weighed them, and sent one's servant to one of the local cash shops to exchange them for cash,

enough to last one to the next town or city. To carry more than a couple of taels' worth of cash with one was a burden, owing to its weight. There are, in fact, stories of travellers in out of the way places having to engage special porters to carry the cash they needed, since silver was not known to the people of the districts they were visiting, and then having to pay almost all of the cash so transported to the porters as wages.

Even the carrying of sufficient silver for a long journey was a burden, and might prove dangerous, being a temptation to robbers. But this difficulty might be overcome by securing letters of credit or drafts from the big native banks, several of which, operated by certain famous banking families of Shansi, chiefly of the small town of T'ai-ku Hsien, to the south of Tai-yuan Fu, the capital, had branch offices in every city and town of any importance in China. Incidentally, these Shansi banks had their own postal system throughout the country, and, prior to the inauguration of the Government Postal Service in China, which took place in the interior towards the end of the nineteenth and early in the twentieth centuries, one could send letters through the banks to any city or town in the country, providing one was willing to pay the rather high fees.

The founding of a Government bank towards the end of the Manchu Dynasty, with branch offices in all the large cities, brought about big changes in the currency system in the interior, for with these branch offices came the silver dollar, as well as subsidiary silver coins, and, of course, the copper one cent piece. Neither the subsidiary silver coins, mostly ten and twenty cent pieces, nor the one cent copper coins, supposedly a hundred to the dollar, have ever been worth their nominal value, but have always been at a discount. At times the one cent pieces have stood at less than a third of their face value. This is because in China coins have always had a tendency to assume the value of the actual metal they contained.

The dollar itself has an interesting history in China. The first to be used here was the Mexican coin, which was shipped over in American ships for use in the Canton trade in the early part of the nineteenth century. This was used exclusively for many decades, and accounts for the term Mex. when referring to the China dollar as distinguished from the United States or Canadian gold dollar. The Mexican silver dollar is still in use in China, and may often be seen along with those minted in the country, with which it is on a par value. The Chinese Government ultimately began minting and issuing silver dollar pieces. There was a period when what was called the Hongkong dollar, a fine silver coin originally minted for use in the Straits Settlements, was extensively circulated in China. After the overthrow of the Manchus and the establishment of the Republic in China new silver dollars were minted with the heads of the various presidents, such as Yuan Shih-kai and Sun Yat-sen, on them ; but the old Manchu dollars remained in circulation and are still commonly used.

Mention must also be made of the system of bank notes introduced first by the foreign banks in China and later issued by the Chinese Government and other native banks. Some of the latter have had a very

bad record, as a result of over issuing on the part of local authorities. Notably was this the case in Manchuria, during the latter part of Chang Tso-lin's regime, when enormous quantities of notes were printed and issued, and the merchants and farmers forced to accept them in exchange for their commodities. Naturally the value of these notes fell to very low levels and caused widespread ruin amongst those forced to accept them.

On the whole, however, the regular Government bank notes have retained their full value, and are now universally used and accepted, being naturally far more convenient than the silver dollar. Their denominations range from ten cents up to $100. Tael notes have also been printed and issued in China, but these have never gained much popularity.

And now comes the latest silver dollar, the one that is designed to take the place of the tael in the currencies of China. It is valued at .715 of a tael of silver. What its destiny is going to be none can tell, except to say that only as long as it is minted with its proper weight and proportion of silver will it retain its full purchasing power in the country.

Whatever the Government decides to make the unit of currency in China, the real basis will be silver, since this is the only commodity the people all over the interior understand ; and the Government dollar will find its currency value according to its silver content. It will be a very long time before the Chinese people as a whole get out of the way of thinking in terms of silver, that is, bullion silver, and the value of a coin according to its silver content ; and this is an important point for all Westerners engaged in the China trade to remember. The lower the value of the currencies of their own countries are in relation to silver, the higher the buying power of the Chinese

CHINA'S POPULATION

FEEDING, CLOTHING, HOUSING AND DISTRIBUTING THE MILLIONS

It may be taken for granted that the word " population " conjures up in the minds of most people visions of long rows of figures. It is not easy for the human mind to think of population in any other terms, and, even so, it is certain that few have any real conception what such figures stand for.

A million people! Who can actually visualize this? We know what a hundred people look like, or a thousand, since we have all seen groups of our fellow beings of these magnitudes—a thousand or may be two or three thousand soldiers on parade, for instance, or an audience in some great hall. Many of us have at some time or other even been units in a concourse of tens or even hundreds of thousands of people, as when a whole city turns out on some great occasion of national rejoicing or other excitement. But a thousand times a thousand soldiers on parade is something beyond our mental grasp, except with the help of figures—a one (1) followed by six ciphers or noughts (0), as 1,000,000.

Yet a million represents only a comparatively small proportion of the population of any given country, whose total number of inhabitants must be reckoned at least in tens of millions. Here are a few examples arranged in order of their numerical strength as far as possible based on the latest census available:

China (Proper)	474,418,000	(June, 1931)
India	353,000,000	(1931)
U.S.S.R.	163,166,000	(November, 1932)
United States	123,645,000	(Preliminary estimates 1931)
Japan	90,396,043	(January, 1933)
Germany	65,000,000	(1931)
Great Britain	44,790,485	(April, 1931)
Java	44,000,000	(Roughly)
Italy	42,531,000	(February, 1932)
France	38,246,000	(1926)
Manchoukuo	34,000,000	(April, 1932)
Spain	23,556,867	(January, 1933)
Korea	21,000,000	(July, 1931)
Philippine Islands	12,590,369	(June, 1932)

What do all these figures mean? As they stand they have little meaning, but, when we begin to look up past records and find out what the populations of the various countries listed above were a century or so ago, their significance is startling. They show that the world's population is increasing literally by leaps and bounds; and this has a very important bearing on world economics, when taken in conjunction with other big factors, such as production, distribution and finance.

Somehow these ever increasing millions of human beings have to be fed, clothed and housed; and how this is to be done fairly and to the best advantage of all concerned is the great task confronting the rulers and economists of present day China, where things are changing rapidly, and old systems and customs are giving place to new.

One of the most difficult aspects of the population problem is the way people have of herding together in more or less limited areas, producing monstrosities in the way of great cities, and causing a congestion, to deal with which calls for the highest degree of organization.



Photo by Mactavish & Co., Shanghai.

A Chinese Peasant Woman at work at her Spinning Wheel of an age-old Type still commonly used in Rural Districts.



A Hunter of the Mountainous Area of West Shansi, with his antiquated Shot Gun, still in use all over China.



Photo by Merl La Voy.

Members of the Agrarian Population of the fertile Lower Yangtze Region going to Market.



Photo by the Clark Expedition.

Criminal Exiles in Kansu, chained to long Bars of Iron. When they have served their Sentences, they will probably settle somewhere in the vast North-western Territories of China.



Photo by Merl La Voy.

Casual Labour in Rural Kiangsu. This Boy is a member of a Gang of Labourers working on Farms during Harvest Time. He is carrying the big Cauldron in which their Daily Rice is cooked.



Many hundreds of Boys and Girls roam the Streets of Towns and Villages in China begging for Food. The Home of Onesiphorus in Shantung rescues this type of Vagrant and turns them into good and useful Citizens.



Some of the Chinese Babies cared for in the Home of Onesiphorus in Shantung.



Old People are taken into the Home of Onesiphorus in Shantung and cared for during their last Years.

Take as examples the populations of a few of the world's greatest cities :

London, ...	10,000,000	(C. B. Fawcett of London University, January, 1932)
New York	6,981,927	
Berlin	4,287,000	(January, 1933)
Shanghai	3,249,152	(February, 1933)
Moscow	2,863,000	(January, 1932)

Think what it means in the way of finance and transport alone to cater to the needs of such vast hordes of people, deprived, as they are, by the fact of being crowded into such small areas, of the means of foraging for themselves, as they could and undoubtedly would do if scattered over an adequately wide stretch of country ! Of course, up to a point, the crowding together of people makes it easier to organize for their needs, but beyond this point the matter becomes increasingly difficult, till at last it is almost impossible.

The population of China, which is the biggest in any country in the world by well over a hundred millions, is something that calls for the closest consideration, not only of the rulers and leaders of this country, but of those of the other big countries, for this great mass of people wrongly dealt with and cared for might well become a menace to the rest of mankind.

We are not, for the moment, thinking of what the millions of Chinese might do in a military sense if they were properly organized, armed and led. That would be something beyond the control of anything but the combined military forces of the rest of the world.

Our present purpose is to try to convey some kind of idea of China's four hundred and seventy odd million people as a factor in world economics—what such a mass of people needs in the way of food and clothes and how to supply those needs.

Of course, it must be realized from the outset that China herself can at present, or could if forced to do so, take care of the needs of practically the whole of her population without going abroad for food, clothes or other commodities or articles.

China's position economically in relation to the world at large is unique in this. She does not actually need anything that the rest of the world can give her, for she is self-contained as far as all the necessities of life are concerned. She could, if she so wished, grow all the food her people need, make all the clothes they need, build all the homes they need from native materials. She is not like Great Britain or Japan, whose territories are too small to produce all the food their people consume, and so have to manufacture goods to give to other countries in exchange for what they require.

In spite of this, however, the Chinese have never been completely satisfied with what they themselves could produce, and so from the very earliest times have sent their traders to other countries for a variety

of commodities, and have thrown their ports open to traders from foreign lands.

And as time has passed these lively and intelligent people have increased rather than diminished their desire for various foreign commodities and products, till to-day there is an enormous import trade in goods from all over the world. Yet still this vast market is far from being satisfied, and potentially China's capacity in this direction is many times what it has been up to the present.

It is mainly a matter of finding out how best to develop this market, how to present the goods that foreign manufacturing countries have to offer. And in this connection it is important to remember that the mass of the people in China, although industrious and thrifty, are by no means affluent. They live on a meagre scale and are paid comparatively low wages. The result is that they have not, individually, got much money to spend. To devise means of meeting this small individual spending power, then, is one of the most important problems for the foreign manufacturer and merchant, who desires to get into the China market.

Articles as cheap as is compatible with efficiency, commodities done up in as small packages as possible—these are two of the things that will appeal to the Chinese buyer, that is to say, to the masses of the people.

Of course, there are plenty of Chinese who are sufficiently well off to buy even the most expensive things, but, rich or poor, your true Chinese is thrifty and will nearly usually go for the article that costs him less, even if it is not quite up to the best standard.

If to a low price can be added an attractive appearance, which generally means bright colours, the article will inevitably prove a winner in the China market.

The principles that apply to the feeding and clothing of China's millions apply also to the housing of them. What these people need and like are small comfortable and hygienic dwellings at a comparatively low rental. In large cities the plan of erecting numerous large apartment houses with one, two or even three roomed flats, each with its kitchen and some kind of bathroom, might prove the best method of solving the housing problem. This has been successfully carried out in Hongkong, and to a lesser extent in Shanghai. Numerous open spaces and public parks would be necessary if this arrangement were adopted, so as to counteract the congestion and give the city dwellers a chance of getting exercise and fresh air.

In villages and towns of the rural areas small but hygienic and comfortable houses modelled on the Chinese plan would doubtless prove more suitable and attractive than apartment houses or tenements. And, above all, care should be taken to ensure proper sanitary arrangements and adequate water supplies. In these respects conditions are for the most part exceedingly bad at present. In the new China that is coming there must inevitably be a great demand for building materials, standardized and suited to the requirements of a low-salaried people as outlined above.

Finally there is the matter of distribution of China's millions of inhabitants. In this country, as elsewhere in the world, there is a strong tendency on the part of the people to drift towards the cities or into already congested areas. A survey of the country from this point of view shows that such areas as the fertile flat-lands of the east, the great Yangtze Delta, for instance, or the rich alluvial plains of the north-east where the Yellow River has spread its silt, have become altogether too thickly populated, while vast stretches of country in the north-west are too sparsely populated. As an example, the whole of the population of the great province of Kansu is about 5,000,000, whereas that of the area immediately surrounding Shanghai in a comparatively small section of Kiangsu at the mouth of the Yangtze is about the same figure. Even if it be admitted that the rich alluvial deposits of the Yangtze Delta are capable of supporting many times the population, acre for acre, that the arid semi-desert wastes of Kansu are, the existing disparity between the populations of the two areas is far too great, and much could be done to overcome the present congestion in certain parts of China by a well thought out plan of redistribution based on a carefully made survey.

This applies to other countries besides China ; the British Empire, for instance, with its huge unoccupied territories on the one hand and its hopelessly congested urban areas on the other. There is no real economic reason why 10,000,000 people should be crowded into what has been called the London "conurbation," and large numbers of this vast concourse of people would be infinitely better off in every way if they were transplanted to the open spaces of the colonies.

As regards the population of China, it is interesting to note that there used to be a very considerable overflow into Manchuria, but this has ceased, not only on account of the political situation, but because of the depression that began in that country in 1929, largely owing to the great falling off in the world's demand for the soya bean and bean oil, upon which the prosperity of the country had mainly rested. Incidentally, it may be mentioned that both the rich territories of Manchuria and the arid regions of the north-west were extensively used during the Manchu Dynasty as places of exile for Chinese prisoners, both political and criminal, many of whom remained in these areas the rest of their lives, settling on the land and establishing families. A practical suggestion that has already been put forward in the pages of this journal is that the huge armies of China, many of which serve no other purpose than to bolster up the position of some truculant warlord and constitute a menace to the peace and prosperity to the country, should be disbanded, and the soldiers sent to colonize the less populated areas of Kansu, Chinese Turkestan and the borders of Mongolia and Tibet.

A. DE C. S.

THE HOME OF ONESIPHORUS

BY

L. M. ANGLIN

In the following article is given a brief account of the kind of missionary enterprise that is really helpful to the Chinese. Apart from its spiritual value to the country, it has a very definite economic one, and in its own way points the road to the industrial development without which China can never hope to take her place amongst the great nations of the world.

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Somewhere near the site of the Home of Onesiphorus in Shantung Confucius stopped one day over two thousand years ago. His attention was called to a poor woman who was pouring out her heart's sorrow in bitter weeping. The old teacher asked why she was weeping, and she told him the pitiful story of how her father-in-law had been killed by a tiger near the spot and how later her husband had suffered the same fate. "Now," she said, "my son has been killed by a tiger."

Since then the bitter wails of thousands of poor souls have filled the air, until to-day the cry comes not from one poor woman but from thousands of old and young, male and female. However, the cries of these poor people to-day are not caused by a tiger having killed some of their relatives : a more cruel monster than a tiger has stretched forth his fatal paw and crushed them down into poverty with all the degredation, misery and woe that follows in its wake.

The Home of Onesiphorus was established in 1916 to bring help to these who are thus suffering. A more beautiful spot could not be chosen for the location of this Home. Throughout the year we can look toward the top of Tai Shan, from which one may look eastward on a clear morning and see the sun rising out of the sea several hundred miles away. During the winter months the top is often covered with snow. When the summer rains come the whole mountain takes on a lovely coat of green. This makes a beautiful background for the Home that has become a shelter to so many helpless ones during the past.

The opening of the Home was really the launching forth of a new plan to help these poor people suffering from poverty's cruel fate. The vision of "Helping the helpless to help themselves" was made very clear to us. We believed that it could be done. We opened our doors to these poor and needy ones, and invited them to come in and make this their haven of rest from their sorrows. At first we had only five boys, but, since we have added to our family each day, boys, girls, widows and old men, our number has increased to several hundred within a few years. During the spring of 1928 we had 1,150 people eating at our table and doing good honest work in the Home.

At the beginning of the work we planned to give every boy and girl an opportunity to make good in life. We realized that without

a certain amount of education a boy or a girl cannot become a useful citizen of any country. We organized a school in the Home and allowed each boy and girl half of each day to go to school. The plan worked well. We soon found that our boys and girls were in no wise behind the children of the public schools in their studies. In fact, we found that in many cases they were more thorough in the knowledge they had acquired.

After ten years of careful labour and planning we were able to invite the public to attend the first graduating exercises of the Home school. The whole city was interested, and hundreds came to see a sight that they had never witnessed before—young men and women, who were once boys and girls taken from the beggars' ranks, address a public gathering of men and women of high standing. One official said that he had never witnessed anything like it in his life. Tears flowed freely from the eyes of strong men as they listened to these young people tell of their struggles and of the hope that had been kindled in their hearts by coming into the Home of Onesiphorus.

As the plan of the Home was to develope young men and women who could rely upon their own resources for support, we had to give much time and attention to industrial work. Schemes had to be devised whereby we could produce practically all of the things necessary for our own use. One by one we added to our Home different industrial departments, which give employment to the inmates of the Home, and which have proved to be intensely interesting to all of our numerous visitors.

Our Industrial Department consists of the following :

One 36 bbl. Flour Mill, which paid for itself in less than three years time.

One 15 K.W. General Electric Generator, which supplies lights for our whole institution.

A Weaving Shop, which employs sixty boys and furnishes us with cloth for our own use besides thousands of feet sold on the market each year.

A Knitting Shop, which employs twenty-three boys and twenty-two girls. Our " Dove Brand " goods are well known, and we have a contract with a firm to take all the goods we can produce from this department and from our Weaving Shop.

A Sewing Department employing forty-nine girls. This department makes fancy work that is sold on the foreign as well as on the Chinese markets.

A Farming Department, which gives us an opportunity to demonstrate to our students and the general public what can be done along this line by using a few up-to-date methods.

In connection with these departments we have a Dying Shop, a Carpenter's Shop and a Mechanic's Shop, which are all indispensable to this great work and give employment to a large number of boys.

These departments are all properly accommodated in houses of semi-foreign style.

For a number of years we have had the whole-hearted cooperation of the officials and leading business men of the city, which has enabled

us to make better progress in our work. Gradually the Shantung Government has learned to know of our work and has set its seal upon it by lending us $10,000 without interest to help expand it.

That which has been accomplished during the past seventeen years encourages us to believe that greater things can be done in the future. When we see the type of young men and women into which poor beggar boys and girls have developed, we are sure that there is some fine material in other such boys and girls who are now roaming about, covered with rags and begging food to keep themselves alive.

We are planning to enlarge our present Industrial Plant, thus providing work for hundreds of other boys and girls who would make good if they only had the chance. All of our friends are also hoping that with great strides we shall move forward in this good work of "helping the helpless to help themselves," and we believe that with the continued cooperation of the authorities, both local and provincial, and also of individual friends, we shall be able to build up an even Greater Home of Onesiphorus.

ART NOTES

The Economic Importance of Art: That art, however, much it may be despised by the average business men, and especially the leaders in finance, commerce or industry, is of very vital importance to economics cannot be denied when a proper survey of the situation is made. Leaving aside, for the moment, its importance is the cultural life and development of a community, its bearing upon the marketing of manufactured articles must be obvious to those who will stop to consider the matter. Of two articles equal in all respects in the matters of efficiency and price, the purchaser will obviously choose the better looking, that is, the more artistic. Perhaps the application of art is confined merely to the packing of the article. If so, that which is the more artistically done up will offer the greater attraction to the purchaser. And who can possibly deny that, in all such products as fabrics for clothing or use in the home, household furniture, utensils and decorations, books and the like, the more artistic they are, the better chance they have of selling?

Then, too, comes the indispensible use of art in the all important matter of advertising. Here, perhaps, is the greatest field for so called commercial art. The beauty of the rose and the lily is nature's response to the need of advertising. The flowers have certain wares, honey and pollen, to sell to the bees and other insects in return for the performance of certain functions, fertilization, but they have to advertise their whereabouts and the quality of their wares. The more beautiful the petals of the flower, the more surely it attracts its insect patrons. Just so in the world of human economics, the more beautiful the means of attracting the notice of the purchaser the greater the certainty of making sales. And when we say "beautiful" we mean artistic, for art is man's gauge of beauty.

The importance of art to industry and commerce was emphasized at the 1932 annual dinner of the Design and Industries Association, which took place towards the end of the year in London, when one of the speakers, Sir Stephen Tallents, said that "Design has the virtue of carrying the articles

which possess it over tariff barriers and national prejudices." He stated the belief that during the next few years it is within the power of Great Britain to reconquer by beauty what has been lost to industrialism, and referred to the exhibition of British industrial art that is being held in London this spring, and to a film which is to go on tour showing some of the most interesting processes in British industry. He also said an important Marketing and Advertising Exhibition had been promised. He further found encouragement in the best of British shop window displays, in the better-class British posters, and in some of the recent buildings in England — all of which showed a real advance in the employment of art principles.

There is another important side of art in relation to economics, however, beside the purely commercial one, and that is its bearing upon the cultural life and development of a people. Mr. William Dangaix Allen in his article "Creating a Filipino Art," which appeared in the April issue of this journal, lays stress upon the effect a native or indigenous art has upon a group or race of people by giving them a common culture which binds them together and arouses in them what may be called a national consciousness. This is undeniably a fact, for which reason the developing and fostering of a national art in a given country must become a very definite factor in its economic life, cementing together its various elements, standardizing the outlook and requirements of its people, and thereby working towards unity and strength.

Thus China's wonderful inheritance of art and the genuine love of her people for all art forms are amongst her most important assets and are powerful factors in her economic life.

China's Art Industries: It is impossible in this brief note to make a thorough survey of China's art industries, but no discussion of the economics of this country could be considered complete without at least mentioning some of the more important of these.

Which, of all her art industries, is the most important from an economic point of view it is difficult to say, since adequate statistics of the capital involved, the quantity manufactured, or the number of artizans or labourers employed are not available. Statistics of exports may be had, but these will not help in forming an estimate of the total output of the industries involved, because information regarding the extent of native consumption is lacking. One thing is certain, namely, that at present China herself consumes a far greater proportion of the goods she manufactures, such as silk fabrics and porcelains, than she exports. Probably these two lead in the field of what may be termed art industries. In spite of political and social disturbances in the areas where these industries are mainly situated, their output is enormous, and those sufficiently curious may form their own conclusions as to the importance of these industries by visiting the large stores or smaller shops in Shanghai where silk and porcelain products are retailed.

The silk fabrics made by the Chinese to-day are as fine as ever they were. Nothing has been lost in this branch of the country's artcrafts. The same, however, cannot be said of her ceramic art, for the secrets of many of the most beautiful wares of the past have disappeared completely, and, try as they may, the modern potters cannot emulate such beautiful porcelains as those produced in the Sung, Ming, Yao and early Ch'in Dynasties. What they produce now, while serviceable enough and beautiful in its way, is not to be compared with these masterpieces of the past. The shapes can and are copied, but not the colours and glazes, in the production of which lay the secrets that have been lost.

In the matter of lacquer ware, too, the Chinese have lost a great deal of what they had in the past. There is one striking exception, however, and that is the famous Foochow lacquer ware, which is one of the very few art industries of China that has reached its highest stage of perfection in the present day. It is said, with what truth we cannot say, that this industry has its secrets, which are held and jealously guarded by the heads of one or two families in Foochow. We rather suspect that, while this may have been true a decade or so ago, it is not true to-day, for the quantity of this fine ware that is now appearing on the market is too great to have been made in the back yards of one or two families as of yore.

Foochow is also the centre of the carved red-wood (also called tea-root) industry, and it is interesting to note that the carving has greatly improved of late years, and is a nearer approach to the carving that used to be done in the same locality when Westerners first came to this port and developed the wonderful tea trade that it enjoyed so long. Nowhere in China is better wood carving done than in Foochow, and the redwood figures now appearing on the market from this centre can only be described as exquisite.

Ivory and jade, crystal, rose-quartz and other semi-precious stone carving, has developed of late years into a regular industry in both Canton and Shanghai under the stimulous of an increasing demand for such objects in Europe and America. The best of this present day work is equal to almost anything that has gone before, but a lot of the stuff turned out is of inferior workmanship, owing to the desire on the part of those engaged in the industry to secure quick returns. But the various antique and curio stores on Nanking and Bubbling Well Roads and adjacent thoroughfares in Shanghai can be trusted to supply the best qualities of such articles obtainable, providing, of course, that an adequate price be paid.

There appears to be an increasing demand for Chinese silver ware in the European and American markets; not the old style Chinese silver ware so much as the more modern, in which Western articles of use are made with Western designs but in the heavy solid silver of the purely Chinese articles. There are numerous shops in Shanghai that retail this silver ware, most of which is made in small workships in the native city belonging to or associated with the establishment where it is sold.

In Peking there are other art industries, one of which is the manufacture of cloisonne ware. That made to-day is extremely good and very artistic, more so, perhaps, than that of the past, although the older ware has points in its favour not found in the modern stuff—colour, materials and an originality of design. All the cloisonne ware made to-day in Peking consists of stereotyped designs and colours, while it is claimed that the enamel shows a greater quantity of air bubbles than that of earlier periods, in which a great variety of colours and an almost unlimited diversity of design occurred.

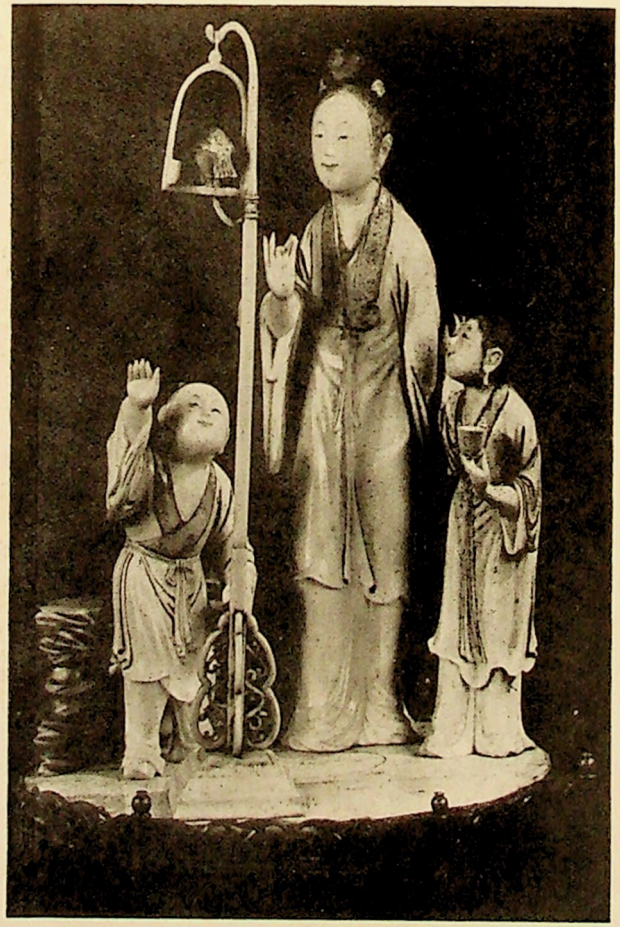
Another very important Peking art-industry is that of carpet and rug manufacture. This is also carried on in Tientsin and Shanghai.

An interesting art-craft that has developed in China in response to the demand for Chinese antiques is the manufacture of such articles. Carved stone heads of Buddha and Kwan-yin, with all the appearance of having been broken off some figure on the sculptured wall of a cave temple, are made by the score in Peking to-day; while clay tomb figures are turned out by the hundred in Honan. These have their value, of course, since they are remarkably fine replicas of the originals, which are so rare as to be difficult to come by. They have the virtue of being the means of disseminating a knowledge of the art of the ancient dynasties of China.

Before leaving the subject of the art industries of China, mention must be made of such introduced industries as the manufacture of Western style furniture. While this has been mainly developed by Chinese manufacturers, whose carpenters have copied Western designs with more or less fidelity, at the same time adapting them to a certain extent to the needs of the Chinese themselves, certain Western manufacturers of furniture have set up factories in such places as Shanghai, where they have been eminently successful, and can turn out furniture of the first quality in any style, ancient or modern.

Coupled with these furniture manufacturers are the interior decorators, of which there are a number of well organized establishments in Shanghai and Tientsin. They have been responsible for the development of a style in interior decorating and furnishing met with nowhere else in the world. It combines all that is most beautiful in Chinese art with the luxury and comfort of the West. That it is spreading to Europe and America there can be no doubt, and through it will inevitably be developed a demand for Chinese *objets d'art* that will call for a regular industry itself to satisfy.

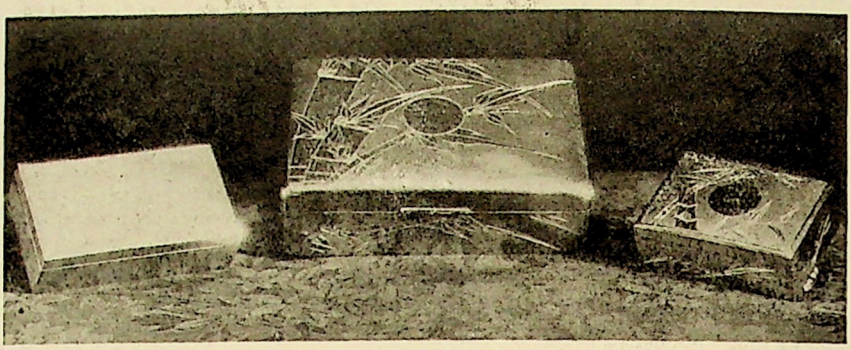
Chinese Art Objects for the Chicago Exposition: In spite of the



Remarkably fine Chinese Carved Ivory Figures at the Jade Store on Nanking Road, Shanghai.



A *Blanc de Chine* Porcelain Figure of Kwan Yin in the Jade Store, Nanking Road, Shanghai.



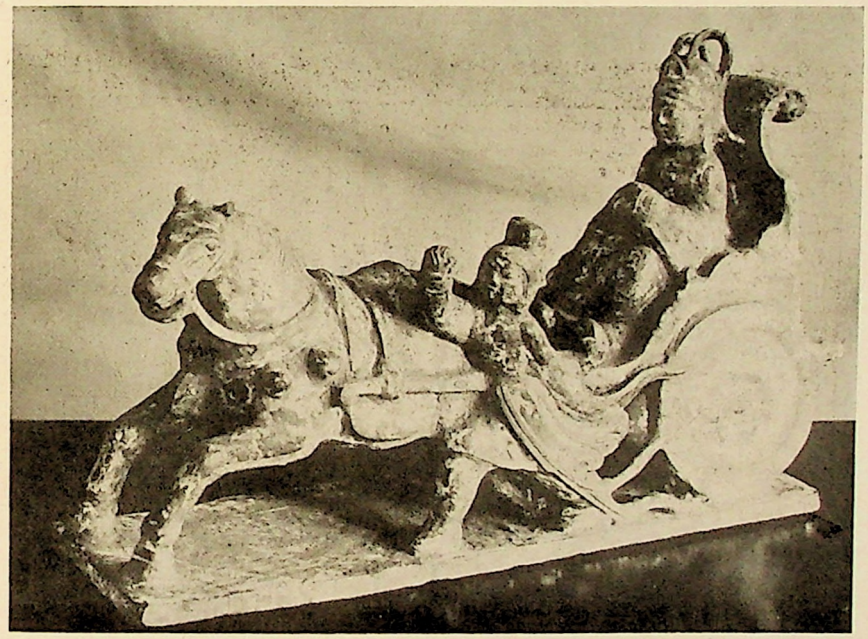
Lovely Silver Cigarette and Cigar Boxes offered by the China Jewellery Company, Broadway, Shanghai.



A beautiful and richly chased Silver Tea and Coffee Set offered by the China Jewellery Company, Broadway, Shanghai.



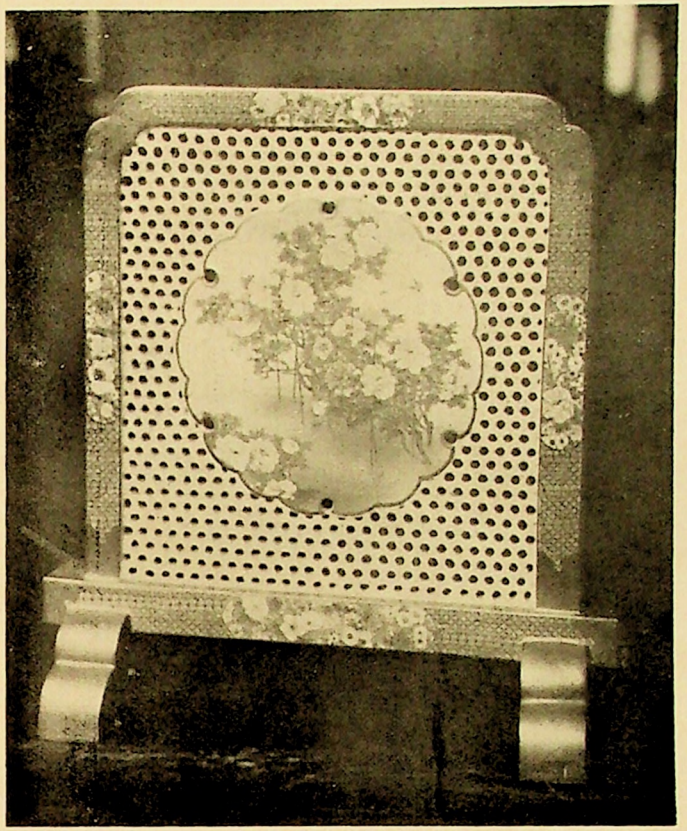
First Edition Woodcut Prints by the famous Japanese Artist Kitagawa Utamaro, A.D. 1753-1806. Art Objects of this Nature are to be had at Toyo Murakami's in Shanghai



Photos by Courtesy of Jean Lindsay's Studio.

A Stone Carving of a Horse and Chariot of the T'ang Dynasty, showing wonderful Life and Action, and indicating the high Standard Chinese Art had attained even in that early Period.





Beautiful Examples of the famous Satsuma Ware of the Japanese, the Vase on the Left by Seizan, the Screen on the Right by Kinkozan. Toyo Murakami, Shanghai.

cancellation of China's official participation in the Century of Progress Exposition at Chicago, scheduled to open on June 1, a large consignment of Chinese art objects, packed in something over six hundred cases, has been shipped to America for exhibition at this World Fair. China's official withdrawal from participation was announced some time back as the result of the political situation created by the Manchoukuo and Japanese invasion of Jehol in the north and the financial stringency resulting therefrom. The Chinese producers of the country's art works, who had already placed on exhibition in the new building of the Academia Sinica on Yu Yuen Road in the International Settlement of Shanghai a fine series of examples of their wares that had been selected for exhibition in Chicago, decided that if the Government could not afford the whole expense of the undertaking they would raise the necessary funds themselves rather than forego this splendid opportunity of showing the world at large what China can and does produce in the way of high grade art objects. This they have succeeded in doing, being assisted to a certain extent by the Government, with the extremely gratifying result that this country will be well represented at the Chicago Exposition.

Amongst the objects to be shown are jade and other semi-precious stone carvings, ivory carvings, lacquer work of different kinds and from different parts of the country, porcelains, silver ware, tapestries and other silk fabrics, red-wood carvings and the like. We believe that some truly remarkable pieces of jade carving have been included in the exhibits, so valuable that the owners dared not show them in the exhibition held in Shanghai. One of these is an eight-foot Pagoda carved out of a single huge block of apple-green jade. The Foochow lacquer figures will undoubtedly call forth considerable comment, as also will the magnificent wood carving from the same city. China's silver work has made great strides of late years, and it will be surprising if the exhibition of the examples sent to the Fair does not result in the placing of orders from America and Europe here in Shanghai. In fact, the manufacturers of Chinese art objects are to be congratulated on their far sighted policy in insisting on being represented at the Exposition.

A. DE C. S.

THE LIBRARY

PUBLICATIONS OF ECONOMIC IMPORTANCE IN CHINA

China is well served with periodicals of economic importance as the following summarized partial list will show :

Chinese Economic Journal.—This is a monthly journal containing articles on China's commerce, industries and finance. Issued by the Bureau of Foreign Trade, Ministry of Industry, Customs Building, Shanghai. Price $10.00 per annum. $1.00 per copy. Foreign countries Gold $5.00.

Chinese Economic Bulletin.—Dealing with the same subjects as the above and issued by the same office, this useful publication appears weekly and covers matters of more immediate interest, giving statistics and similar data. Price $10.00 per annum, 20 cents per copy. Foreign countries Gold $5.00.

Inspection and Commerce.—A monthly journal issued by the Shanghai Bureau of Inspection and Testing of Commercial Commodities, Ministry of Industries, 15 Museum Road, Shanghai. It is devoted to the improvement of foreign trade and domestic industry. Its contents are very similar to the two foregoing publications. Price $5.00 per annum. 50 cents per copy. Foreign countries Gold $4.00.

Finance and Commerce.—A weekly journal devoted to Chinese trade and finance, this is issued at 6 Kiukiang Road, Shanghai. Price $12.00 per annum.

The Far Eastern Review.—A monthly journal of engineering in the Far East, this also contains political and

other articles. 24 The Bund, Shanghai. Price $10.00 per annum.

The Shipping Review.—A weekly journal devoted to shipping and engineering, issued at 8a Yuen Ming Yuen Road, Shanghai. Price $10.00 per annum; 20 cents per copy.

Agriculture and Forestry Notes.—A monthly sheet issued by the College of Agriculture and Forestry of Nanking University, Nanking.

Besides the above mentioned periodicals the following other publications in China may here be mentioned as of economic importance.

Far Eastern Products Manual.—A practical commercial handbook of information on Oriental commodities essential to merchants, shipping and insurance companies and manufacturers, and deals with all the important commodities produced in and exported from Far Eastern countries. Selling agents, North-China Daily News and Herald, Ltd., 17 The Bund, Shanghai. Price $84.00.

The China Year Book.—Issued annually, and covering all matters of political, commercial, industrial and financial interest in China. In its extended form it has run over a period of ten years or more, and is a most valuable record. The 1933 edition will be out shortly. Published by the North-China Daily News and Herald, Ltd., 17 The Bund, Shanghai. Price $20.00.

The Architects and Builders Compendium.—Published by the same firm as the above. Price $5.00.

The China Hong List.—A business and residential directory for all China, published by the North-China Daily News and Herald, Ltd. Price $11.00.

REVIEWS

The Man who Went on Business, by Norman Tiptaft: Tiptaft Limited, Holyhead Road, Birmingham, 21, 1932. Price, 5s.

This is a book that every present day business man should read, no matter what his business or nationality. What the author has to say is sound common sense from beginning to end. It describes his own experiences on a business trip round the world, undertaken with the object of finding out for himself, as head of his firm, actual conditions in the countries he visited. He went after business, and, in spite of depressed conditions, got it. He got a great deal more. He got an insight into things that were a revelation to him, and, on the strength of this, his advice to other heads of firms is to go and study their markets for themselves.

His most important contribution is, perhaps, his plan for organizing an "Army of Commerce" as a nation would an army in the case of war; and while his plan is designed for the advance of British trade, there is no reason why it should not be generally applicable. Knowledge of what is required is the first essential in any attempt to capture the market in a given country. Publicity in the language of that country is the next, and then visits by competent salesmen. But "to undertake the study of the market and then to work it scientifically is obviously beyond the resources of individual businesses," he says, "therefore, it must be done collectively—as an army."

In his chapter on "The Politicians" he makes a strong plea for the placing of the running of the whole country's commercial affairs in the hands of a single high executive as manager, pointing out that managers have been tried in many cities with great success. He suggests that the remarkable increase in efficiency in national commercial methods that would ensue would provoke a demand for the extension of the system to educational matters, housing and the various services.

There is a great deal of food for thought in this little volume, and we are rather inclined to the view that the author, the man who went on business, has blazed a trail for the economic recovery of any nation that will follow his ideas.

Modern Birth Control Methods, by G. Ryler Scott: John Bale, Sons & Danielsson, Ltd. London, 1933.

"The object of this work is to review calmly and without prejudice the known methods of avoiding concep-

tion, to present the whole contraceptive armamentarium in cold array, to set out the advantages and disadvantages of each method, and to leave to the individual the final selection of the one most applicable to her or his taste and circumstances." Thus the opening paragraph of the Introduction of a book that, because of its economic as well as medical bearing, is reviewed here rather than in our "Medical Notes."

The question of birth control is one that is under the serious consideration of most Governments, at least in the West, how far to permit it, to encourage it or to prevent it altogether. With the present rate of increase of the populations in most countries, economic problems must become steadily more acute if matters are allowed to take their normal course. Germany, for instance, will have reached a population of 70,000,000 in 1960, and the United States of America a population of 144,600,000 in 1970, according to recent calculations.

We hold no brief for birth control, feeling that as now conducted it is more a menace than a benefit to the human race, since it is being used by the best instead of the worst elements in the communities. We suggest, as better ways of combatting the evils it tries to overcome, the encouragement of more careful selection in marriages and a better distribution of the world's inhabitants over the face of the earth, the former being the task of individual citizens, the latter that of Governments.

Since, however, birth control is being practised on an extensive scale, it seems a good thing that knowledge of the best and safest methods of contraception should be made generally available, even if the medical profession does not like the idea. Details of the book's contents do not concern us here. Those needing the advice it offers must read it for themselves.

Problems of Population, edited by G. H. L. F. Pitt-Rivers, B.Sc. (Oxon): George Allen & Unwin Ltd., London, 1932. Price, 15s. net.

Being the report of the proceedings of the Second General Assembly of the International Union for the Scientific Investigation of Population Problems, this volume contains matter of the greatest interest and importance to world economics. It is a book that every student of world affairs should secure, read and retain for reference. Even a casual perusal brings before the reader numerous interesting facts not normally coming within his sphere of knowledge. But its chief importance must be in aiding the Governments of various nations in guiding the destinies of their people. As an example, the future growth of the population of the United States is exhaustively dealt with, and the statistics given and the deductions based upon them cannot help being of assistance to the Government of that country in the present crisis as well as in the future.

Birthrate, fertility, population density, the structure of population, sex ratio, food supply and population, infant mortality—these are amongst the more interesting phases of the whole great subject dealt with.

We could have wished for a chapter outlining the present population of the world and its distribution, with a table showing the population of each country according to the latest census and its density. This kind of information is extraordinarily difficult for the average man to secure.

The meeting of the Assembly, at which the papers reproduced in this book were read, took place in London during June, 1931. The book is well documented and nicely got up and printed.

Japan: Mistress of the Pacific? by Colonel P. T. Etherton and H. Hessell Tiltman: Jarrolds Publishers London Limited, 1933. Price, 12s. 6d.

Those who have read "Manchuria: the Cockpit of Asia" by the two authors of the above book will welcome the appearance of their new volume, which presents a comprehensive survey of Japan in her political, industrial, financial and social aspects. It is a book which calls for careful study on the part of all who are interested in Far Eastern affairs, for it handles with great understanding and in considerable detail all that is involved in the rise to world power of the "Island Empire" of the Pacific. Having outlined Japan's internal needs,

the authors proceed to discuss her policy in satisfying those needs, as well as her attitude to the various other World Powers. Japan's "Hands off Asia" policy and her "Monroe Doctrine" for Asia are discussed in detail, as well as her avowed intention of forming a Japanese hegonomy in this part of the world. A friendly warning is given to Japan, veiled, perhaps, but there nevertheless, of the danger she is running of finding herself in conflict with the rest of the Great Powers, as other countries have done in the past to their cost, if she persists in the policy of continued expansion demanded by her army, which to-day is the deciding voice in shaping her policies.

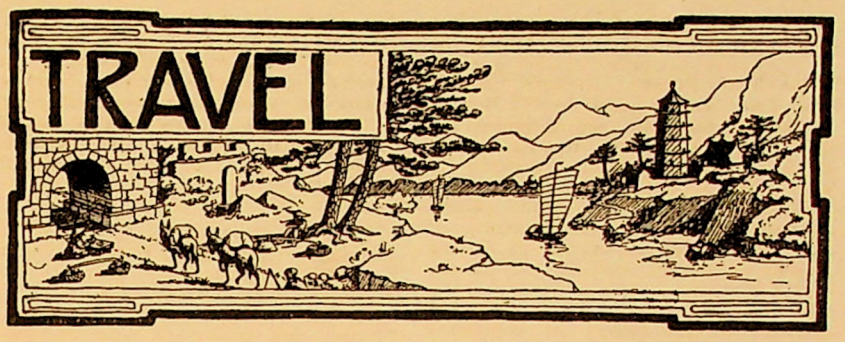
"It is more than likely that Geneva, having recorded its protest, will leave events to take their course. Yet it is by no means so certain that the hands of the two Powers most vitally concerned with the future of China—Great Britain and the United States—may not be forced, and the necessity for action against Japan imposed upon them, if not now, then in the near future, by the actions of Japan herself."

In view of such a contingency all right minded people would urge upon the Japanese an adoption of a conciliatory policy *vis-à-vis* China and the rest of the world, abandoning the chimera of world conquest for a policy of genuine cooperation with other countries in the Pacific region for the betterment of all nations concerned. Only in this direction lies true greatness.

Toward Planetism, by Roger R. Hawkins: Privately Published and Circulated. Printed by the San Yu Press, Peiping, China, 1933.

A missionary in T'ai-ku Hsien, Shansi, the author of this thought-provoking pamphlet offers a tentative plan for the solution of human problems. He has coined the word "Planetism" to cover the idea of world super-government. His handling of the whole idea is worthy of study, but it leaves a feeling of impracticability in many of the suggestions it contains. The main idea, however, is good. It cannot be said to be in any way new, though it may have originated independently in the author's mind. As a contribution to world problems it is to be recommended. Unfortunately neither the price nor where it can be purchased are indicated.

A. DE C. S.



THE DESERT AND THE SOWN IN CHINA

A SURVEY OF THE TOPOGRAPHY OF CHINA AND ITS BEARING ON THIS COUNTRY'S PRESENT ECONOMIC PROBLEMS

BY

ARTHUR DE C. SOWERBY

Although China is one of the most densely populated countries in the world, and by far the greater part of her people live upon the produce of the soil, there yet remain in the aggregate vast areas of uncultivated land, some of which is frankly desert or semi-desert, while the rest may be described generally as wilderness.

This great country, nearly 4,300,000 square miles in area, if we include Manchuria, and Mongolia, contains within its boundaries every kind of terrain, from the howling sandy wastes of the Gobi and Ordos Deserts to the luxurious semi-tropical rain-forests of the south, and from the flat alluvial plains of the east to the mighty mountain ranges of the west, where snow-clad peaks that rival those of the Himalayas tower above the mile deep valleys of the Tibetan border-lands.

Immediately south of the Gobi Desert lies what the Chinese call the *Ts'ao-ti*, literally "Grasslands," which can best be described as rolling grassy treeless steppes with low hills scattered about, the sheltered valleys of which sometimes harbour clumps of low bushes or even stands of red birch or poplars. The soil varies according to the geological formation, in some places being rich and fertile, the result of decomposed basalt or other basic rock. Shallow lagoons lie scattered over these steppes, all without any outlet, and, therefore, inclined to be brackish or even salty. The Chinese political boundary lies well to the north of the southern limit of this steppe-land, embracing the recently created provinces of Jehol, Chahar and Ninghsia.

At the edge of the great Mongolian plateau, which coincides with the southern boundary of the steppe-land, the terrain suddenly falls away in a labyrinth of rocky mountains and hills and deep valleys, rather barren in places, but wooded in others, and so on southward to the great alluvial plains of North China. This mountainous belt occupies a couple of hundred miles or so in Northern Chihli. In Shansi it extends from the Chahar area southward the whole length of the province, with a massive ridge of very high mountains, up to 10,000 feet in altitude, running from north to south down the western side of the province. Several big valley-plains occur in Shansi at altitudes up to 3,000 feet, the largest being the valley of the Fen River, which flows almost the whole length of the province from north to south, joining the Yellow River in the south.

The Ordos Desert may be considered as a huge southern extension of the Gobi, lying within the great northern loop of the Yellow River. It is for the most part a trackless sandy waste, unfit for human habitation. Its southern border coincides with that of Northern Shensi, and for a considerable distance south of this the arid conditions continue, the sand of the desert gradually giving way to the loess hills that are so characteristic of the greater part of North China. The loess country, though fertile when there is sufficient moisture, is inclined to be arid, and, where the strange yellow deposits lie on the limestone formation, which is also very prevalent in North China, it becomes at times so dry that all vegetation dies and wells and springs dry up, with the result that the inhabitants are forced to leave their villages and farmsteads and seek more favourable conditions elsewhere. For this reason the ruins of villages and deserted terraced fields are a common sight in these regions. Nevertheless, in some areas that have long been so deserted vegetation has managed to regain a foothold, with the remarkable result that favourable conditions, showing wooded landscapes with clear permanent streams flanked by grassy banks and meadows, have been restored. It would appear from this that to a very considerable extent the aridity of North Shensi and neighbouring Kansu is due to the vegetation, destroying activities of the inhabitants, though, of course, a certain measure of it may be due to the onslaught of the desert conditions from the north. This, however, is a point on which there seems to be some divergence of opinion. Whatever the cause, the fact remains that North China as a whole is inclined to be arid, long periods of drought often occurring and causing terrible famines, sometimes widespread, sometimes confined to more or less circumscribed areas. Yet, wherever the destructive hand of man is not felt, there is a definite tendency for woods and even forests to cover the mountains and hills. Great forests, for instance, used to exist in the Imperial Hunting Grounds of North-eastern Chihli, which were protected by the Manchu Emperors from the ravages of the farmers, but have practically been destroyed by the latter since the advent of the Republic. Magnificent forests still occur in the high mountains of Western Shansi, though the latest information concerning these is that they are being destroyed by farmers, who are forever seeking new soil. The whole of this vast area is suitable for the cultivation of

millet, kaoliang, wheat and soya beans, which form the staples of the population.

If the northern provinces of China, by which is meant Shantung, Chihli (now divided into Hopei and Jehol), Northern Honan, Shansi, Suiyuan, Chahar, Shensi, Kansu and Ninghsia, may be described as arid, then little short of desert is the only term to apply to the greater part of Sinkiang, or Chinese Turkestan, which is China's "Great North West." This is a huge stretch of country extending like a great arm into Central Asia, which has become more or less settled by emigrants from all parts of China. Although in places it is fertile, for the most part conditions are far from favourable, the country partaking very much of the nature of Mongolia and the Ordos, where the rainfall is meagre and vegetation scanty.

Manchuria, on the other hand, is a country of immense forests and rich pastures, where there is an abundant rainfall and farming conditions are more favourable than anywhere in China Proper. It has always attracted great numbers of settlers from China, who have for the most part done extraordinarily well.

This semi-arid territory of North China coincides roughly with the basin of the Yellow River, the southern rim of which is the northern rim of the Yangtze Basin. The latter occupies the greater part of Middle and West China. It enjoys a mild more or less humid climate and on the whole is wonderfully fertile. The hills and mountains are covered with thick vegetation of some sort or other, never being barren as they so often are in the north. Here begins the rice-culture belt, and while wheat and other cereals are extensively grown, rice may be considered the real staple. This, of course, means plenty of water. The hillsides in this area are not, perhaps, as intensively cultivated as in North China, and brush and scrub is allowed to grow to a far greater extent. The lower levels of the hills, the valley bottoms, and finally the rich alluvial flats of the big river valleys, including the Yangtze itself, afford the population abundant harvests. Seldom do famine conditions prevail in this fertile area. The only serious danger is caused by too much moisture, which may produce devastating floods, as occurred in the summer of 1931.

The eastern section of the great Yangtze Basin ends, as does that of the Yellow River, in wide alluvial plains, but in this case the plains are irrigated by a vast network of canals and creeks. And it is here that China's population is thickest, for the heavy black soil of these well watered flat-lands yields a succession of rich harvests, rice, wheat, cotton or beans and market garden vegetables in turn.

In the western section of the Yangtze Basin, in the great river valleys and high mountain ranges of Kweichow and Szechwan, the population is also very dense, since the abundant rainfall ensures luxuriant growth in the steaming valley-plains. Here, in the mountains, wild vegetation is rife and vast jungles and forests occur.

The middle section of the Yangtze Valley consists of extensive well-watered flat-lands, with a number of great lakes. Besides the farming population there is an enormous population living entirely in boats in this

area, earning a livelihood by carrying produce or by fishing. This water-borne population extends right down to the mouth of the Yangtze and all over the delta of this river. It is to be found also throughout South China, where conditions are very much the same as in the Yangtze Valley, except that there is still more moisture and the climate is hotter, even tropical. The uncultivated areas of West, South-east and South China are to be found only in the hills, but there are hardly any barren places. Sometimes open grassy stretches are to be found high up, but usually, where the mountains and hills are not forested, they are covered with bamboo, sword-grass and other kinds of jungle.

The whole of the south from the Yangtze Valley to Indo-China is hilly or mountainous, with wide fertile valleys marking the courses of innumerable rivers, and supporting an enormous population. In many places extensive forests occur, and there are some regions which can only be described as wilderness, not having get been explored by foreigners or even Chinese scientists.

The mountains of Fukien are now or have been in the past extensively used for rice-growing. They have been intensively terraced for this purpose, the necessary water having been drawn from the perennial mountain torrents that occur. In some areas, however, the human population has vanished, leaving the terraces to become once more covered with the jungle or forest, as the case may be. There are two explanations offered for the vanishing of the population of these deserted areas, one being the call for Chinese coolie labour in the Malay regions, the other the attacks of pirates from Formosa. The latter might account for the disappearance of the population in the hills along the coast, but not for the wholesale evacuation of fertile areas in the interior. It is interesting to note, however, that in many districts the deserted areas are being settled once more.

Disease is rampant throughout South China, malaria, schistosomiasis and the like taking a heavy toll of the people and undermining the health and vitality of those that survive. The excessive moisture and warmth naturally conduce to this state of affairs, so that the fertile south is not, perhaps, as desirable a place to live in as the arid north.

The significance of China's topography is that there are vast stretches in the north and north-west where arid conditions prevail and the population is scattered ; while the moist and fertile central and southern regions are over-populated. There is evidence to show that waste places of the north and north-west might be reclaimed if the right means were adopted, such as afforestation and irrigation. If this were done, the terrible congestion of the central and southern areas might be relieved. There is also ample evidence to show that the extensive hilly and mountainous areas of the west, centre and south, now given over to profitless scrub, swordgrass and other jungle growth, might very profitably be brought under cultivation and settled.

In other words, China as she exists to-day, is like the world at large. Topographically she is all that could be desired ; there is room for the whole of her four and three-quarter hundred million inhabitants. Yet

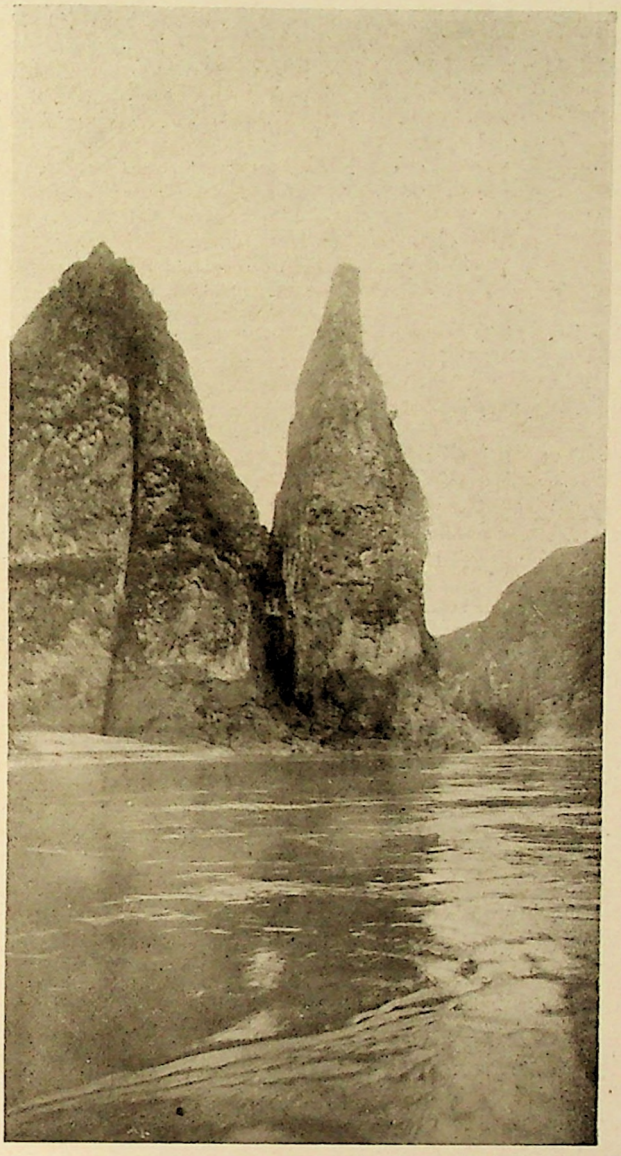


Photo by A. de C. Sowerby.

A Scene on the Luan River, Jehol, in the Area where military Operations are taking Place.



A delightful scene in the Imperial Hunting Grounds in the Jehol Region before the Timber was cut away by farmers who were allowed to come in after the Manchus were deposed.

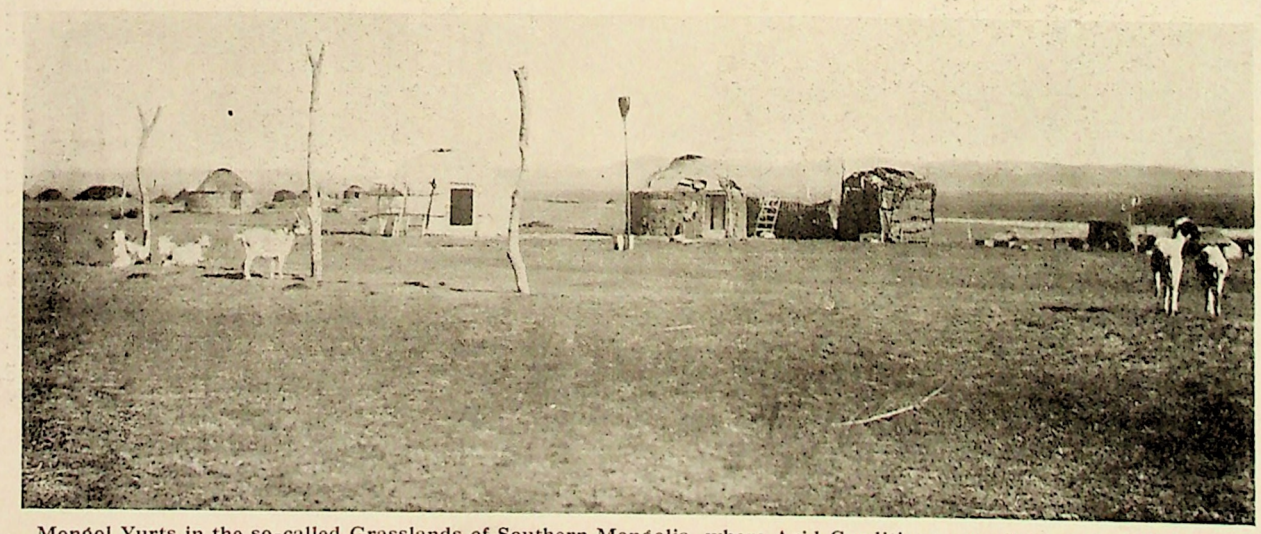


Photos by A. de C. Sowerby.

Remarkable Geological Strata on the Luan River in the Jehol Region.



Rice Culture in the fertile Yangtze Basin. This View was taken in the Country of the Miao Aborigines of Kweichow Province.



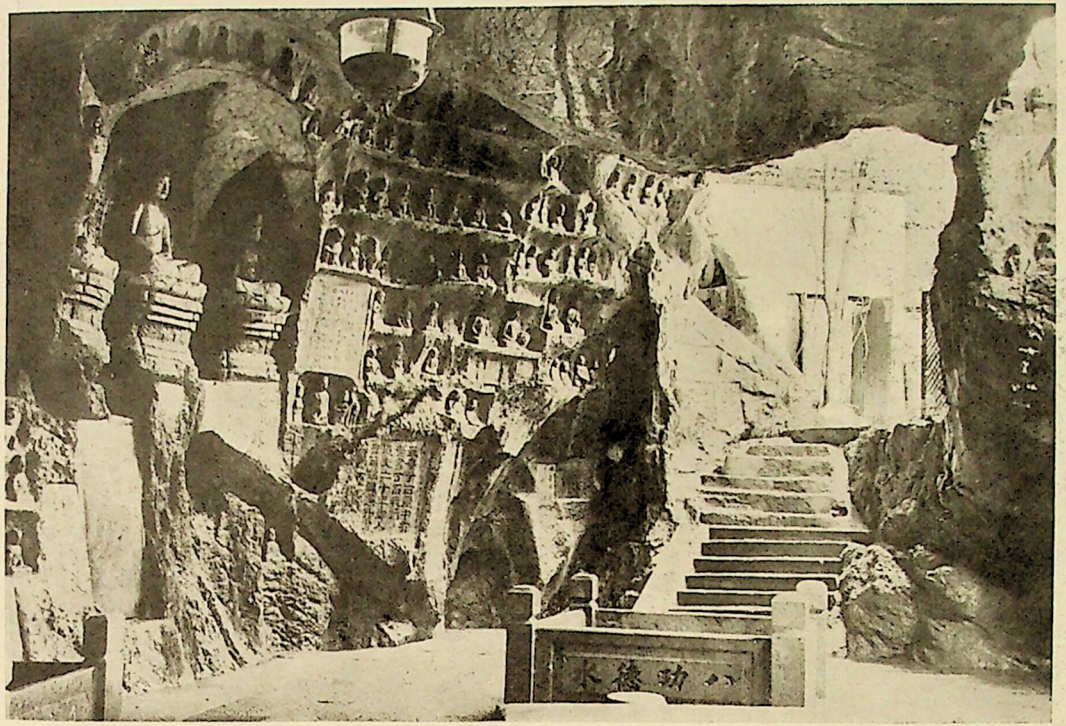
Mongol Yurts in the so-called Grasslands of Southern Mongolia, where Arid Conditions prevail in marked Contrast with the Humid Conditions of the Great Yangtze Basin in China Proper.



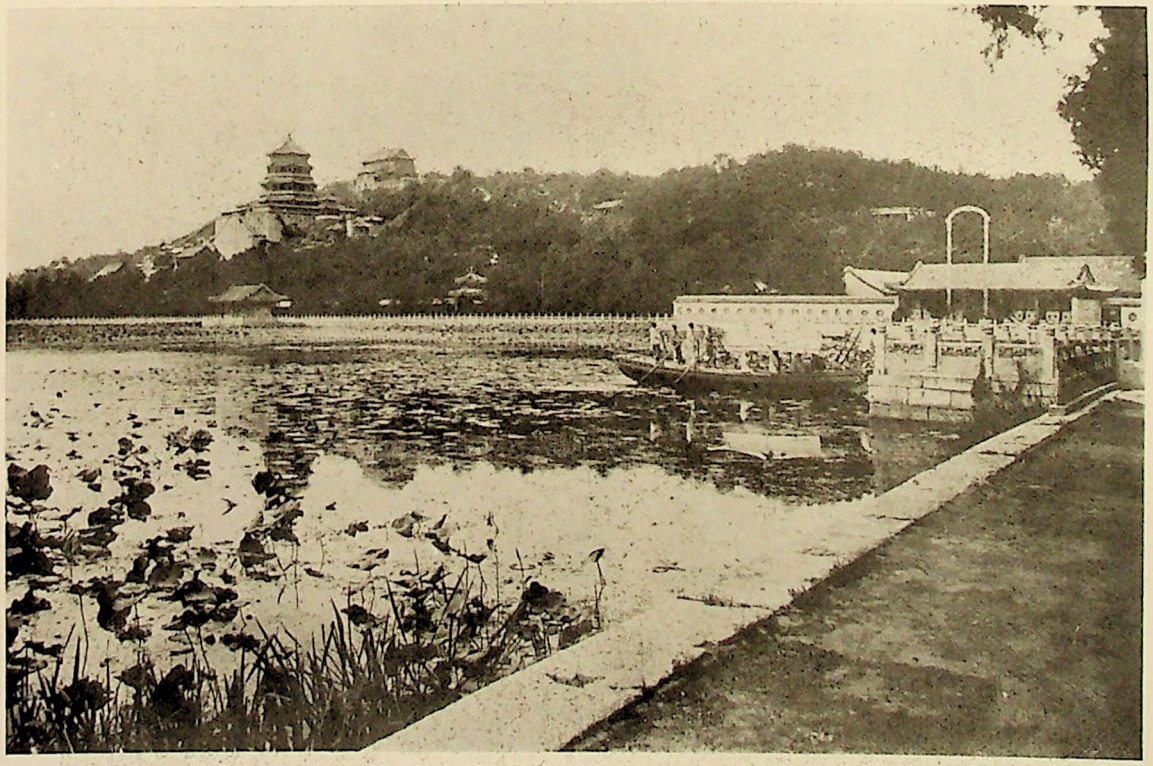
By Courtesy of the China National Aviation Corporation.

SHANGHAI FROM THE AIR

This remarkable Picture of Shanghai taken from the Air shows Part of the Central or Business Section with the Towers of the Cathay Hotel, the North-China Daily News Building and the Chinese Customs Building along the River Front. The Section of the Whangpoo River here shown is known as the Garden Bridge Bend. In the Background lies the Industrial Area of Yangtzepoo and on the Right that of Pootung, which lies across the River.



The Cave of Morning Mist, also known as the Stone House Cave, at Hangchow. This interesting Photograph was shown by Mr. J. H. de Carvalho at the Fourth Annual Photographic Exhibition of the City Bank Club which was held early last October in Shanghai.



The Lake in the Summer Palace near Peking.



Photo by Pierre Chollot.

The River near the beautiful Home of General Chiang Kai-shek at Feng-hwa in Chekiang.

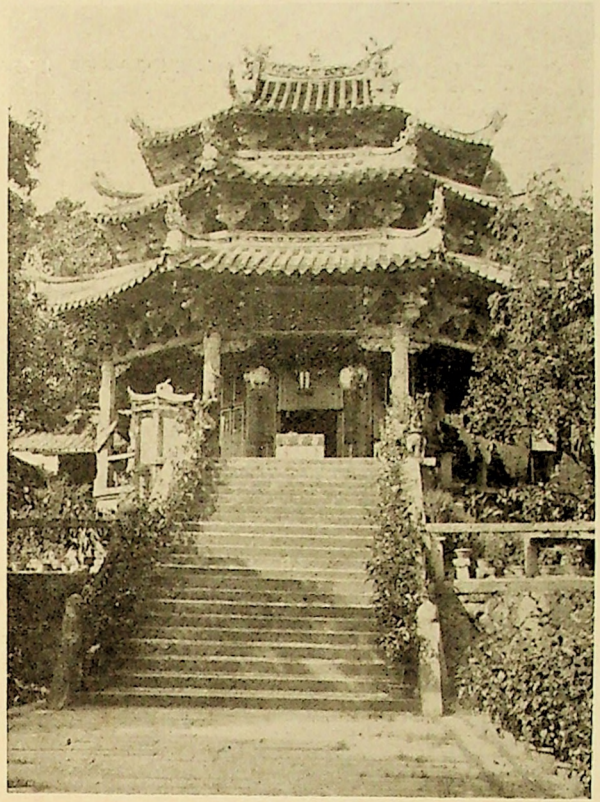


Photo by T. E. Rees, O.B.E.

The Nam Pau Tau, a Buddhist Temple in Amoy, Fukien Province, South-east China.

beside the sown is the desert, largely man-made, and congestion in the fertile areas keeps the whole population down to a low economic level, when, by a judicious redistribution of the latter and the occupation of the present waste places, there might well be plenty for all.

TOURISM AN ECONOMIC FACTOR

One of the greatest developments of the modern age is that which has taken place in the various methods of rapid transportation. This, in turn, has developed to an enormous extent what has been termed tourism, a rather ugly-sounding word for a form of recreation that has become extremely popular with the moneyed classes of the world.

It is important from the point of view of the satisfaction of the individual involved to distinguish between the traveller and the tourist. The traveller is one who is travelling from one country to another on business of some sort, or who is exploring little or unknown regions of the earth's surface ; while the tourist is one travelling merely for the pleasure of travelling, or of seeing new places and strange things and peoples. Perhaps three categories should be made, a separate one being given to the explorer and scientific investigator and collector.

But from the economic point of view it matters little what are the reasons the countless numbers of people, who now travel on steamers or trains or aeroplanes, have for making their journeys, they all have to spend money, not only to pay for their passages, but also for food, accommodation and many other things in the countries they visit, and for this reason they one and all form items in an extremely important economic factor in modern life.

Doubtless the tourist, from the point of view of distributing surplus wealth is the most important. Indeed, some countries derive a very substantial part of their annual income from tourists. It would be interesting to know, for instance, what amount of money tourists and holiday makers actually bring into Switzerland. How much do her cherry blossom season, her geisha girls and her innumerable temples bring into Japan in the form of travellers' cheques every year ? Certainly in both cases far more than the commercial traveller or the explorer. It would be even more interesting to know what in normal times is the total amount of money spent on travelling for pleasure throughout the world. As a means of circulating money we can think of nothing better than tourism, for not only does it cause the flow of this commodity from one person to another, but also from one country to another, taking it from where it is in excess and carrying it to where it is more needed.

For this reason any country that boasts a "tourist trade" is fortunate indeed.

China is a country where the potentialities in the tourist trade are far in excess of the actualities. This is due to three main causes: one, the fact that the beautiful and interesting places of this country are not generally known abroad; the second, the lack of easy means of communication between the ports and these beauty spots; and the third, the fear on the part of possible visitors from abroad of disturbed political conditions.

Those who have travelled extensively in the interior can vouch for the facts that China is full of places of the greatest interest and that her scenery is as magnificent as any in the world. The massive forest clad mountains of West Shansi, with their infinite variety of greys, mauves and blues as they rise tier upon tier to the far distant horizon, are unrivalled for sheer loveliness. The even more imposing ranges of South Shensi and the Tibetan borders are little short of the Himalayas in their grandeur and certainly equal the Canadian Rockies. The sacred peaks of China, T'ai Shan in Shantung, Wu-t'ai Shan in North Shansi, Hua Shan in Shensi, O-mi Shan in Szechwan, with their ancient monasteries and temples, offer an interest that few mountain resorts elsewhere in the world can provide.

And where in the world, except, perhaps, the Grand Canyon of Colorado, is there anything to compare with the stupendous gorges of the Upper Yangtze, the Mekong and the Salween in far away Yunnan, where these three rivers by some strange freak of nature run parallel within a few miles of each other and the Irawaddy in neighbouring Burma, for a distance of two or three hundred miles before separating to empty their waters into the sea thousands of miles apart?

Egypt has her "Valley of Kings," but China has her more wonderful cave temples of Lung Men in Honan and Yung Kang in Shansi, where mighty figures, carved out of the living rock centuries ago in the T'ang Dynasty, outrival anything of their nature in the world.

These, however, are all beauties and wonders that lie far from the great ports where tourists land in China, and, though for the most part actually within reach of railways, call for more time to visit than can usually be spared by these birds-of-passage. Nevertheless, were China in a more settled political condition, there is no reason at all why they should not be included in the itineraries of the various tourist and travel agencies. But there are many places remarkable for their scenic beauty or historic interest within easy reach of such ports as Shanghai. Hangchow, with its Lin Ying Monastery, its Cave of Morning Mists, its lovely West Lake, is worthy of a visit from any Western traveller. Further south in the same province, Chekiang in the vicinity of the homes of China's greatest scholars and poets, there is scenery that is as exquisite as the most exacting could demand. Hangchow can now be reached by motor-car in a few hours. Soochow, with its quaint gardens, pagodas and lovely hills surrounded by smiling farm-lands and winding canals and overlooking the T'ai Hu, a lake famous for its beauty, is within a couple of hour's railway journey. Nanking, the

present capital of the country, lies another few hours west on the same railway, and, besides the mausoleum of the founder of the Chinese Republic and various other imposing modern buildings, offers the tombs of the Ming Emperor's of China as a place of interest to the visitor.

There is no need to dwell upon the attractions, from the tourist's point of view, of Peking, now called Peiping, the former capital of China, which is reached by a three-hour railway journey from Tientsin. Temples palaces, parks, ancient treasures and works of art, curio shops, rug factories—all combine to make this great city the Mecca of tourist travel in the Orient, and long will it remain so, in spite of the fact that recently the Palace Museum treasures have almost all been shipped to Shanghai for safe storage, in case the Japanese and Manchoukuo troops should attack the old northern capital.

Shanghai itself at present does not offer as much as could be desired to the visitor wishing to see something of the real China. At present there is no museum or art gallery where the ancient art treasures of this country might be seen, but it is hoped that in time this notable defect will be remedied. There are no interesting temples or monasteries in the immediate vicinity of this great city, which has little or nothing behind it in the way of ancient Chinese tradition, having been developed mainly by European commercial enterprise from a small trading centre in less than a hundred years. There is certainly no scenery to boast of in the surrounding country.

Nevertheless, Shanghai has its attractions, one of which is its wonderful shops, both foreign and Chinese, where the visitor may see and purchase the best kind of ancient and modern Chinese art objects, genuine antiques of every description, carefully selected by experts, beautiful Peking and Tientsin rugs and carpets, gorgeous silk fabrics, and the daintiest of embroidered silk and lace underwear.

If, however, the tourist trade of this city is to be made worth while, something must be done to provide attractions, which will justify a longer stay here than is at present usual on the part of visiting world-touring passenger steamers. It might be suggested that the various Municipalities should give this matter their urgent attention, and so help to improve the city's economic status by taking advantage of the benefits offered by tourism.

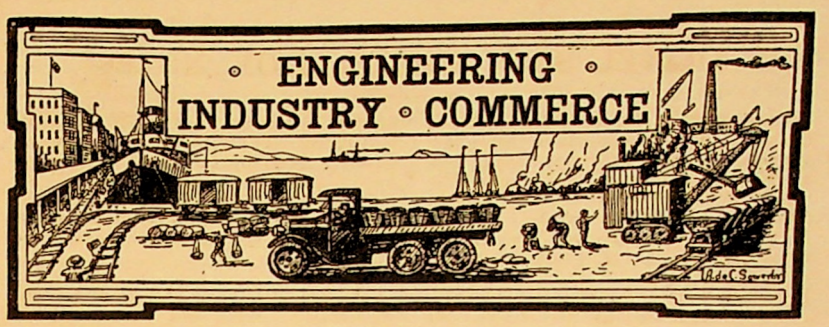
The same, of course, applies to the rest of China, for there is no reason to doubt that if favourable conditions prevailed this country would soon become a happy hunting ground of tourists from Europe, America and Australia.

TRAVEL AND EXPLORATION NOTES

Explorations in South and West China : At present there are two expeditions under way in China, one in Kwangsi in the south and the other in Szechuan in the west. The former is being carried out by Dr. Albert N. Stewart, Mr. S. Y. Cheo and Mr. C. H. Cheo on behalf of the University of Nanking and is of a botanical nature, being a continuation of a programme to investigate the flora of this country, the first part of which, consisting of an expedition into Kweichow Province was described in recent numbers of *The China Journal*. The expedition in Szechuan is being conducted by Mr. Jack Young, who was on the Kelly-Roosevelt Expedition of 1928 and the recent Sikong Expedition, when a party of Americans made the ascent of the mighty Minya Gonkga last August. Mr. Young's present undertaking is sponsored, we believe, in part by the Academia Sinica in Nanking, and his attentions are being directed mainly to the fauna of the country he is exploring. He has recently been heard of as having reached Ta-chien-lu after having made his way from Ya-chou on the Min River through the Moupin district, a wild mountainous country famous as the home of the giant panda and many other rare animals originally secured there by the great missionary-naturalist l'Abbe Armand David. Mr. Young is a Honolulu-born Chinese, who has taken up exploration work in his native land, so far with considerable success.

Mount Everest Climbing Expedition : With the success of the attempt to fly over Mount Everest on April 3, interest is now concentrated on the much more difficult and hazardous attempt that is being made to reach the summit of the mightiest peak in the world on foot. The latest news received here of this expedition, which is being led by Mr. Hugh Ruttledge, is to the effect that all communications with the party have been cut off by several days' heavy snowfall. This news was dated April 27. The *Reuter* message which brought it went on to say that it was probable that the climbers had reached the sixth camp above the Rongbuk base camp, leaving only two more camps to establish before making the final ascent to the summit of the peak.

A. DE C. S.



SOME PROBLEMS OF INDUSTRY

BY

SIR HARRY McGOWAN, K.B.E.

The following important survey of industrial affairs as they exist in Great Britain and the British Empire to-day, made by one who is at the very heart of such affairs, Sir Harry McGowan, K.B.E, Chairman of the Imperial Chemical Industries Limited, in a speech last December at the Ramsay Memorial Dinner in Glasgow, is reproduced here as it has a very definite bearing upon the whole economic and industrial situation of the world, and carries a special message for China in this country's economic and industrial development that is just beginning.

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I am not an expert in science or technology, but in the course of my work I am naturally much concerned with both. Day by day I am made keenly conscious of the results of scientific work and of the transformation of world conditions achieved by its brilliance. The difficulty is not to use new knowledge but to assimilate it smoothly to other conditions.

Sometimes the industrialist may be forgiven for feeling that science moves too fast for the convenience of the necessarily slower functions of industry. Manufacturing plant and machinery are designed and intended to endure over such a period as will permit of their cost being provided out of the annual profits they return. To-day, however, the manufacturer, when weighing the pros and cons of installing new plant, whether for the extension of existing processes or for developing new products, is a little haunted by the possibility that new scientific discovery or technical development may shortly reveal more economical methods of effecting his purpose. As a safeguard, liberal provision for obsolescence becomes a cardinal point in financial policy. But heavy expenditure on scientific research must not be withheld. Indeed its necessity is perhaps increased rather than diminished.

Chemistry has been singularly fortunate in the attraction it has had for high degrees of genius. I have no doubt that our present economic and industrial difficulties will in their turn attract high scientific ability on the commercial side. The weapon of scientific method, with its patient, persistent enquiries, will ultimately succeed, though the waiting period of its development may sometimes chafe the impatient. The proof of this belief lies not only in our knowledge of past achievements, but also, as far as I am concerned, in the growing progress which comes to my notice in day-to-day work upon immediate problems. The processes with which I am familiar are constantly being improved, and though each improvement may seem small in itself, the cumulative effect over a short period of years is impressive. Equally, in the development of new processes for the substitution of synthetic goods for natural products, the advances that have been achieved under my own eye are remarkable.

Now let me turn to the commercial and industrial picture. While in some parts there has been a startling change for the better, in others the position has grown worse.

For the six years ended in September 1931 our international trade was unstable. During that period, the British market was a good place for the foreigner to sell in but it was often not one in which he cared to buy. Since international sales and purchases are paid for mainly by clearing bills of exchange against one another, the excess of imports pressed down the value of the pound sterling in terms of other currencies. To prevent the export of gold, the Bank of England, responsible for maintaining the gold value of the pound, was forced to use a monetary remedy. The inducement of a higher Bank Rate was offered to foreign exporters to leave invested in this country sterling coming into their hands. While this policy was successful for a time, it created an unstable position, because these moneys were not converted into permanent investments but were left on short term maturities. It is now familiar knowledge how a decline in confidence led to the withdrawal of short term balances on such a scale as to make us suspend gold payments.

Let us look at some of the reasons why things are now better. The abandonment of the gold standard attacked part of our troubles. British exports, comparatively too dear when quoted in terms of gold, became cheaper through the depreciation in exchange which followed. They were put on terms not only of equality with foreign quotations but also of some advantage. While the export trade of the world has since September 1931 continued to fall, the decline in British exports has been somewhat less—judged in the only medium available, namely, that of values.

Just as our exports became cheaper by this step, so all imports tended to be made dearer. In some part, however, that increase in import prices was restrained by the fall in gold prices caused by our leaving that standard. The institution of tariffs, however, reinforced the restriction of imports so that in the year following September 1931 the rate of fall in value of British retained imports has exceeded that of the eighteen principal industrial countries. These two steps have,

therefore, largely arrested the decline in British industrial conditions. They have not, however, been strong enough to raise the deadweight of the downward tendency of world trade. But there have been certain reliefs from the economic pressure of the abnormal fall in prices of the past few years. The reduction in the volume of trade has freed so much money that excessive money market funds have brought the current rate of interest down to the usual low crisis-level. The Chancellor of the Exchequer has thus been able to carry through National Debt conversion operations of an unprecedented magnitude and unequalled success. Great economy has thereby been effected in the annual service of the National Debt. This triumph might have led in the next Budget to some reduction in the burden of our taxation, but other unfortunate events may now preclude any such relief. Budgetary and industrial difficulties are common to both the United States and Great Britain. A wise and sympathetic understanding may, therefore, still permit of future arrangements which will not deprive us of some reduction in our fiscal burden.

Industry has, however, gained a little by new capital issues and though they may only have replaced former commitments, the fall in interest rates means a welcome economy. When the last vestiges of the present capital embargo have disappeared, I hope that investors will not hesitate to transfer their present liquid resources from barren bank deposits to the fertile field of sound industrial development. In the meantime may I remind them that every restraint on normal spending strikes directly at the market value of their existing industrial holdings ? Every reduction in the use of purchasing power shows its effects in rising industrial losses. Wise expenditure, productive of a more efficient industrial structure, or of a healthier, happier people, whether springing from an individual, corporate or public purse, must ultimately add to our welfare.

In the world at large there has not been a like measure of relief from the burden of interest on international debts of all descriptions. The same amount of money has to be found out of heavily reduced prices received for products sold to meet that interest. Every borrower, whatever his status, places a high value on his reputation for meeting his obligations. That is the security which he must offer in the future should he need further financial assistance. It is, therefore, natural that every effort has been made to avoid falling into default. For that purpose country after country has imposed harsh restrictions on the volume of its imports, while at the same time it has not hesitated, by means of bounties, etc., to use exceptional methods for stimulating exports. It is not surprising, therefore, that the volume of international trade has shrunk enormously.

A difficult task lies before the coming World Economic Conference. Its principal purpose is to find a solution of these interrelated problems of unaltered interest burdens and disastrously low prices for the staple commodities of world trade which have directly led to the present network of monetary and fiscal restrictions upon international commerce. I trust that representatives of various countries who will meet in this Conference may be given the necessary wisdom and foresight for such

international co-operation as may once again start the wheels of industry on a prosperous basis.

Apart from world difficulties, British industry has also its own special problem. We have to enquire why the United Kingdom's share in the world export trade has shrunk so much in the post-war years. As the Royal Commission on Unemployment Insurance has said : " Loss of markets and decay of old industries was not a new experience ; what is new is the failure of new industries to compensate with the decline of old—a failure that must be overcome before any permanent recovery in employment can take place." In my view this loss of competitive power is largely due to the fact that British industry has not kept pace in recent years with progress elsewhere in industrial organization. There has been and still is a tendency to be contemptuous of the idea expressed by the word " rationalization." Admit, if you will, that it is an ugly word, that much has been said in its name which is unreal, yet it is still true that it represents a principle of great value.

The word may be new but the idea is old. Its origin is hard to trace, but speaking only of recent times, the last half of the nineteenth century has given us, side by side, a progressive growth in the subdivision of human labour and in the aggregation of small capital. The fruit of these two developments is to be found to-day in many countries in the form of large-scale organizations, controlled and working through a highly articulated and powerful but flexible form of team-work, operating over a world-wide field with enormous financial resources. Any unfamiliar visitor to a large modern factory may well be astonished at the pitch of perfection which has been reached by co-ordinated mechanical processes. In my opinion, however, an even greater achievement is presented by a large modern industrial organization which reveals the smooth and efficient co-ordination of the mental and physical efforts of tens of thousands of human beings, all of whose work is proceeding in harmony to a series of directed ends.

The power and influence of such organizations are enormous. In my view they are not yet sufficiently recognized in this country. In certain directions we are behind our international rivals. The cause is partly to be found in our history, partly in our conservative characteristics, partly in the qualities which, in the nineteenth century, brought Great Britain to the forefront as an industrial nation. During a period of expanding activity and growing prosperity, of widening markets and of the far-reaching application of numerous new processes and inventions, the organization of industry, through the medium of small and moderate-sized businesses, was undoubtedly an advantage. This system fitted admirably the British instinct for individuality. It permitted a nation, fertile in ideas, adventurous in disposition, plucky in taking risks, willing to embark its capital in overseas enterprises, to ring the world with its investments and fill the seas with its merchant ships.

In these modern days, however, the picture is quite different. Knowledge knows no international boundaries. Though we have undoubtedly led in some directions, others have been quick to follow. Perkin's discovery of dyes was neglected here but developed abroad

instead. In some countries science has found followers more devoted even than ours, and patient, organized research, sustained as much by love as by money, has shown results which a more impatient mentality did not achieve. However this may be, Great Britain in the twentieth century faces a circle of competing countries, many of which are mechanically and mentally as highly equipped as our own. In contrast to what we are told in the book of Ecclesiastes, the race is now to the swift and the battle to the strong. With the aid of a tariff we stand on equal terms with others ; with the aid of a depreciated currency, we may indeed stand, for the time being, on somewhat better terms. But that will not last indefinitely. We cannot, therefore, afford to let the organization of our great industries be outdistanced by that of other countries.

For geographical, climatic and geological reasons it will always be to the advantage of the world to conduct a considerable volume of international trade. But, coupled with that necessity, we must recognize and meet for many years, I think, the natural desires of great nations, and even small ones, to use these powers in such a manner that their national life presents fairly well-balanced industrial and agricultural activities. It is not unnatural that agricultural nations should seek to establish within their boundaries such manufacturing industries as appear suitable, if only for the greater opportunities and the larger pecuniary rewards that they bring. No matter how suitable a country may be as a whole for food production, it will contain men whose wealth, ability and disposition can only find satisfaction in manufacturing industries. National pride is not slow to foster this ambition. When, therefore, the present depression has passed away and international and national business activity is restored to a more normal level, we have, I think, to look forward over a long period of years to some diminution in the volume of international trade in manufactured goods.

If this view be correct, its greatest effect will fall upon our own country. It is here that the greatest readjustment will have to be made. As I see it, the intermediate stage will be one of co-operation between British capital, British industrialists and their foreign *vis-à-vis*. In place of British exports to many countries we shall see industries established on the spot by joint native and British activity. British savings will be directed towards further foreign investment for this purpose and for a time the manufacture of the plant, etc., through which that export of capital will take place will provide employment for our people. But, at the same time, unless economic nationalism shrinks before wiser counsels, there is bound, in many present exporting industries, to be a diminution of activity with a consequential reduction in the present value and volume of invested capital. We have, therefore, before us I think a great financial and industrial problem. It is for these reasons that I consider a far greater measure of industrial organization is necessary.

The absorption of small and medium business units into large organizations extends the field of view, so that long-dated policies can be more efficiently carried out. Opportunities and possibilities can be more accurately surveyed. Knowledge must be the prelude to action. Scattered units of an industry hinder any general view. A unified

organization provides it immediately. Decision is also quickened and execution expedited. The pooled financial strength of aggregated business units outdistances their previously distributed power.

As means of communication improve, distances shrink, and world markets tend to become one. Contact between great industries in different countries naturally becomes closer, so that the future is likely to see more and more world arrangements designed to secure the most efficient results from the greater powers of production that science has placed at our disposal. There will be a growing tendency to divide amicably what is to be shared.

At the risk of some further criticism I still hold to the suggestion I made on the occasion of the Jubilee Dinner of the Society of Chemical Industry, that we need above all things one Minister of State who will devote all his time and attention to promoting the co-ordinated reorganization of British industry. I asked that he should have some rare qualities: a knowledge of finance, economics and statistics; a hard sense of practicalities, drawn from active industrial experience, with wide human sympathies, sensitive both to the aspirations of labour and the requirements of invested capital. Nevertheless, I believe that he could be found and that his value to the country in dealing with the great financial and industrial problems to which I have referred would be worth the utmost that we could pay him. In my mind there is no doubt that every existing Minister is thoroughly overworked and there is plenty of room and urgent need for an appointment of this character.

When I expressed this view before I was somewhat misunderstood. There is no idea in my mind of Government Departments running industry. What I want is cooperation not interference. In present and coming conditions, however, it seems to me that the State will inevitably be more and more concerned with the development of industry and trade by reconciling divergent interests, ensuring that fresh liquid supplies of capital are attracted to their most efficient use, and promoting a closer contact between banking and industry. Echoing what the Macmillan Committee has said of finance, my considered view is that we have "reached the stage when an era of conscious and deliberate management must succeed the era of undirected natural evolution."

Let me finish on a note of encouragement. The trade of Imperial Chemical Industries provides a fair index of what is going on in other industries in the country. If our customers are not busy, then there is a reflex in our activities, but I am glad to say that the sales of our heavy chemicals during this year in this country have been on quite a satisfactory scale considering the world depression. From our contacts I am inclined to the opinion that there is a distinct upward trend.

The imposition of tariffs and the results of the Ottawa Conference, coupled with the obvious necessity and desire on the part of our industries to become more efficient than ever before, gives me hope that, when fundamental international problems are more or less settled, which I believe will be accomplished at not too distant a date, this old country of ours, of which we are all so proud, will again lead the world as it has done in the past.

TECHNOCRACY AND THE DOUGLAS SYSTEM OF SOCIAL CREDIT

BY

E. F. HARRIS

The following essay was delivered in the form of a speech before the Shanghai Rotary Club on January 5, and, although it has already been published elsewhere, it is felt to be of sufficient interest in its bearing on present-day world economic conditions to reproduce here. Especially do we recommend it to the consideration of the leaders in China, in the hopes that it may assist them in the regulating of this country's economic affairs in such a way as to avoid the evils that have befallen the rest of the world.

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What's in a name ? A rose by any other name would smell as sweet ! Precisely ; it might smell, but would it sell ? And in selling the name is all important. We must congratulate the proponents of " Technocracy " in having selected an excellent name for the system which they are suggesting as a panacea for the economic and social ills of the world.

Perhaps, however, the name was too good, for it enabled them to crash on to the front page of the press of the United States long before the Technocrats had completed their investigations or evolved anything in the nature of a positive and practical solution that would stand scientific scrutiny or investigation.

If it is true that there has been in the past a conspiracy on the part of those who control and benefit by the present financial system to kill by suppression any new theory or system that may be advanced, then they have certainly gone to the other extreme in the case of Technocracy, which seems likely to be killed by premature and excessive publicity.

That would be a pity, because Technocracy has rendered an incalculable service by bringing home to an immeasurably large number of people the evils and defects of the present system.

This is the way I look at Technocracy.

It is but the setting forth of the problem itself. That is where it has succeeded in causing so much public hope. It has set down the problem from a new angle. The novelty of the new approach to the bitter problem of economic grief has created in the public mind a hope that the new method of presenting the problem is in some way its own answer.

Technocracy is nothing more than the name for a group of men who have banded together for certain study and research. So hasty and eager are the Americans to jump at conclusions that Technocracy has been accepted as meaning a definite doctrine.

Their practical proposals are very hard to find. Their leaders refuse to be interviewed, and so far as we can discover their plans involve a change so radical, so nebulous and so strange that they are unlikely to be

comprehended by the ordinary man. Briefly, they propose the scrapping of the price system and present currency altogether, the abolition of all debt and the substitution of a unit of energy which they allege is fixed, unchangeable and unchanging. This unit of energy is called the " Erg "—I presume the " g " is hard; if it is soft then we can say, " Under Technocracy we shall be able to secure all we want if only we have the urge."

I do not wish in any way to disparage either the Technocrats or the work they are doing. Any group of men who are able and qualified and who give their time to investigate the present haphazard economic situation which gives us poverty in the midst of plenty deserves praise and encouragement.

After all, is it not through such efforts that we shall eventually find the way out of depression into prosperity?

That we have everything that ought to make for prosperity, and that so far the blame for the depression is our own, is clear.

Upon this point all economists are fortunately agreed. May I quote one of them, Sir Arthur Salter, in his book " Recovery," who says :

" The responsibility is the greater, and the hope—indeed the assurance—of ultimate success is also the greater, because, difficult as it may be, the problem facing us is in its nature capable of human solution. If nature's resources were failing us ; if scientific invention and technical skill were inadequate to give us more than we have now, we might have no alternative but to economise and to endure. There have been periods in which impoverishment was due to scarcity, to the inadequacy of natural resources or of man's power to utilise them ; and the time may come in future centuries when the increased population of the world will press hard upon its available supplies, and when diminished standards and ultimate starvation will be an inescapable necessity for its surplus mouths.

" Happily, however, any such fate is distant, if not doubtful. We have no such hard limits to our progress. Never was Nature so prodigal in her gifts ; never was man so well equipped in skill and scientific resources to utilise them. Ours is a problem of the impoverishment that comes with plenty. It comes from defects in human organisation and direction, from imperfect planning, from weakness in our financial and distributive systems—from essentially remediable evils and essentially removable causes. It is incredible that such causes should permanently prevent the world from utilising and enjoying the resources at its disposal. Under the pressure of sufficient necessity man is an adaptable creature ; and he will in time, beyond question, find the solution."

Now one point I think ought to be made quite clear. Any new system proposed and any changes suggested in our existing system must be of such a nature that the changes shall be capable of a gradual transition from the old system to the new. If the system involves revolution in thought it must be evolutionary in practice. And, with the outline of a new economic system, there must be an outline of a plan by which the change can be made gradually, without upset and without hardships and to the benefit of the overwhelming majority of the population.

It is no use producing a plan which will give prosperity to our great grandchildren. We want prosperity in *our* time.

And this is where I fear I must quarrel with the proposals of Technocracy as far as I have been able to ascertain them. If we were starting a new country, it might or might not be wise to adopt as our unit of production, distribution and consumption something such as a unit of energy, but this world of ours is too wedded to currency or money and to a price system for any such revolutionary proposals to be within the range of practical politics.

But a system has been proposed and outlined in very great detail, which it is claimed could be easily adopted without upsetting the functioning of trade, business and the ordinary routine of the world, a system which would enable us to distribute and consume the production which science, invention and industry is so splendidly equipped to provide on a scale never before contemplated.

The system to which I refer is what has come to be known as the Douglas System of Social Credit, which has been proposed and explained by a fully qualified engineer, Major C. H. Douglas.

Before dealing with the practical proposals of Major Douglas it is necessary to refer very briefly to the evils and defects inherent in the existing system.

First of all we must agree that the present system has grown and that it was not planned. For the most part the system has constructed itself from the separate work of specialists, who built into the environment they found about them. Those who have made and worked this system have normally not understood it as a whole; those who have come nearest to understanding it—the academic economists—did not make it and do not direct it. That it worked fairly well in a certain environment and during a certain stage and rate of world progress may be admitted. But the environment, especially of industrial technique, has changed, and the rate of progress, or certainly the potential rate of progress, has enormously increased. As Sir Arthur Salter says, "Reason alone can now correct what instinct has created."

The function of money is to enable the people of a country to purchase the output of industry. It was established to replace the clumsy method of barter, to enable man to get the goods he wants and needs more easily than he could previously. It is important to note that the real and original function of money was not to finance production but to facilitate distribution and consumption.

Yet to-day money, or perhaps I should say bank-created money, is used almost exclusively to finance production. Loans to industry predominate largely as the source of the creation by the banks of new money.

Secondly, the volume of money in the community's pocket should be sufficient to purchase industry's output. But under the present system it never is. There is a chronic shortage of purchasing power in the pockets of the consumer.

In the United States over a ten-year period, 1909-1918 (I am quoting from the National Bureau of Economic Research), out of the $390,000,000,000 of gross value of the output of Industry, only $266,000,000,000 was distributed as wages, salaries and dividends. That is to say, the

rate of flow of money through the industrial process into consumption was constant throughout the ten-year period, namely, about 67 per cent of the flow of output values.

During this period industry was never able to get back *from consumers* the total costs of carrying on business, and was actually short by 33 per cent. The difference, of course, was made up from some source outside the industrial process, namely, from the credit extensions of the banks.

Thirdly, all new money should be created by the State and not by private institutions. Since it has been agreed that there must be sufficient money in the pockets of the consumer to purchase the products of industry, it follows that it must be the function of the Government's Financial Department, namely the Treasury, after having been advised by the Statistical Department, to create the required amount of money and not to allow anyone else to create it.

But, you say, surely if anyone else except the Government made money it would be forgery. Exactly ; but it might be licensed forgery accomplished by tacit consent.

And this is what happens. If anyone thinks that the deposits in the balance sheets of banks and the assets of business are represented by gold or silver, or even by notes, he will find himself sadly mistaken should he investigate. It looked early in the present year as if the American public were trying to make such an investigation, that is, to see if its assets could be turned into legal money—and we all know what happened.

It is estimated that the total amount of money in Great Britain in 1927 was round about £2,150,000,000, composed as follows :

Bank-created Credit Money	£1,675,000,000
Treasury Notes	300,000,000
Metal Coinage	60,000,000

This means that only 17 per cent. of the total money circulating ever existed as money, and, if we exclude notes, only 3 per cent. of our money consisted of tokens intrinsically valuable. Thus, 83 per cent. of our money consists of money absolutely created by banks (the reflection of bank investments, loans and discounts).

It will thus be seen that our present money system is like a top-heavy inverted triangle with a small gold base.

I do not want to say much about the gold standard, but since it will be seen that 3 per cent. of gold is used to provide 100 per cent. of money, the upset to the trade and industry of a country by the practical working of the gold standard, especially since the war, has made it, at any rate in its present form, unsuitable as a basis of currency.

If the volume of money is to be linked to the real wealth of a country —that is, production, distribution and consumption of the output of industry—it can hardly at the same time be linked to gold.

It was only by luck that during the nineteenth century new discoveries of gold happened to coincide with new expansions of industry. We cannot seriously expect to run the world or recover from depression

by the hope that something will happen or that the situation will right itself.

There may be a Divinity which shapes our ends, but we can hardly say that there is a Divinity which shapes our gold, though Heaven knows there is enough rough hewing involved in our attempts to find it.

After all, where is this gold we talk about so much but never see, disregarding the small quantity we put round our fingers or into our teeth ? It is either in the bowels of the earth, or in the bowels of a ship on the way to the bowels of a bank, or, if the ship sinks, it is in the bowels of the sea, and it is a great pity it is not all there.

Now, if we disregard money and consider only real wealth, then the profit and loss account of a nation will consist at the end of any given year of (1) income, which would be production plus appreciation, plus imports, and (2) expenditure, which would be consumption plus depreciation plus exports.

It is interesting to put exports in their right place, namely, as a loss or expenditure. A country does not need to export except to exchange for such goods as it is unable or unwilling to make or grow for itself.

Under our present system the money shortage, to which I have referred, between value of production and payment to consumers is made up by extension of banking credits, and, since these credits all go to production, there is a feverish effort on the part of every nation to export goods without any regard to whether imports are needed or not.

This leads to commercial rivalries and often to wars. Indeed, under our present system a big war is almost the only method of easing the congested situation and restoring an effective demand for goods.

This confusion of treating exports as an end in itself instead of as a means to an end is very important.

The same may be said of employment or unemployment. The improvement of machinery and ability to turn out goods and the invention of labour-saving devices necessarily involve unemployment. Labour-saving means unemployment-causing. If it does not, then what does it mean ?

Yet these things are national assets and are a wealthy inheritance in which we should all share.

Now for the proposals.

(1) The first step in economic reconstruction must be the restoration to the nation of control over the money supplies. This could be secured by the issue of treasury notes to supplant the present floating bank credit. In practice national money would be exchanged for interest-bearing national debt securities and would permit of a great reduction in taxation.

This would be done gradually, say 5 per cent. at a time over twenty distinct periods. As this money would flow into the banks, the banks would accumulate actual currency against loans instead of securities or faith as at present.

After the necessary currency issue had been completed, the banks would keep pound for pound or dollar for dollar in national money against their liabilities to depositors.

This would put the banks in a much stronger position than at present, and would prevent the devastating fall in prices which occurs at present when there is a tendency on the part of the people to cash in on their assets.

(2) The second proposal is that the nation should declare a dividend, consisting of the difference in its profit and loss account, just as a business does.

Supposing income—that is, production plus appreciation plus imports, were in proportion to expenditure (consumption plus depreciation plus exports) as 4 is to 3, then the nation would declare a dividend of 25 per cent.

This dividend would be distributed to consumers by charging them in the following year only three-quarters of the retail price for all ultimate commodities. In other words, the dividend would be distributed as a credit to the consumer. This is the crux of the Douglas proposals.

It is to be noted that this credit is only issued when the sale takes place ; therefore it cannot involve inflation. It is an annual expansion of currency actually earned by the nation, not only by the production, but by the consumption of goods.

This plan would also accomplish the ideal I mentioned as the basis for a satisfactory money system, namely, that consumers should be able to purchase the output of industry.

Prices being lower and money being more abundant, more orders would be given, and in this way the consumers would reap the benefit of each increase in national production.

There would be a steady percolation of new money throughout the whole community, resulting not in higher prices but in a higher standard of living. Gone would be the need to look abroad for markets ; a vast and ever-expanding market would be waiting at home.

There is nothing strange about this annual issue of new money. After all, is not this just what you would do if you were starting a money system for a new country ? You would commence by giving the inhabitants an amount of money roughly equivalent to the ascertainable value of production or output or real wealth possessed.

At the end of a year they would come along and say, " Look here, we have now increased our real wealth by work and output," and you would then give them additional money to correspond with the increase of real wealth.

And, furthermore, the special feature of the Douglas plan is that this new money would be spent and not hoarded, because it would only be issued at the moment when consumption took place, that is, when ultimate goods were sold.

There are other features, such as the distribution of part of the national dividend as a dividend for all, and the establishment of banks for each major industry, but my purpose is to introduce this plan to you in the hope that you will study it for yourselves.

Following are books dealing with the Douglas Plan :

Major C. H. Douglas : Economic Democracy ; Credit Power and Democracy ; The Control and Distribution of Production ; and Social Credit.

C. Marshall Hattersley : The Community's Credit ; and This Age of Plenty.

Maurice Colbourne : War or Unemployment.

The following books not dealing with the Douglas Plan may also be recommended :

Sir Arthur Salter : Recovery.

Professor Soddy : Wealth, Virtual Wealth and Debt.

SOCIAL CREDIT AND CHINA

BY

C. W. PENNETT

The introduction of anything new is always fraught with difficulties It matters not whether the new is a real advance or not, it is handicapped by the inate conservatism of the human mind, and, if one may so put it, by the general tendency to prefer the devil one knows to the devil one does not know. This fate has been met by the Social Credit System expounded by Major C. H. Douglas, while a more universal acceptance of his ideas has been further retarded because :

(1) Of all systems on the earth, the money system is imbued by most individuals with an air of sanctity and mystery. It is apparently regarded as something that is more uncontrollable than nature, for, whereas man is harnessing nature to his own ends, he allows the money system to defeat them. Therefore, as Major Douglas seeks to rectify the faults of the money system, and adjust it so that it works to the benefit of man, the average man is intolerant and suspicious of the new proposals.

(2) Also these proposals fall under the heading of the dread term "Economics," and, for some reason, a study of this subject is something that the average individual avoids like the plague. Possibly he has discovered that most economics is merely the art of hiding an incorrect conclusion in a wealth of words and ambiguity. Possibly the prosy utterances are in themselves sufficient to frighten him from the subject. Whatever be the reason, the fact remains that the individual who will criticise the work of engineers, artists, doctors, lawyers, scientists, musicians and authors will accept unstudied the pronouncements of orthodox economists as gospel, albeit each pronouncement is contradictory to the rest.

It is a fact that the analysis of the present system by Major C. H. Douglas has never been seriously challenged, even by economists of

repute. From this it is obvious that his proposals also remain unscathed after nearly fouteen years. Any new ideas in the economic field are generally avidly seized upon by economists and torn to shreds, and one must, therefore, come to the conclusion that the Douglas proposals and analysis are too exact to be challenged.

Such being the case, it is interesting to see whether they could not be applied to China, a country which is fortunate in the fact that, to a great extent, the business of exchange of goods is carried on with the aid of silver—silver remaining essentially a commodity—and unfortunate in that her possibilities of production are still extremely primitive. Because of these points, however, China is comparatively better off than Western countries. Abroad there is semi-starvation amidst plenty. In China, where starvation occurs, it is because of an act or acts of uncontrolled nature.

Before endeavouring roughly to outline a scheme for China it is necessary to mention one of the salient features of the Douglas proposals. Briefly, it is that the time has long since gone by when the amount of money in circulation should depend on the amount of gold or silver in a country. Douglas maintains that the money in circulation should depend on two things :

1. The goods on the market.
2. The potential production of the country,

and further, that the backing of the money should be the real wealth of the country. Also that the creation and destruction of money, whether token or credit, must essentially be a State prerogative.

With these points in mind we may observe that the first essential would be a stable Government, having no other ideas than to do its duty in governing the country to the best interests of the people. Such a Government may or may not be a long way off, but, given it, there is no reason why China should not put social credit into effect, although the immediate benefit would not be so noticeable as it would be in the case of a more industrialized country.

The first move would be to estimate as closely as possible the production and present consumption of the country—a big job, but not impossible. With these facts in the hands of the Government, the latter would realize the true position of the country for the first time. An assessment would also be made of the present value of all capital wealth—land, buildings, roads, railways, canals, industrial and mining plants, mines and the like. Having once got a fairly accurate estimate of this, all new plants or improvements would be credited to this account and all depreciation debited.

Having satisfied itself that the above estimates were as accurate, as far as humanly possible, the Government would allocate to the State Bank all rights of credit issuance and destruction. It would cancel all silver or gold backing to the State-issued notes, and would insist that all other banks should keep such State-issued notes, dollar for dollar, against deposits. It would not prohibit banks from lending money, but each loan would mean the bank's giving up the use of the money loaned to the

borrower, and not, as at present, an increase of money and deposits. A bank loan would decrease its deposits and repayment increase them.

Credit issuance and destruction would be governed entirely, by the State Bank, that is the Government. Having printed notes backed by the real wealth of the country, the Government would hand to each bank notes equivalent to its total deposits. It would also redeem gradually, by an issue of the same notes, all domestic loans, thereby releasing itself from comparatively heavy interest charges. It would also make it law for all such notes to be legal tender, and cancel all such privileges held by private bank notes, gold or silver. Payment in gold or silver would still be possible if acceptable to the seller, but it would be pure barter, both metals having been relegated to their proper standing—that of commodities.

The Government would accrue as much silver and gold as possible from inside the country and export it, or hold it for export, to the Western nations, who still seem to want these two very useless metals, thereby maintaining the country's international credit.

The Government would embark on a broad productive programme, issuing credit for production to industrialists, who would guarantee to produce the required goods. In return for such issuance the industrialists would limit, under heavy penalties, their profits per article produced, the profits varying with the type of industry. Much attention would be paid to quality, and the production of shoddy goods and raw materials discouraged.

Agriculture would be similarly treated. At the moment China is definitely agricultural, and it is possible that she is destined to remain so. It would, therefore, behove her Government to pay particular attention to this phase of industry with a view to raising a surplus, the quality of which would be acceptable for Western nations. This surplus of agricultural products could then be used to export to other countries in payment for necessary imports, notably machinery, such as railway materials and plant for mining, flour milling, cotton spinning and weaving, electrical and other purposes, which she is not in the position to produce at present. It is possible that for a time Western nations would accept gold and silver in payment for goods imported, but there is no doubt that they would eventually require payment in goods of real use, and these goods would almost inevitably have to be agricultural as far as China is concerned.

The export of solar energy in the form of coal or oil would be banned, and the Government would, as far as possible, see to it that all exports would be of agricultural products or manufactured articles.

With such a scheme taxation for the purposes of government would probably cease. Payments for governmental projects would be met by the creation of more paper money, and it is to be noted that this paper money would have a tangible backing—the increase in the real wealth of the State. At present a bank issues credit, which immediately has as much effect as token money, and such issuance reduces the comparatively minute gold or silver backing of money already in circulation.

Further, the salaries and wages of administrative services might conceivably be met by further credit issues, based more on potential than

repute. From this it is obvious that his proposals also remain unscathed after nearly fouteen years. Any new ideas in the economic field are generally avidly seized upon by economists and torn to shreds, and one must, therefore, come to the conclusion that the Douglas proposals and analysis are too exact to be challenged.

Such being the case, it is interesting to see whether they could not be applied to China, a country which is fortunate in the fact that, to a great extent, the business of exchange of goods is carried on with the aid of silver—silver remaining essentially a commodity—and unfortunate in that her possibilities of production are still extremely primitive. Because of these points, however, China is comparatively better off than Western countries. Abroad there is semi-starvation amidst plenty. In China, where starvation occurs, it is because of an act or acts of uncontrolled nature.

Before endeavouring roughly to outline a scheme for China it is necessary to mention one of the salient features of the Douglas proposals. Briefly, it is that the time has long since gone by when the amount of money in circulation should depend on the amount of gold or silver in a country. Douglas maintains that the money in circulation should depend on two things :

1. The goods on the market.
2. The potential production of the country,

and further, that the backing of the money should be the real wealth of the country. Also that the creation and destruction of money, whether token or credit, must essentially be a State prerogative.

With these points in mind we may observe that the first essential would be a stable Government, having no other ideas than to do its duty in governing the country to the best interests of the people. Such a Government may or may not be a long way off, but, given it, there is no reason why China should not put social credit into effect, although the immediate benefit would not be so noticeable as it would be in the case of a more industrialized country.

The first move would be to estimate as closely as possible the production and present consumption of the country—a big job, but not impossible. With these facts in the hands of the Government, the latter would realize the true position of the country for the first time. An assessment would also be made of the present value of all capital wealth—land, buildings, roads, railways, canals, industrial and mining plants, mines and the like. Having once got a fairly accurate estimate of this, all new plants or improvements would be credited to this account and all depreciation debited.

Having satisfied itself that the above estimates were as accurate, as far as humanly possible, the Government would allocate to the State Bank all rights of credit issuance and destruction. It would cancel all silver or gold backing to the State-issued notes, and would insist that all other banks should keep such State-issued notes, dollar for dollar, against deposits. It would not prohibit banks from lending money, but each loan would mean the bank's giving up the use of the money loaned to the

borrower, and not, as at present, an increase of money and deposits. A bank loan would decrease its deposits and repayment increase them.

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Further, the salaries and wages of administrative services might conceivably be met by further credit issues, based more on potential than

on actual production. The appearance of such additional money would not increase prices, as the inflation at present occurring in such circumstances would not take place owing to the limitation of the profit on each article. Indeed, it would have the further good effect of stimulating more production, desire becoming articulated demand. It must also be noted that in these circumstances currency would become stable, that prices could not increase without a slowing down of production, and every improvement of process would mean a price reduction to the consumers.

At the inception of such a scheme there would be no immediately apparent benefit to China, for, in spite of the Treaty Ports, the country lives largely by barter. But the stimulating of demand by the presence of more money in the pockets of consumers would tend to develope the country. As such development would be created by credit issuance, China would, without safeguards, soon be in the same unhappy plight as Western nations, whose credit created costs have become a large part of prices, with the result that no one nation can buy its own production. China would, therefore, keep a close account of production and consumption. Where production exceeded consumption over any given period the next period would see prices reduced to the percentage of the excess. The Government would make up the difference by an issue of credit. In other words, the excess production would become what it really is, a profit to the State for producing more than it consumes. The issue of credit, too, would render over-production impossible until the consuming body as a whole was satiated.

One other important factor would be looked to and that is the purchasing power of those released to leisure by reason of the improvement of process. Whether these people would be kept going by a "Dole" system, or the Government would keep them as shareholders in the State and pay them dividends, whatever method of putting purchasing power into their pockets might be adopted, is of no real moment.

What is vital is this : the State must recognize that, if improvement of process in production becomes so great as to bring about satiety with less than the labours of all, then obviously the individuals released to leisure must at least be made as well off as when it was required of them to produce.

If they were not so treated, and desired goods without the wherewithal to buy them, then this would obviously be a mal-adjustment of the social mechanism.

This short article is necessarily sketchy, but it is hoped that it will give some an inkling, or better, a realization, of the great truth of modern times. Real poverty is no longer possible unless artificially created. Methods of production improve daily. The spectre of want in its real self has been demolished. Unfortunately, its place has been taken by another spectre, a far more sinister one because it is the impersonation of the first and stalks with devastating effect amidst plenty. It is man-made, and, as such, can be far more easily destroyed than its predecessor, which was caused by unconquered nature. Yet man fought its predecessor for thousands of years and won a great victory. Having won, man has, for some inconceivable reason, created this other spectre, and,

instead of taking the rewards of his victory, has become amazingly subservient to the dictates of his own fetish. Mankind's whole policy to-day seems to be summed up in the saying, "There is water, but you must not drink ; there is food, but you must not eat ; there is clothing, but you must remain cold ; there is pleasure, but you must remain miserable." We are living in an era of "Thou shalt not," a doctrine so vicious in its effects that it is probably the most damnable that ever penetrated the minds of man. The sufferings caused by Bolshevism pale into insignificance before it. Is there any reason why China should sacrifice herself to it as other nations have done. ?

THE RUBBER GROWING INDUSTRY AND ITS FUTURE

BY

C. F. SHACKLETON, A.C.A.

Some thirty-eight rubber planting companies have been financed from Shanghai and have their headquarters in this city, the original capital involved being Tls. 17,000,000, a large proportion of it Chinese money. For this reason this industry is of considerable importance to China, aud so finds a place in our survey of this country's economic and financial position.

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The rubber growing industry, like all others connected with the production of raw agricultural materials, has suffered from the world-wide slump. During the past three years production has considerably exceeded consumption, with the result that the world's stocks of rubber are in excess of current needs.

Several factors render a correlation between requirements and production very difficult to maintain, as the yield from a rubber tree is not an annual harvest but one obtained daily throughout the year over a period of many years.

On an average six years or more must elapse between the time when the seed is planted and that when the tapping of the tree can be commenced, and, as it is impossible to foretell the demand for rubber so far ahead, it has happened that during a cycle of high prices due to shortage of supplies very large new areas have been planted. Until the year 1928 the consumption of rubber showed a steady increase, having risen from 270,600 tons in 1921 to 680,000 tons in 1928.* The following year there was actually an increase to 807,000 tons, whereas the production in 1921 was approximately

* All figures here quoted have been taken from statistics published by the Rubber Growers' Association

300,000 rising to 656,800 in 1928 and 861,400 in 1929. During the years 1923 to 1928 a scheme for the control of exports was in force in Malaya, and this accounts for the heavy increase in output during 1929, when the scheme was revoked. The slump which started in 1929 had a very serious effect on the demand for rubber, mainly on account of a reduction in the manufacture of motor-cars, and in 1930 it had fallen to 716,000 tons and in 1931 to 678,000 tons. The 1932 consumption showed a very small falling off, being 670,000 tons. But production did not fall to the same extent, being 820,000, 797,300 and 707,000 tons, respectively, for those years. The result of this is that world's stocks at the end of 1932 were reported to be 558,469 tons in Malaya, the United Kingdom and the United States of America, and consumers were enabled to obtain supplies at a price considerably less than the actual cost to the producer.

The difference between the cost of keeping up a tapped and an untapped area is comparatively small, and so the majority of estate owners find that there is a smaller loss by continuing to tap than would be incurred by stopping. Approximately one half the estimated planted area is native owned, either in small holdings, as in the Straits, or in large unsurveyed areas, as in Sumatra and Borneo. The former have very few overhead expenses and the latter none. The product from the latter areas is, however, a very crude material, and requires to be machined and cleansed before it is suitable for the market, while the amount paid to the actual producer is only a fraction of the price quoted for standard rubber. The result of this is that the production of native rubber in the Netherlands Indies has fallen from 106,000 tons in 1929 to 60,527 tons in 1932, whereas the small holders have only reduced their output from 204,000 tons to 174,000 tons. It is estimated that there is a potential yield of 300,000 tons from native plantings in the Netherlands Indies, but it is extremely doubtful if anything like this amount would ever be produced. The areas are comparatively sparsely populated, and, on account of casual upkeep and heavy tapping, a large portion of the yet untapped areas can be looked upon as a replacement of worn out areas.

As to the future of the rubber growing industry, this is a very difficult matter to assess. There is no doubt that the reduction in consumption has arisen to a very large extent by reason of the world's general conditions, and, with wider uses for rubber being found, there is no reason why the world should not consume in the course of a year or so the whole of the possible production. As planting has to a large extent been stopped for the past two or three years, and time, disease, storms and other agencies continue to take their usual toll of the trees on the plantation, the increase of production may be much slower than the demand. In recent years scientists have apparently perfected a method of propagating high yielding trees, but the areas thus far planted only represent a very small proportion of the whole.

It may be interesting to note that if consumption had remained as it was in 1929, the present world's stocks would only represent six months' supply, which cannot be called excessive, in view of the fact

that approximately three months must elapse between the actual tapping of the tree and the time the rubber is in the manufacturer's hands.

One point should be stressed and that is that most, if not all, estates have been on crisis measures for two or three years, with the result that nothing but the most essential work has been carried out. Salaries and wages have been reduced to a bare living scale, and, as such, do not attract new blood. The toll of the tropics has to be paid sooner or later, whilst, although minimum upkeep may not do permanent harm during a short crisis, it cannot be maintained for ever.

New uses for rubber, either in the form of latex or the more usual sheet and crêpe forms, are being continually found, but improved methods of tyre making and better roads have so far prevented any increase in demand. For instance, a few years ago a tyre survived 5,000 miles as against 20,000 miles or more at present. Nevertheless, it seems logical to anticipate that these improvements cannot progress in the same ratio, and the potential use of rubber is in my opinion quite as great as the potential output. The possibility of a substitute for rubber has not been lost sight of, but the question of cost is likely to render this of little danger for a long time to come on account of the huge quantities involved.

The estimates for consumption and production for the current year are dependent on many factors : an increase in the price will increase the latter, whilst improved world's conditions will increase the former, but an equal increase will have the result of reducing the ratio of stocks to requirements.

Another factor is the possibility that the two Governments most concerned may agree to place some restriction on exports. The trade returns of both show a sad falling off, whilst the low rate of wages now being paid has reduced the purchasing power of the natives to a quarter of what it was, with a resultant recoil on all other industries.

Rubber is one of the few commodities which is not controlled either directly or indirectly, and, although numerous schemes have been suggested, none so far has found favour with all concerned. Assuming that one is correct in anticipating that future potential consumption will be able to absorb future potential production, a temporary scheme to relieve the present sad plight of rubber growers should not be difficult to arrange. One suggestion is on the lines of an export duty in kind, the percentage of same being based on a quota assigned to each principal exporting country. The rubber thus coming into the hands of the Governments could either be used to build up a reserve against shortage or be destroyed. The advantage of this scheme would be that estates could continue in full production, thus helping unemployment, whereas a restriction of output would reduce the amount of labour required and would necessitate considerable arbitrary work to assess the standard production of each estate. Moreover such assessment would be impossible in dealing with the native areas of the Netherlands Indies. The suggestion to destroy rubber appears to antagonize many people, but I would suggest that it is only the equivalent of jettisoning part of the cargo of a steamer in order to save the remainder.

FERTILISER ECONOMY IN CHINA AND THE WORLD TO-DAY

The population of China in the reign of the Emperor Ch'ien Lung (1736-1795 A.D.) was found by census to be, in round numbers, 400,000,000. In 1932, according to statistics compiled by the Ministry of Interior, the population was nearly 475,000,000, an increase of less than nineteen per cent. during a period of two hundred years.

The population of Japan Proper, China's next door neighbour, has increased from 35,625,646 in 1874, according to the Japan Yearbook of 1917, to 64,450,005 in 1930, according to the Japan Yearbook of 1933, or nearly a hundred per cent. in sixty years.

The small increase in China's population can be attributed to many causes—warfare, floods, disease, famine and lack of sufficient food for an increased population. The three latter causes are interconnected, disease and famine being a natural result of food scarcity. The supply of food, animal and vegetable, depends upon crop production.

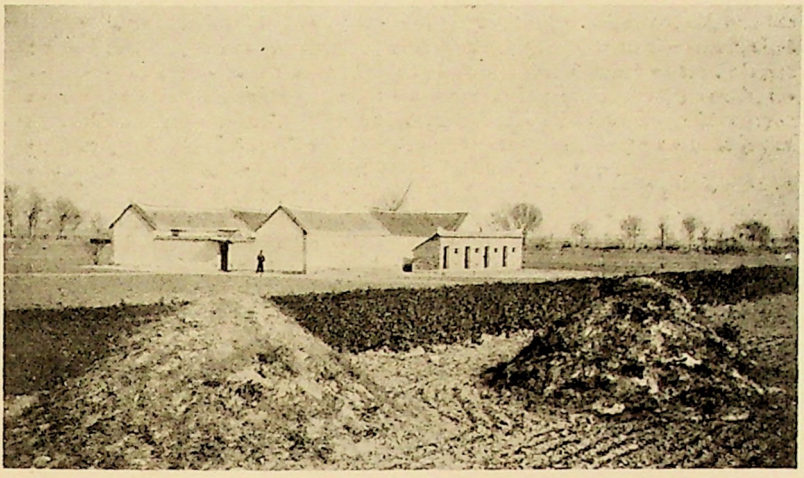
The Chinese farmers were for thousands of years the finest in the world, and, as a result of centuries of experiment and practice, they had brought about a condition of affairs in which everything which could be used as a fertiliser was utilized, every human and vegetable waste product. Ponds, rivers, lakes and creeks were scoured for their ooze and mud, the hillsides were in many cases stripped bare of grass and the ashes of plant material were used. Even full advantage was taken of the beneficial effects of lime and gypsum in certain soils. The fact that legumes store up a material which helps the growth of crops has been known to the Chinese peasant for many centuries, and green manuring with these crops was largely practised.

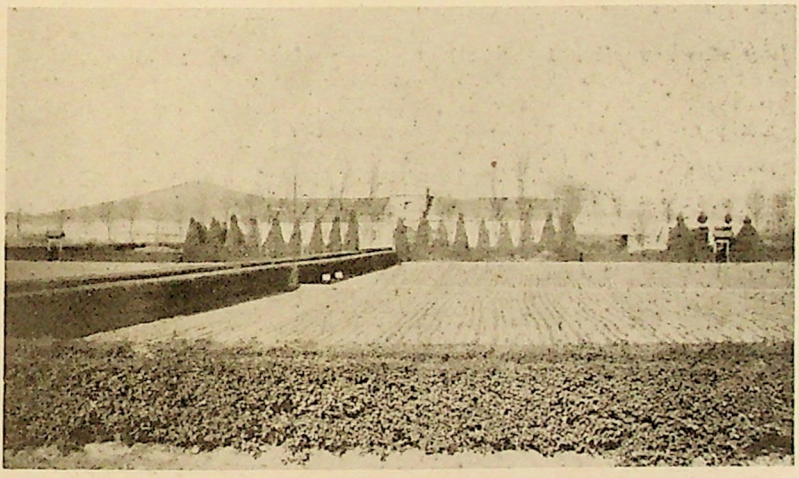
However, in spite of all efforts to conserve and increase the supply of natural fertilisers, a limit was reached more than a century ago, no increased output of crops being possible. The result was that the increase in population came to a halt, or at least slowed down very considerably.

As a matter of fact, China at the present day has to supplement her production by the annual importation of large quantities of cotton, rice, wheat and wheat flour. The combined value of these materials imported was, according to the Chinese Maritime Customs Returns, Hk. Tls. 296,000,000 in 1930, and Hk. Tls. 360,000,000 in 1931. At the same time, China's production and export of silk and tea have been rapidly declining during recent years, causing an increasingly unfavourable trade balance.

What are the remedies for the above state of affairs ? Three immediately suggest themselves :

1. Improvement in yields by breeding better crops.
2. The use of insecticides and fungicides.
3. The increased use of fertilisers.





Two Views of the Hsu-chou Fu Wheat Experimental Station, where the effects of the Products of the Imperial Chemical Industries, Ltd. are tried out. The China Branch of this great Organization has many Experimental Stations.



A Chinese Farm Woman taking Weed and Mud from the Bottom of a Creek to use for Fertilizer for the Mulberry Trees seen in the Background.



A Chinese Phosphate Mine which has been completely worked out. The Cut is over a Thousand Meters in Length and down to Water-level. Hundreds of Thousands of tons of Material must have been removed from it.



A Chinese Farmer turning over the heavy Soil of Ricefields in Preparation for the Planting of a new Crop.



Cutting the Rice Crop in the late Autumn. On most Chinese Farms only the most Primitive Implements are used.

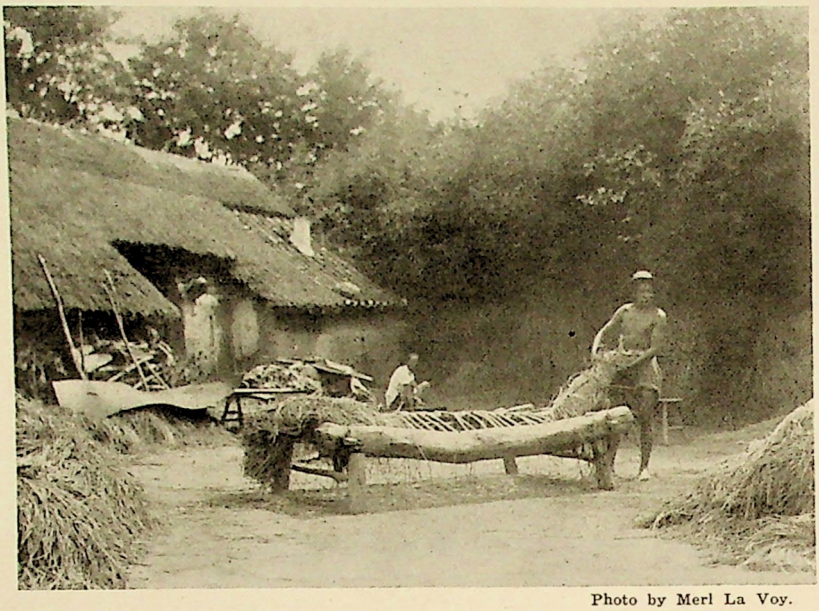


Photo by Merl La Voy.

A strange Contrivance for separating the Rice Grain from the Straw on a Yangtze Delta Farmstead.



Sifting and Winnowing the Rice Grain on a Yangtze Delta Farmstead.

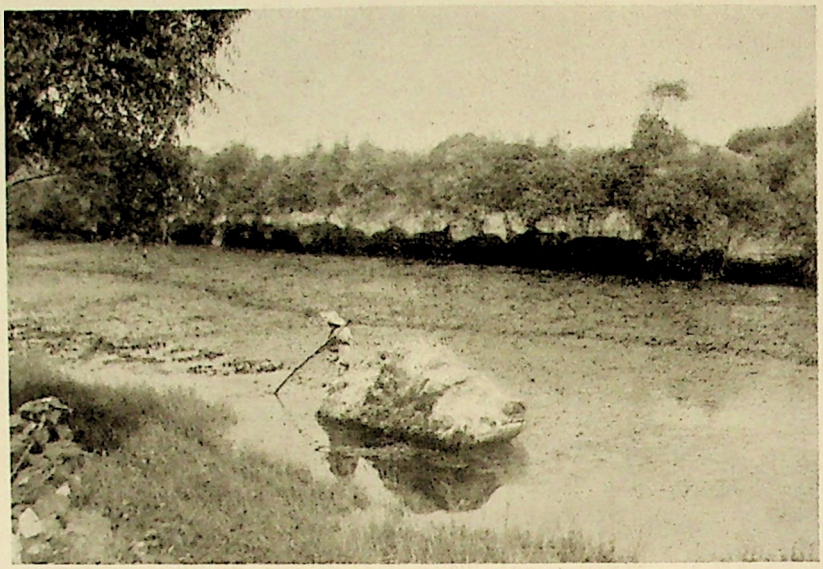


A Yangtze Delta Farmstead with the Year's Rice Crops stacked ready for Threshing.

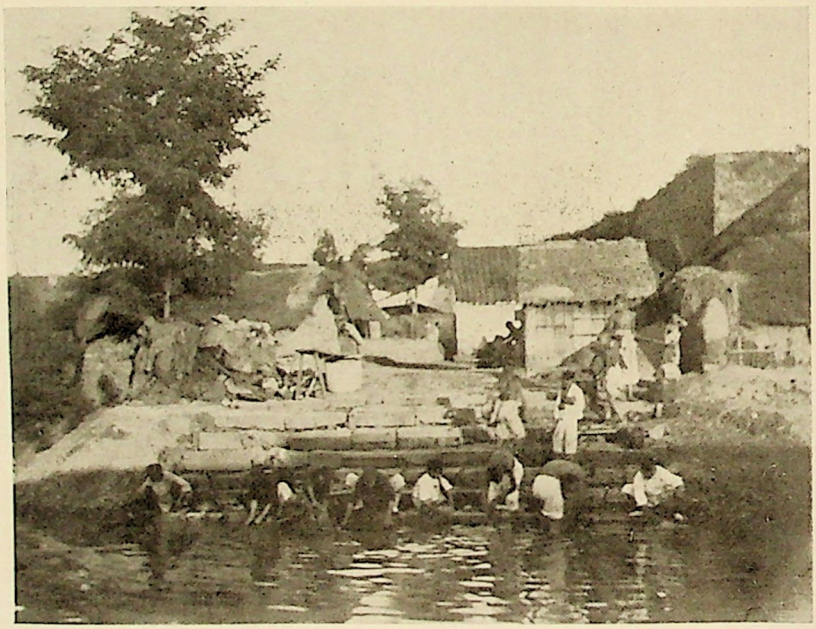


Photos by Merl La Voy.

Drying out Rice Straw before Stacking on a Yangtze Delta Farmstead.



Carrying Home by Boat the Garnered Rice Crop in the Yangtze Delta Region of Mid-China.



Photos by Merl La Voy.

Washing Day in a Village on the Banks of one of the innumerable Creeks of the Great Yangtze Delta Region.



Photo by Merl La Voy.

Farmers offering their Wares at a local Village Fair in Rural Kiangsu.

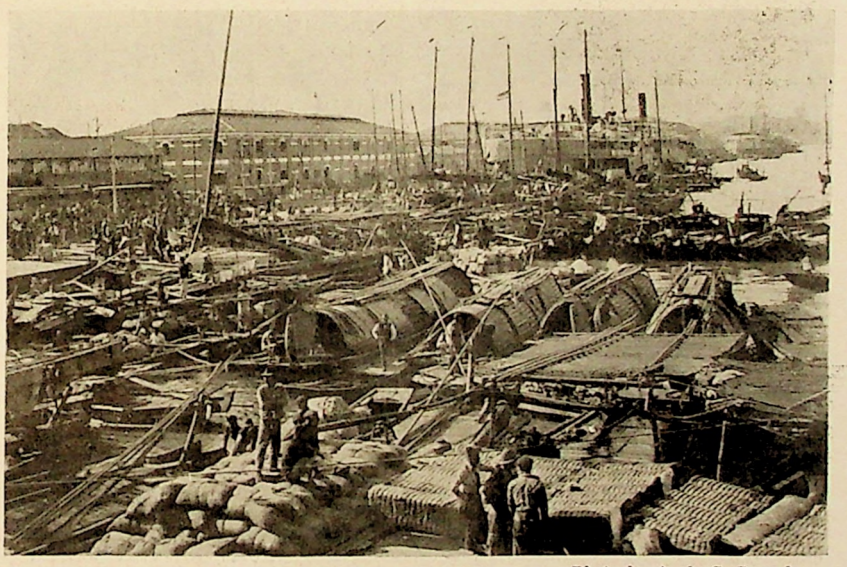


Photo by A. de C. Sowerby.

Native Shipping on the Whangpoo River off Nantao, the Chinese City of Shanghai.





Two Views of young Pine Trees on the Estates of the New Zealand Perpetual Forests Limited, where such Trees grow at several Times the Rate they do in other Countries.

The last of these is the most important and this article will be confined to its discussion.

A similar problem confronted Western countries until about a hundred years ago. No fertiliser was available except natural manure. With the rapidly increasing population of these countries the need for grain, vegetable and other food crops steadily increased. As in the case of China, the supply of natural fertilisers was not sufficient to ensure the necessary harvest, and there arose a demand for the three principal food elements, nitrogen, phosphoric acid and potash. Nitrogenous fertilisers, by far the most important, did not exist in large enough quantities to enable sufficiently rich harvests to be obtained. It must, in these circumstances, be considered a lucky coincidence that the chemical industries in the first ten years of the twentieth century succeeded in obtaining nitrogen directly from the air, in which it is present in great quantities, by converting the nitrogen to ammonia and fixing it in the form of a cheap pure harmless white salt, sulphate of ammonia. In this form the nitrogen taken from the atmosphere may be stored indefinitely, transported at will and placed wherever required at the service of the farmer.

Prior to the establishment of the atmospheric nitrogen industry sulphate of ammonia had been obtained as a by-product of the coal gas and coking industries, but the quantities thus obtained were inadequate to the world's need for nitrogenous fertilisers. By the discovery of a method of calling on the enormous reserves of nitrogen in the atmosphere a plentiful supply of the principal plant food is now assured for all time.

Many countries, Italy, for instance, which had to import a large proportion of agricultural products, especially wheat, can now do away with the necessity for importing, through obtaining, with the use of sulphate of ammonia, a higher yield of their own. Other countries can produce in excess of their own needs, and have become exporting countries. Holland, for instance, the country which uses the greatest quantity of sulphate of ammonia per unit of area, exports great quantities of vegetables to nearly all the countries of Europe. These vegetables, manured with sulphate of ammonia, are everywhere prized on account of their excellent quality.

In tropical countries sulphate of ammonia has been used for a long time in large quantities. For instance, Java is compelled every year to use 2,016,000 piculs* of sulphate of ammonia for her sugar cane. The average dressing of sulphate of ammonia for sugar cane is 50 catties per *mow*† Even this very heavy dressing has not the slightest harmful effect on the soil. On the contrary, Java is the country where the world's largest yield of sugar per *mow* is obtained.

In Japan Proper with an area of only 20,000 square miles of land which can be put under crops, we have a different state of affairs from that which has taken place in China. Here the farmer takes advantage

* 100 catties = 130 lbs.

† One *mow* = $\frac{1}{6}$ acre.

of the most up-to-date research which the Government puts at his disposal in connection with soils, crops and fertilisers, with the result that the crop production has increased sufficiently to enable the population of Japan to double itself in sixty years. One of the principal causes of this increase in crop production is the liberal use of artificial fertilisers.

The consumption of sulphate of ammonia in Japan has been increasing continuously from year to year. In 1913 it was 122,988 tons, in 1930-1 it was 630,000 tons.

Calculated on the basis of the whole arable land of Japan 15.5 kg. of nitrogen per *ha.* is applied in the form of sulphate of ammonia, which is approximately 1.7 catties of nitrogen per *mow*, and this amount of nitrogen in the form of sulphate of ammonia is given in addition to 16 kg. nitrogen per *ha.*, or 1.78 catties of nitrogen per *mow*, applied in the form of organic fertilisers consisting mainly of bean cake and fish meal. On top of all this 47.79 kg. of nitrogen per *ha.* is applied, mostly in the form of compost, farm manure and night-soil. This gives the large total dressing of 79.29 kg. of nitrogen per *ha.* equal to 8.8 catties of nitrogen per *mow.*

The Chinese farmer is beginning to know that sulphate of ammonia is an important material for him, since by its use he can get higher yields from his land, and so improve his welfare. Up to ten years ago very insignificant quantities of sulphate of ammonia were used in China, whereas to-day 2,520,000 piculs are used every year, and in all the coast provinces, from Kwangtung in the south to Hopei in the north, the farmers of the Chinese Republic have already become acquainted with sulphate of ammonia.

Those who have travelled largely throughout the more important agricultural districts of Middle China, such as Northern Chekiang, Southern Kiangsu, Kiangsi, Hupeh and Hunan, will be struck by the large amount of land which is left fallow during the winter. In the majority of cases winter crops, such as wheat, barley and rape, could be grown ; however, on account of the scarcity of fertilisers, especially those containing nitrogen, this could not be done without rapidly impoverishing the soil.

It is clear from the foregoing that if China wishes again to move forward with the march of progress, feed her present population adequately, and make allowances for future increase in population, she must adopt up-to-date agricultural practice, including the general use of artificial fertilisers.

The ensuing increased production of rice, cotton and wheat would ensure a saving of hundreds of millions of dollars, which could be kept in the country to enable other much needed schemes of development such as road and railway construction and river conservancy to be carried out.

During the last few years considerable effort has been made to improve agricultural conditions in China. Experimental stations have been introduced and are being added to. The Central and Provincial Governments have realized the necessity of research and extension work in connection with agriculture. Professor H. H. Love, Agricultural

Adviser to the Ministry of Industries of the Chinese Republic, also Director of Crop Improvement of Kiangsu and Chekiang Provinces, has put forward a national programme for the development of agriculture in China in the *Journal of the Agricultural Association of China*, No. 108, January, 1933, which, if adopted, should have the most far-reaching effects on the livelihood of the Chinese people.

Professor Love concludes his programme as follows:

> "This leads me to say that unless some such program as I am suggesting can be put into effect, free from political influences and changes, China can never have her agriculture developed in the way it should be; and China without such a thorough-going program will continue to be, at least in certain parts of the Republic, on the verge of starvation for centuries to come.
>
> "There is no better way of fighting communism and banditry and of binding all parts of China together than to give attention to the development of China's greatest industry, agriculture."

MASS BLASTING ON THE UPPER YANGTZE

BY

H. R. DIXON, M.C., B.SC.

(Consulting Engineer to the K'ung Ling T'an Improvement Commission)

The following astonishingly modest account of an engineering undertaking that is worthy of the best traditions of the profession will appeal to all who are interested in engineering enterprise in China. We claim to have a small share in it, for last autumn Mr. Dixon, who had conceived the idea of getting rid of the two offending rocks in the always dangerous K'ung Ling T'an Rapids in the Yangtze Gorges above Ichang by blowing them bodily out of the water, came to us for information regarding the geological formation at this point in the river, this being an important matter, since it was feared that, if the material of the adjacent precipitous cliffs was of a crumbling or friable nature, the terrific explosion required to blast away the two rocks in the river might bring the cliffs themselves down as well, and so produce an even more serious condition in the river than that which already existed. We were able to place Mr. Dixon on the right track to secure the necessary information, which he did through Dr. J. S. Lee, Director of the National Research Institute of Geology of the Academia Sinica at Nanking.

Mr. Dixon says nothing of the dangers to which those who carried out the undertaking were exposed, but these will be appreciated when it is realized that the two rocks disposed of lie in the middle of a swirling rapid, making any boat work extremely hazardous, and also that thousands of pounds of high

explosive had to be handled by the party. The mishandling of a single stick of dynamite would have meant the death of every member.

It will be of interest to many of our readers to know that the River Inspector mentioned in the narrative is none other than R. G. Everest, one of the heroes of the Zeebrugge raid and the Jutland naval engagement during the World War.—EDITOR.

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Travellers on the Upper Yangtze well know the special dangers of the K'ung Ling T'an Rapid at low level. There are a North and a South Channel at this point in the Great River, and squarely in the middle of the South Channel two large rocks protruded above the low level surface, making this channel utterly impossible for navigation except during high water season. During the low water season all shipping on the Upper Yangtze had to take the North Channel, and the majority of accidents and wrecks occurred at this point. Some two years ago leading merchants and shipping interests in Chungking and Whanhsien formed a special Commission for the improvement of the channel at this point, which lies some thirty-three miles west of Ichang, below the Nin Kan Ma Fei Gorge.

The collection of funds and the direction of all technical work was placed in the hands of the Chinese Maritime Customs. Preliminary work was carried out in the winter of 1931-2, and, although a high river level prevented very much from being done, this enabled the River Inspector to make a thorough study of the possibilities, which formed the basis of the successful operations carried out during the past winter and spring.

After a further thorough investigation had been carried out in December last, it was decided to attempt to create an entirely new channel for shipping by removing the two large rocks in the hitherto very dangerous and quite un-navigable passage to the south of the great rock called Ta Chu, which divides the river at this point.

The extremely thorough organization of the River Inspector and his staff enabled the objective to be achieved, for, whereas it had at first been expected that only one of the two rocks could be attacked during a single low water season, not only was that one destroyed completely, but the greater part of the second rock was also removed. By some freak of nature a small portion of the second rock remained below water, but it is, nevertheless, now possible for ships to avoid the tortuous and highly dangerous North Channel.

The new South Channel has a minimum width of 200 feet, in which there is nowhere less than 18 feet of water at local zero level, while the boils and running whirlpools which made it impassable before, not to mention those at the eastern entrance of the North Channel, have almost entirely disappeared.

The method suggested to the Customs Authorities and subsequently approved by them for the removal of the rocks was that of mass blasting, and on March 22 the large charges, previously placed in chambers at the bottom of short shafts made in the rocks, were fired simultaneously.

Sixteen thousand two hundred pounds of high explosive were used for this purpose, and in the resulting explosion some ten thousand tons of rock was scattered completely, some of it to a distance of twelve hundred yards.

Throughout the whole of the operations not a single man came to any harm, either from accident or serious sickness. The safety of all the local inhabitants was ensured by their removal to a distance of nearly two miles on the day of the blast. Neither was any damage caused to the cliffs in the gorge above. A few houses were hit by flying stones, but all claims were promptly dealt with to the owners' satisfaction.

The work called for unusual methods in many respects. The construction of sampan bridge approaches to the rocks in the swirling seven knot current, the erection of reinforced concrete "ships" on the rocks to protect the mine shafts from being flooded out by a rise in river level, and the shaft sinking and tunnelling work itself, carried out with very reliable Ingersoll-Rand pneumatic plant, all presented special difficulties, and it was only by unceasing efforts during every minute of daylight that the work was accomplished before the river rose.

The party lived in huts, erected on Ta Chu, during the whole winter, and perhaps the secret of the success achieved lay in the spirit of enthusiastic and happy cooperation which inspired every member throughout.

On March 28 the Customs ship "*Hsia Kuang*" passed through the new channel three times under the command of the River Inspector, and the first new channel ever made for ships on the Upper River was thereupon declared open.

ENGINEERING, INDUSTRIAL AND COMMERCIAL NOTES

ENGINEERING

The New Pearl River Bridge at Canton : In the accompanying illustrations, kindly lent us by *La Revue Nationale Chinoise*, the new steel bridge over the Pearl River at Canton that has recently been completed is shown. This is a notable achievement, and one which shows that China is going ahead in the way of engineering enterprises. The contract for this bridge was secured by Messrs. Andersen, Meyer & Co., Ltd., the bridge being built by MacDonald and Gorman, American engineers, while the materials throughout were supplied by the U.S. Steel Products Company. We understand that two more bridges across the Pearl River have been contracted for.

Blasting Away Obstacles on the Upper Yangtze : Elsewhere we give an account by Mr. H. R. Dixon, Consulting Engineer of Shanghai, of the recent successful blasting away of two rocks that made a formidable obstacle

in the South Channel of the K'ung Ling T'an Rapid above Ichang in the Upper Yangtze. Mr. Dixon himself conceived and carried out this dangerous and ticklish operation, the success of which has rendered the South Channel navigable to steamers during periods of low water, when previously only the North Channel was available for traffic on the river at such times.

Transport and Industry Conference: An important conference of experts was held at the Railway and Engineering Exhibition of Chiao Tung University in Shanghai early in April on the subject of transport and industry. The importance to China's industries of adequate and rapid means of transport were emphasized by various speakers, Mr. K. Cantlie, one of the foreign advisers to the Ministry of Railways, discussed various means of transport and their bearing upon industry. Mr. R. S. Norman offered recommendations for the general development of China's economic and industrial status. Miss Viola Smith, United States trade commissioner, stressed the need for good roads. Mr. John L. Baker also spoke on China's development; while Mr. A. J. Hughes discussed the possibilities of finance and insurance. The meeting was presided over by Dr. J. Usang Ly, president of Chiao Tung University.

SHIPPING

China's Shipping: At present by far the greater part of shipping that visits the larger ports of China is under the flags of foreign countries, whose mercantile fleets carry trade and passengers to and from this country. There are several large foreign companies engaged in the coastwise and Yangtze traffic. In the latter, however, Chinese shipping now exceeds foreign, and it is only a matter of time for the one to replace the other altogether. Chinese shipping companies are also beginning to extend their operations to the overseas trade.

The Nanking Ferry: On April 17 the newly constructed train ferry, which is destined to ply between Nanking and Pukow on the Yangtze, dropped anchor in the Whangpoo River at Shanghai after a sixty-day journey from Newcastle-on-Tyne, where she was launched some months ago. This vessel has been named the *Changkiang*, and, on arrival in this port was immediately boarded and inspected by Mr. Chen Hwa and Mr. K. Cantlie, officials of the Ministry of Railways, accompanied by Mr. A Malcolm of Malcolm and Co., Ltd., the local representatives of Messrs. Swan, Hunter and Swigham Richardson, Ltd., the builders. The *Changkiang* was brought to China under her own steam by Captain J. Simm, shown in the accompanying photograph with the other gentlemen mentioned above. Some 372 feet in length the train ferry has three sets of tracks, each of which is 300 feet long and can accommodate seven cars, while a 65 ton locomotive can be accommodated on a transversing gear aft. This fine vessel has a gross and net tonnage of 2,862 and 1,347, respectively, is 58.6 feet in width, is furnished with twin-screw triple expansion engines of the latest type and two boilers of the Howden forced draft type, and has a speed of 12¼ knots an hour.

When the wharves and bridges at Nanking and Pukow are ready and the ferry has been put into service, several hours will be saved in the railway journey between Shanghai and Peking, and passengers will be able to go straight through without changing cars.

The China-Java Traffic: The relations between China and the Netherlands East Indies are numerous as well as important, and will no doubt increase when the conditions of the world in general and of the Far East in particular improve.

The products of the Netherlands Indies, of which sugar may be specially mentioned as being really used in China, as well as the millions of Chinese immigrants who live throughout the whole Malayan Archipelago, create a lively cargo and passengor traffic between the two territories. The Java-China-Japan Lijn has an important share in this transportation. From a single service between Hongkong and Java thirty years ago this line developed notwithstanding great difficulties, with

which every inhabitant of the Far East is only too familiar, to an enterprise connecting the Netherlands Indian Isles with the whole of the Chinese and Japanese coasts. In the last few years the transportation of European passengers has increased considerably. Numerous Europeans, in going to their own countries, take the opportunity of visiting Netherlands India and the Java-China-Japan Lijn, the Rotterdam Lloyd Line and the Netherland Royal Mail Line joint service enables passengers to travel for a relatively small amount by way of Bali and Java to Europe. Also the number of tourists visiting Netherlands India for a vacation trip is steadily increasing. Bali, the most beautiful island of the world, has in a few years become a centre of tourism in the Far East. Java-China-Japan Lijn now consists of thirteen ships, of which the *Tjisadane*, the *Tjinegara* and the *Tjibadak* are specially equipped for tourist accommodation.

AVIATION

Aviation in China : In a country such as China, where the distances are enormous and railways and motor roads still far short of the requirements, the possibilities of aviation present themselves in a more than usually attractive form to those concerned with rapid transit. As a matter of fact, those in authority have not been slow to take advantage of this easy and rapid method of getting about the country, and each of the highest executives owns his private aëroplane. By this means they have been able to hold important conferences at far distant points in rapid succession, and it is not too much to suppose that it is in no small degree due to the aëroplane thus used that the present Government has been able to maintain its authority throughout the country to the extent it has done during the six years of its existence. This, perhaps, is the most important rôle of aviation in China to-day. The next most important use for the aëroplane is the carrying of passengers and mails and considerable effort has been directed toward this end during the past few years. It is now possible to fly from Shanghai to Nanking, to Hankow, to Peking, to Chunking, or even to Lan-chou Fu in far distant Kansu, in the latter case doing in a few days what by railway and road used to take many weeks, and also avoiding the dangers of road travel, especially that of attack by lawless bands of one sort or another. Mails may also be sent by air to these places, thereby saving a great deal of time.

Recently the Chinese have developed an ardent desire for a powerful military air force, and large sums have been subscribed by the people for this purpose. The indignities suffered by the nation at the hands of their neighbours have fostered this idea, and it is generally felt that the only way to overcome aggression from the outside is to have an efficient air force strong enough to repel all attacks. Thus the purchase of fighting, scouting and bombing 'planes has been going on apace, while aërodromes have been established in all parts of the country and aviation schools and academies inaugurated.

The China National Aviation Corporation, in which the Ministry of Communications of the National Government owns a 55 per cent. interest, while the other 45 per cent. interest, formerly owned by the Intercontinent Aviation Company, was acquired on April 1 by the Pan American Airways, is a strictly commercial concern, and is reputed not to be interested in military machines. It is this institution that maintains the aëroplane services from Shanghai to Chungking and to Peking, and, it hopes soon, to Canton.

With the entrance of this company into the Far Eastern field of aviation the possibilities of Trans-Pacific air services become more tangible.

The United Aircraft Exports Inc. is established in China with the object of selling both military and commercial air-craft. They have services in America operating from San Francisco to New York and from Seattle to New York.

The Intercontinent Aviation Company acts as sales agent for the Curtis, Wright and Douglas aëroplanes.

It is probable that in no branch of transport is there such a bright future in China as in aviation.

We understand that British aviation interests are also coming strongly into the China field.

ROADS

The Importance of Motor Roads in China : Side by side with the building of railways in China must come the making of good motor roads branching off into the neighbouring territories and acting as feeders to the railways. In the last few years enormous strides have been made in the building of motor roads all over the country, with a resultant great increase in the importation and use of motor vehicles.

The establishing of 'bus services wherever roads have been made is an interesting economic feature in the country's transportation. We hear of such services being developed all over the country, often in places that might have been looked upon as altogether too distant from the big centres to warrant such development. Recently a good motor road has been completed from Shanghai to Hangchow, where it meets another from Nanking to Hangchow. This has given a wonderful outlet for Shanghai motorists, and it presages the day when touring by motor-car will become one of the regular features of travel in this country.

It is possible to-day to travel by motor-car all the way from the railway terminus at T'ung-kuan on the Honan-Shensi border to Lan-chou Fu the capital of Kansu, and recently we have heard of motor excursions into the Kokonor region and beyond.

It must be borne in mind that there are plenty of ordinary roads throughout the country, and the construction of motor roads usually entails nothing more than surfacing a part of these for motor vehicular traffic. This applies to the east, centre and north. In the south where heretofore no animal or cart traffic has been in vogue, there are few roads in the real sense, but mainly footpaths which wind up and down the valleys and over the hills and mountains with little regard to gradients. Thus the building of motor roads in the south is a far more serious, difficult and costly undertaking than in the north. This, however, is to a certain extent offset economically by the innumerable waterways that occur, providing a cheap and efficient means of transport.

RAILWAYS

China's Railways : It is a matter of considerable economic importance that this great country should be well supplied with railways, for without them it would be practically impossible to move the vast quantities of commodities of one sort and another that the country produces. In China Proper there are now a number of really important and extensive railway lines, more or less linked up so as to form a wide-meshed network over the country. It is impossible here to give details of these, but it may be stated that at least the eastern provinces are now well supplied with railway communications, while in the southern and western provinces railways are projected that will ultimately extend the network to the Tibetan and Burmese borders and on into Central Asia. Manchuria is, perhaps, better supplied with railways to-day than China Proper, but this is due to peculiar conditions which developed a railway-building competition between the Chinese and the Japanese. The result, of course, can only be looked upon as of the greatest benefit to the country. The same benefit will accrue to China Proper, when the great provinces of the west, Kansu, Sinkiang, Szechuan and Kwei-chow, have been traversed by extensions of already existing railways. It will be a great thing for Szechuan when the projected railway up the Yangtze Valley is completed, and an even greater thing for Kansu when the railway which now stops at the eastern border of Shensi Province has been carried through to Lan-chou.

From Canton to Calais : The dream of being able to travel all the way from Canton to Calais or any other port in Western Europe by railway will come true when the last section of the Canton-Hankow Railway, now under construction with British returned Boxer Indemnity money, has been completed. This will be the longest connected railway journey in the world, and it will be possible to complete it in something under three weeks, provided proper schedules are maintained. It is hoped that the end of the present year will see this a *fait accompli*.

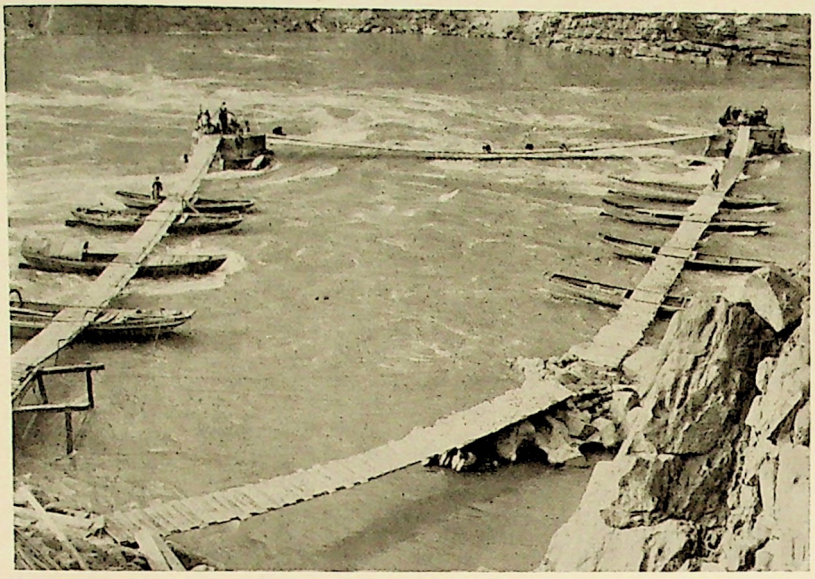


The Explosion at the K'ung Ling T'an Rapid, when 16,200 lbs. of High Explosive was touched off at 11.30 on the Morning of March 22, blowing away some 10,000 tons of Rock, some of it to a Distance of 1,200 Yards, and leaving the South Channel clear for Navigation.

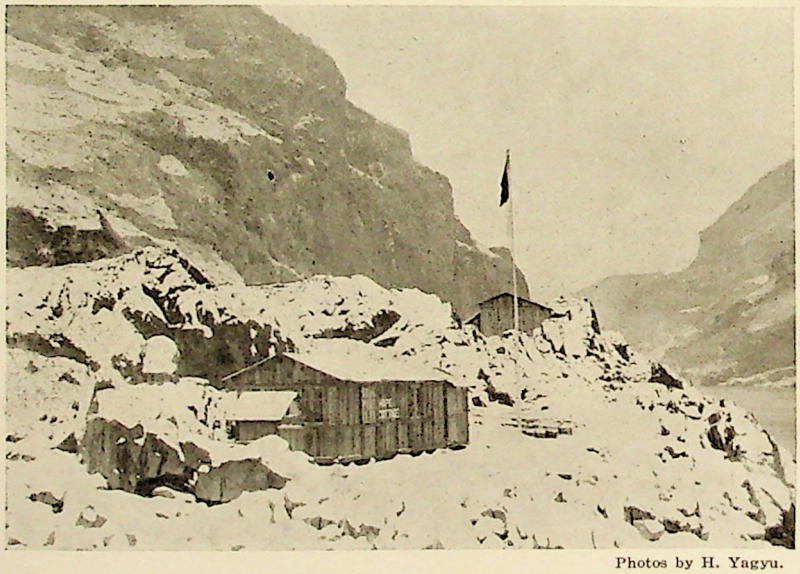


Photos by H. Yagyu.

The two Rocks in the South Channel of K'ung Ling T'an Rapid that made Navigation impossible during Low Water. This Picture was taken just before the Explosion shown above took place.

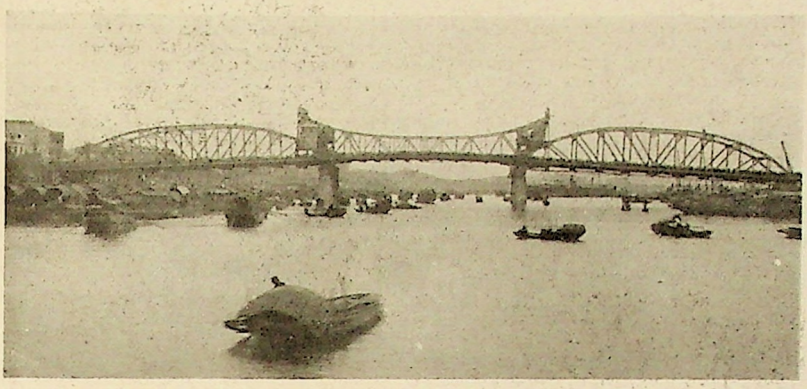


How the two Rocks at the K'ung Ling T'an Rapid were reached. Note the Swirl and Force of the Water which rendered Operations both Difficult and Hazardous.

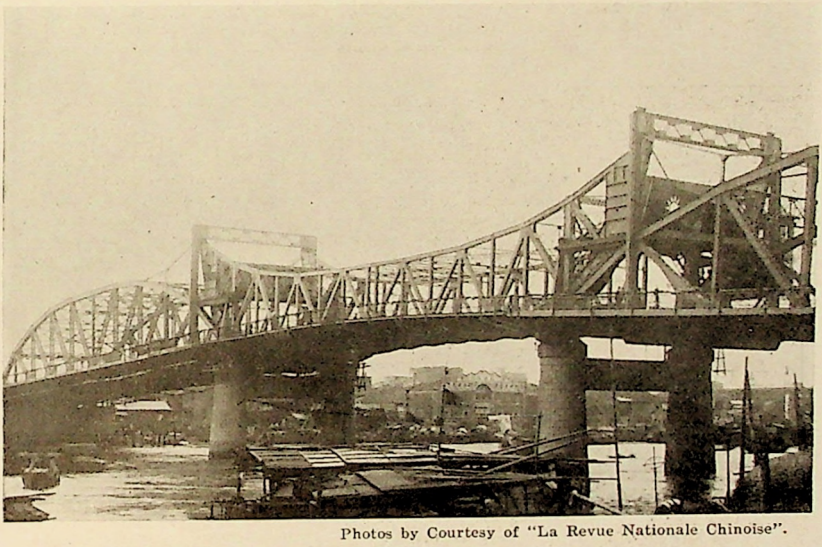


Photos by H. Yagyu.

"Hope Cottage," the Home of the K'ung Ling T'an Party during the Months they were engaged on the Work of Tunnelling in the Rocks shown above.

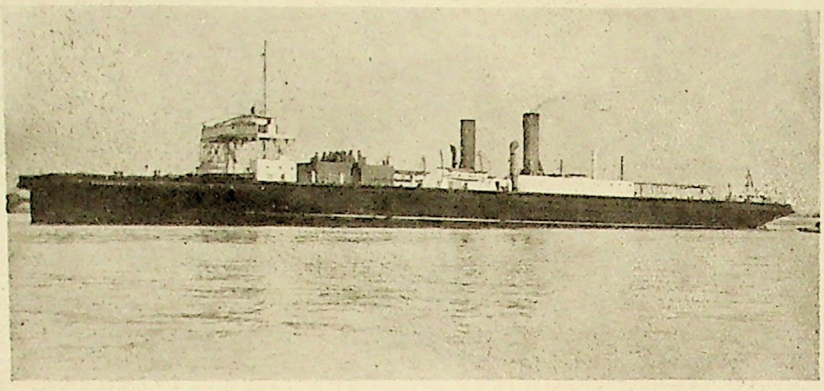


The recently completed Steel Bridge across the Pearl River at Canton, contracted for by Andersen, Meyer and Company, and built by MacDonald and Gorman, American Engineers.



Photos by Courtesy of "La Revue Nationale Chinoise".

A close View of the New Steel Bridge spanning the Pearl River at Canton showing Details of Construction.

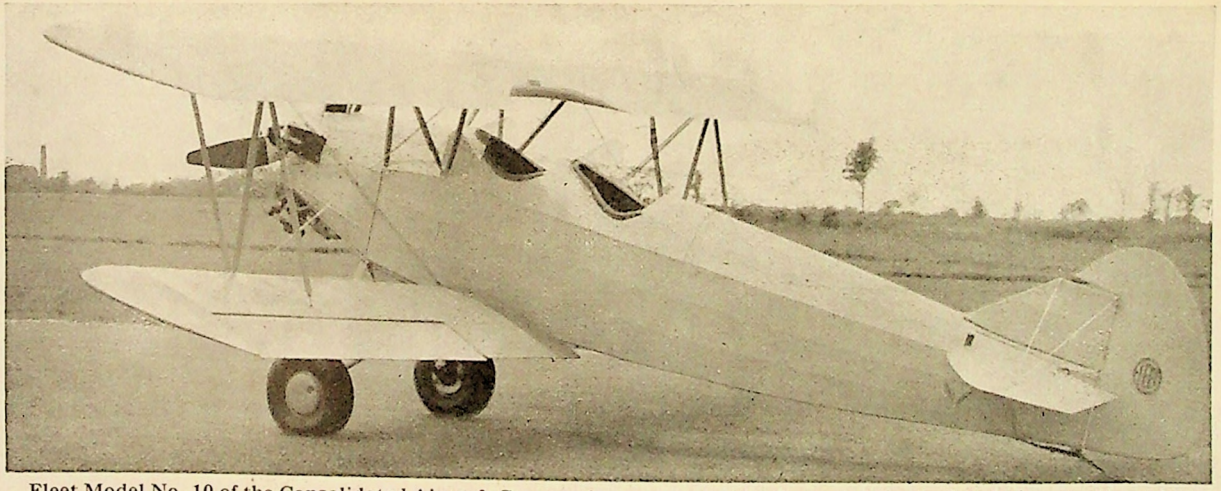


The "*Changkiang*," the Nanking-Pukow Train Ferry, which recently arrived in Shanghai, having come all the Way from Newcastle-on-Tyne under its own Steam.

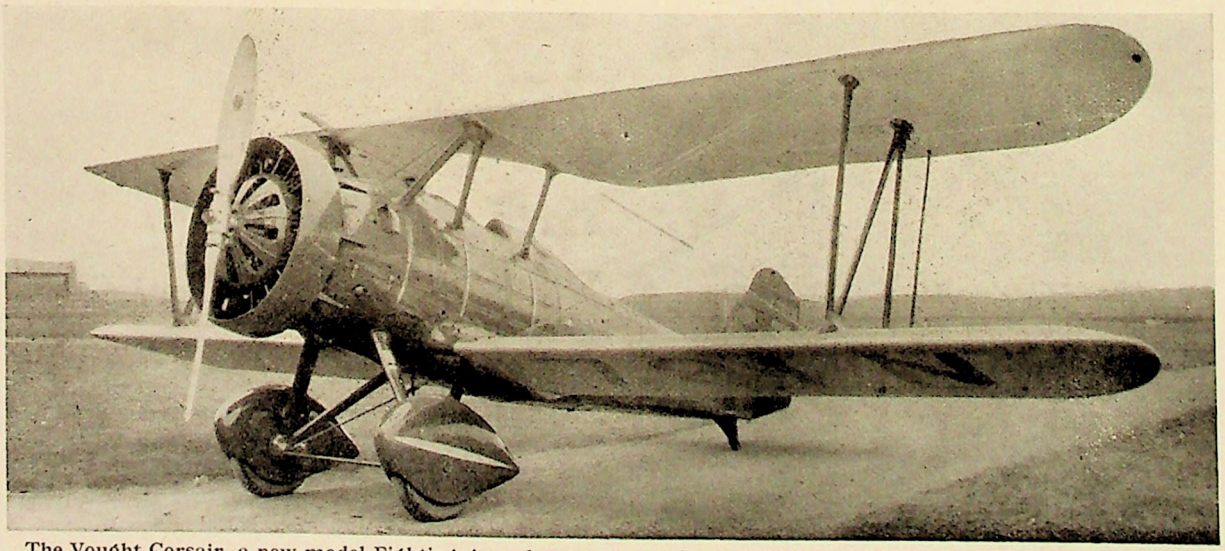


Photos by Courtesy of "The Shanghai Times."

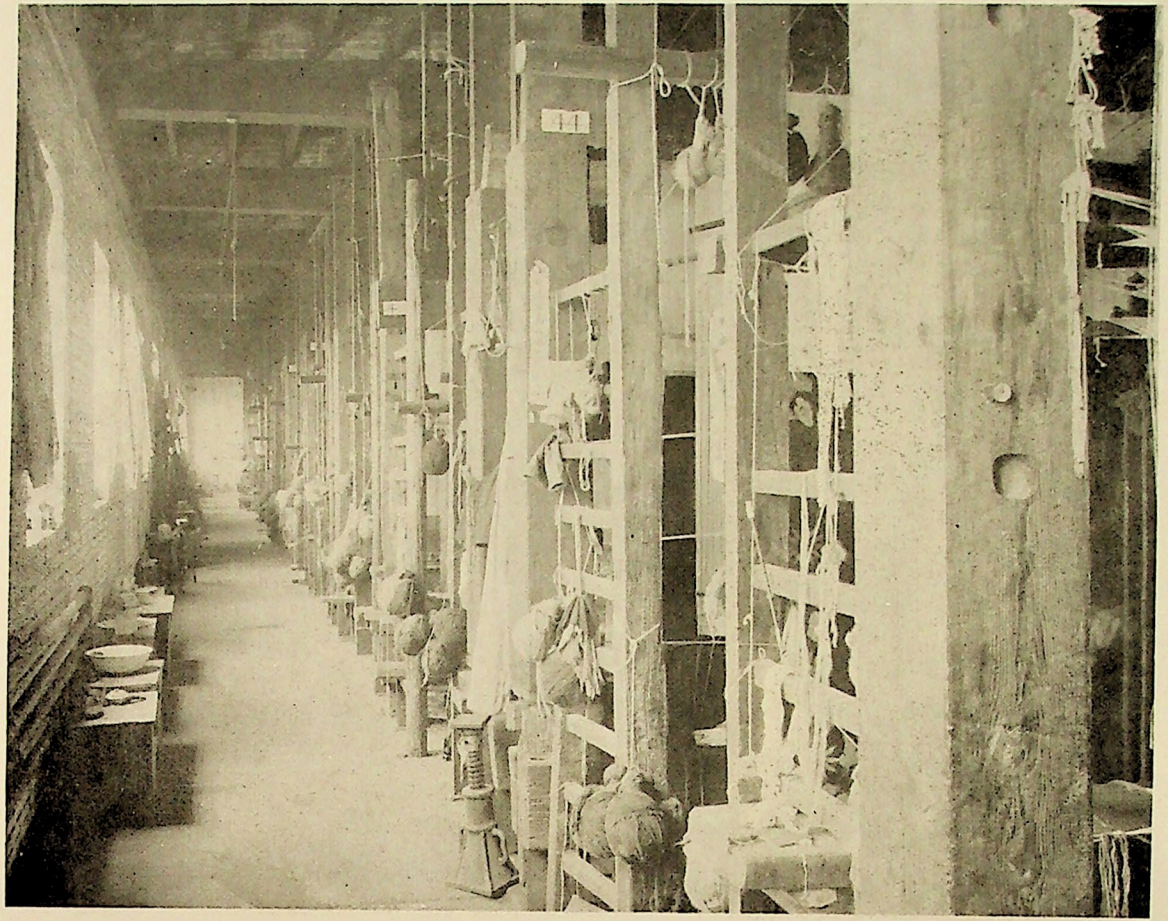
Officials of the Ministry of Railways, Mr. A. Malcolm of Messrs. Malcolm & Co., Ltd., Agents for Messrs. Swan, Hunter and Swigham Richardson, Ltd. the Builders of the "*Changkiang*," and some of the Members of the Crew.



Fleet Model No. 10 of the Consolidated Aircraft Corporation as used by the Central School of Aviation at Hangchow as a Primary Trainer.



The Vought Corsair, a new model Fighting Aeroplane used as a Pursuit 'Plane and Light Bomber, and supplied to the Chinese Government by the United Aircraft Exports, Inc.



Inside the Nichols Super-Carpets Factory at Tientsin looking down a Row of Looms. This Factory is the largest of its kind in China, contains 200 Looms, employs 800 skilled Weavers, and has an Output of 20,000 Square Feet a Month.

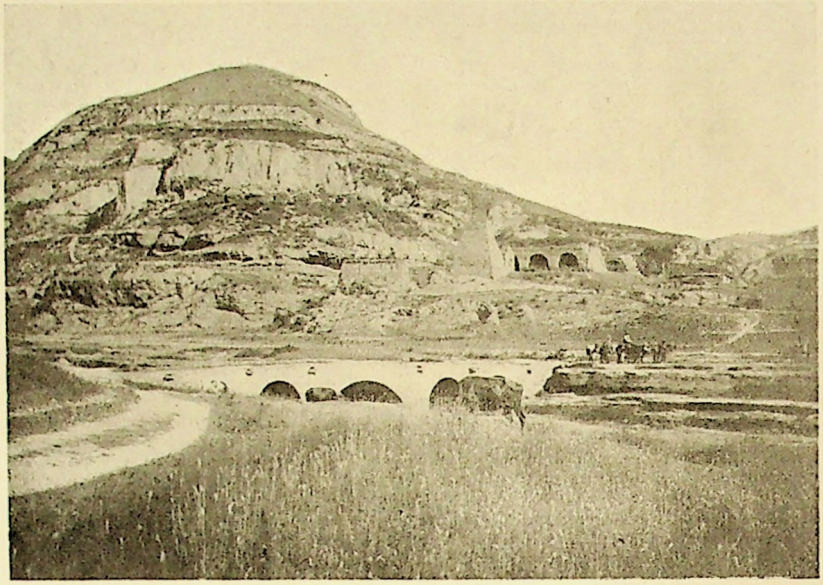


The Broken Country that fringes the great Mongolian Plateau in North China showing the Ravine leading to the Han-nor Pa Pass north of Kalgan.

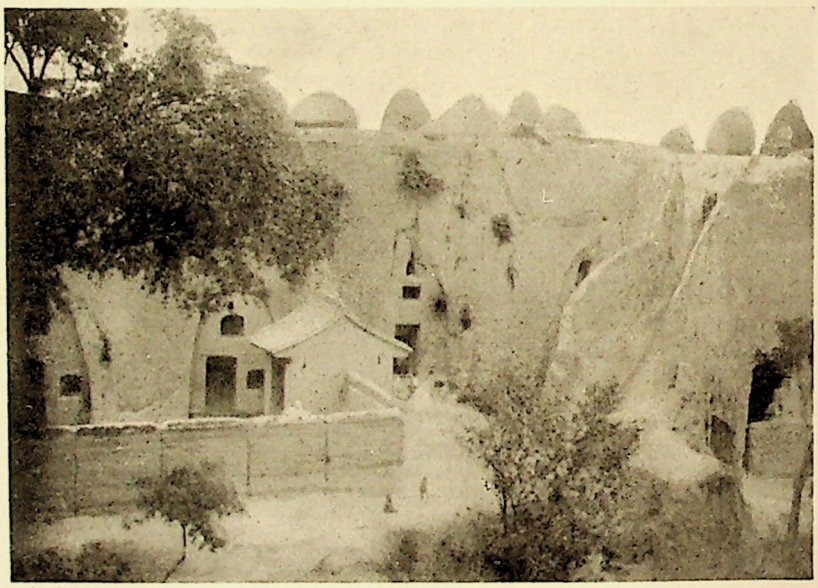


Photo by the Clark Expedition.

Magnificent Scenery in the Mountains of West Shansi. A deep Gorge in the Limestone Formation to the West of Fen-chou Fu.



In the Loess Country of North Shensi, where this strange Yellow Earth lies in Deposits of great Depth on Shale or Sandstone Strata.



Photos by the Clark Expedition.

Homes of Farmers in the Loess Cliffs in Deep Ravines that cut into this Formation in various Parts of North China. A Kansu Village. Note the Grain Stacks on the Plateau above.

FORESTRY

Timber Supplies for the World and China : The question of the world's future supplies of timber is an important one that has to be solved within a comparatively short time if a serious shortage of this valuable commodity is to be avoided. Man has always been criminally profligate in the way he has dealt with nature's most munificent gift, and has destroyed the forests of the world without any regard for his own future needs. Too late he realizes what he has lost through his wasteful methods of exploiting the great natural timber reserves, and then thinks about conserving what is left.

There is, of course, no reason why forests should not be exploited for man's use, but the mischief comes in when the trees are cut away and nothing is done to replant the areas thus denuded. This is what has happened on a wholesale scale in Canada and the United States, so that these great countries are now faced with a shortage of timber so badly needed in their great industries. The same thing, only on an even more wanton scale, has happened in China, especially in the northern provinces, where, not only is there a marked shortage of timber, but the whole country has become parched and arid, largely through the absence of the great forests that once clothed the mountains.

In the matter of replenishing timber reserves or creating new ones a remarkable lesson comes to us from New Zealand, where a wonderful scheme for creating and maintaining a continual supply of timber has been put into effect by a company known as the New Zealand Perpetual Forests Limited. It has been found that certain kinds of timber trees, notably the soft-wood coniferous trees such as the different species of pine, Douglas fir and California redwood, to which may be added such deciduous trees as the poplars, will grow in New Zealand at several times the rate they do in other countries, or perhaps it would be better to say that in a given period they grow to a far greater size in New Zealand than they do in other countries. This fact has enabled the Company to take up huge tracts of land, plant it with young trees of the above mentioned species grown from seed, and promise its shareholders a handsome return in the comparatively short period of twelve years. It has already been shown by actual instances that as much as £500 and more profit can be realized on an acre of land so planted in twenty years, whereas in other countries it would take fifty or sixty years.

The scheme, as far as the investor is concerned, is simple enough. A £30 bond is taken up and paid for in cash (£27) or by instalments over three and a half years in easy sums, £1-10-0 per bond with application, a similar sum one month later, and £2 per bond every three months thereafter till the balance is paid. The bond matures in twelve years, when the holder has the option of realizing on it by giving orders to sell the timber on his land, or of retaining the timber for a better price when the trees are older. It is estimated that a £30 bond will realize something like £250 in twelve years or £500 after twenty years, if the timber is marketed rightly.

The chief use for this timber will be its conversion into woodpulp, for which there is a ready market, not only in New Zealand itself, but throughout the world. There is an office of the company in Shanghai.

The lesson to China is obvious, namely, the starting of properly organized and wholesale afforesting of the mountains, especially of the northern areas, where there is unlimited country available and suitable for such development. There is really no need for China to be so short of native timber if the Government will only encourage afforestation schemes, and undertake to afford protection to the planted areas. It might even be suggested that the Chinese Government should copy the United States in the big forestry plan of giving employment that has been inaugurated under the Roosevelt régime.

INDUSTRY

China's Industrial Resources : While China's resources are to a large extent agricultural, it must not be imagined that she has not at the same time vast resources that come under the heading of industry. Even agriculture is an industry, for that matter, and if we stop to think we must realize

that it is in a sense the chief basal industry of all the other industries in the country, except those connected with mining. For it is her agriculture that supplies the raw materials of most of China's native industries. China imports very little in the way of raw materials.

It will be realized how vast in the aggregate are China's native industries when it is taken into consideration that at a conservative estimate at least seventy-five per cent. of the needs of her 475,000,000 inhabitants are supplied by native made goods, and, by comparison, only a very small proportion by imported articles manufactured in foreign countries. The significance of this statement can only be fully appreciated when it is understood that the Chinese are in no sense a primitive people, but a highly civilized one, which means that their requirements in the way of articles of use are very extensive : not, perhaps, on the average equal to those of a modern American, but sufficient to place them in the front ranks of the world's consumers. In view of the fact that there are thousands of native industries in China, it is impossible here to give even an outline of them.

Besides the purely native industries, most of which are carried on by small groups of workers, frequently by families, there have developed in this country in recent years industrial enterprises of very considerable scope based on those of foreign industrial countries and using Western machinery and appliances. These are the result of either foreign or native enterprise, combined or working independently, as the case may be, and are mainly concentrated in the vicinity of the larger treaty ports, such as Shanghai, Tientsin, Hankow, Canton and the like. In Shanghai these industries have assumed the greatest importance, and have made that city and port by far the most important industrial centre in the country to-day. Whole sections of this city are given over to such industries.

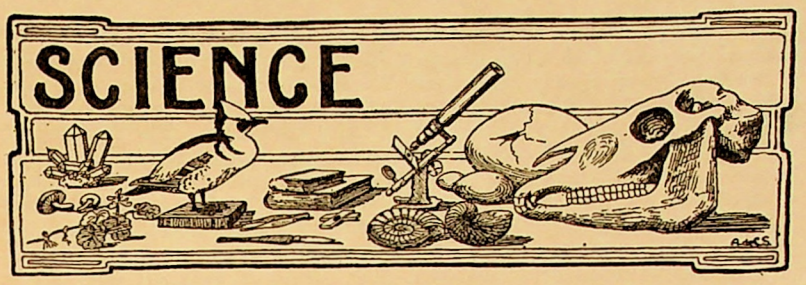
This does not mean, however, that Western style industries are not developing in other parts of the country. They are, and it is only a matter of time for China to become as highly industrialized as Japan. There is a great potential market for foreign machinery in China, and it is more than probable that in the not too distant future she will be calling upon industrial experts from foreign countries to teach her own people how to run such machines and generally to develop their own industries. China will certainly end up by manufacturing all she needs as well as all kinds of things that other countries need. She has a great industrial future before her.

COMMERCE

China's Foreign Trade : Although recently the foreign trade of China has fallen off, both in imports and exports, this can only be looked upon as a temporary decline due to the present disturbed political conditions and to the world depression. The latter has been responsible to a large extent for the decline in the export trade, since the manufacturers of Europe and America have not required the raw material and products which constitute what China mainly has to sell. This has naturally affected buying on the part of the Chinese, who have further refrained from spending money on account of the situation with regard to Japan.

Customs receipts do not show a very marked falling off of trade, but it would be fallacious to argue from this that there had not been a decline, since the tariffs on most imported articles have been considerably increased of late. In fact, it is not certain that the tariffs are not for the most part too high for a healthy state of affairs to exist. One thing is certain, and that is that the placing of a tariff on exports, as is done now, is not to the country's best interests. If this were removed the flow of trade might soon be increased, with benefit to all concerned.

That China's foreign trade must in the future assume enormous proportions is evident, for this country has the biggest population in the world, this population is growing steadily, and, most important of all, the people are developing a definite taste and desire for foreign articles, including preserved food stuffs, medicines, fabrics and wearing apparel of all kinds, utensils, implements, machines, and mechanical contrivances, books, art objects, musical instruments and what not. In spite of the development of factories for the manufacture of these articles in the country, the demand for imported articles will continue to grow.



THE ECONOMIC ANIMALS AND PLANTS OF CHINA

BY

ARTHUR DE C. SOWERBY.

With a history of between three and four thousand years of living on the land, it is not surprising that the Chinese have domesticated a large number of animals and brought under cultivation a great variety of plants. Indeed, it is but natural that we should find in China a greater variety of forms belonging to these two categories of living things than in any other country in the world, for, not only has she had a longer uninterrupted history of husbandry, but her territories are far more extensive and include a greater variety in their topography than most countries. At the same time she has been able to borrow extensively from other civilized areas, both near and far, and so further enrich her natural inheritance in animals and plants of economic value.

Economic Animals

Whereas in Europe and America the horse is the animal mainly used for draft purposes, that is to say, where mechanical power has not replaced it altogether, and other animals, such as the mule, the donkey and the ox, are used only to comparatively small extent, in China the mule, the donkey, the ox, the camel and the water buffalo rank equally as draft animals with the horse, some of them in certain areas being of considerably greater importance. The yak is extensively used as a pack animal in the territories along the Tibetan border, and away off in North-western Heilungkiang, one of the three provinces of Manchuria, the reindeer is, or was until comparatively recently, used as a beast of burden. China secures a large number of her horses, or ponies, from Mongolia, where they are bred by the Mongol Princes. Her mules mostly come from the north-west, Kansu and Chinese Turkestan. The great number of donkeys used in the north are mostly bred locally, the same being the case with her other domestic animals.

Neither the horse nor the donkey used in China appear to be domesticated varieties of the indigenous wild species, namely, the tarpan or Przewalsi's horse (*Equus przewalskii* Poliakow) and the kiang or Asiatic wild ass (*Equus hemionus* Pallas), respectively. They have evidently been brought in at some far distant period from the West. The Mongol or China pony, as it is generally called, may, indeed, be the result of crossing Western strains, including the Arab, with the tarpan; but the Chinese donkey cannot be distinguished from the beast used in Asia Minor, Europe and Africa, and undoubtedly has descended from the African wild ass (*Equus asinus africanus*).

In early times, to judge from Han Dynasty carvings and T'ang Dynasty clay tomb figures, the Chinese possessed much finer horses than they do now.

The origin of the oxen used in China does not appear to be known. The type found in the north is large and well suited to draft purposes; that of the Yangtze Valley and southward is small and is characterized by a hump, suggesting its possible derivation from the humped cattle of India. The water buffalo was probably indigenous in South China as a wild species. Its remains have been found as far north as Honan. It is still found in a wild state in neighbouring Indo-China and Annam.

The camel so extensively employed in the north is the two-humped or Bactrian camel, and its presence in China is due to the constant caravan trade that takes place between the latter country and Mongolia, where it alone can travel in comfort through the sandy wastes of the Ordos and Gobi Deserts. The vast shipments of tea to Russia in the old days when this trade flourished were always transported across the Gobi to Siberia on camels, the caravans taking off from Tientsin, Peking or Kalgan.

In the matter of animals that are used for food in China, their variety is truly astonishing. Besides all the domestic farm animals commonly eaten in the West, such as the ox, the sheep, the pig, the goose, the duck, the common fowl or chicken, the pigeon and the turkey, there are many others that figure on the menus of the Chinese. The goat, for instance, is universally eaten in China, while the dog is a favourite dish in the south, the water buffalo is consumed in the south and as far north as the Yangtze Valley, the yak is eaten in the west and the camel, the horse, the mule and the donkey in the north, though it must be stated that the last four are only eaten when they die from natural causes, and are never killed for food, except possibly in famine years.

The sheep of China is the broad-tailed variety, whose real home appears to be Tibet and Mongolia, where the huge fat tail that characterizes it is greatly esteemed as a delicacy. The wool is inclined to be coarse, though the flesh is excellent in flavour. Both sheep and goats are extensively bred in the northern provinces, especially along the Mongolian borders. In the Yangtze Valley and southward few sheep are kept, though most farms keep a few goats.

The domestic ducks of China have obviously been derived from the two main wild stocks, namely, the common mallard (*Anas platyrhyncha*, L.) and Swinhoe's duck or the yellow nib (*Anas zonorhyncha* Swinhoe).

The Chinese domestic goose is a descendant of the swan goose (*Cygnopsis cygnoides*, L.) and not, like the European variety, from the grey or grey lag goose (*Anser anser* L.).

The pigeon of China is known to science as *Columba livia intermedia* Strickland, and occurs in many domesticated varieties. The turkey, which is now extensively bred in areas about the Yangtze mouth and at various places along the south-eastern coast, has, of course, been introduced from the Europe or America, and is mainly bred for the foreign residents in China.

Added to the list of domesticated food animals, are, of course, all the numerous creatures of the chase, in which China is particularly rich. These, however, can be considered as forming part of the regular food of the people only in rural districts where hunting grounds occur close to the cultivated areas, more especially in swampy or lacustrine regions where water fowl of every kind abound, and in the wilder mountainous areas where wild pigs, deer of various kinds, wild sheep, serows, gorals and the many varieties of gallinaceous birds, such as pheasants, partridges and quails, are plentiful.

It is important to note, however, that in most cases the beasts and birds of the chase in China are hunted for other reasons than to add directly to the people's food supply. Wild pigs, for instance, are hunted and killed mainly because of the damage they do to the crops on farms adjacent to their haunts. Deer are hunted for their pelts or, in the case of the larger species, such as sika and wapiti, for their horns when in velvet or the unborn fœtus, both of which are considered of great medicinal value and fetch high prices. The musk deer is hunted exclusively for the musk carried in a pod on the abdomen of the male. Gorals and wild sheep are hunted for their pelts, which yield very fine "buckskin" leather. Large quantities of skins of muntjac, river deer, roedeer and antelope are brought from the interior to the coast and shipped abroad, the flesh of the animals from which these are derived being eaten locally by the hunters themselves. Pheasants, especially the more handsome species, and wild fowl, such as teal, ducks, geese and swans, are hunted more for their plumage and feathers than for their flesh. In this category must be included the bustard, which occurs in large flocks on the plains of the north. Eagles, falcons, hawks, owls, herons, storks and other non-edible birds are also hunted for their long wing feathers, from which fans are made.

Quails, the various species of wading birds, such as snipe, sandpipers and plovers, and the innumerable species of perching birds, such as larks, buntings, finches, warblers and many others, are captured mainly for food, though, of course, large numbers of the last named group are taken alive and sold as pets.

Before leaving the food animals of China, mention must be made of the great variety of strange animal products that are consumed in the country, which in their wide range include members of practically every class of living thing.

Fish, of course, head the list, but it is impossible here to do justice to this category. Suffice it to say that practically every single one of

the enormous number of species, fresh-water and marine, that may be included in the ichthyology of China, numbering over one thousand five hundred, finds its place in the dietry of the people of this country. The fishermen throw almost nothing away, not even the smallest fry that they take in their nets. All that cannot be disposed of while fresh is dried and either consumed by the fishermen themselves or sold to the poorer farmers of the immediate neighbourhood. There is no such thing in China as dumping fish back into the sea or using it as fertilizer on the land in order to keep up prices. The native fish merchant guilds have been known to prevent the distribution of cargoes of fish from foreign countries, such as Vladivostok, Japan and even Canada, but never have they been known to destroy the China product, all of which finds a ready market.

Besides fish the waters of China yield a great variety of edible creatures. Molluscs and crustaceans, commonly classed together under the name shell-fish, actually rival the true fish in importance. Fresh-water and marine crabs, prawns, shrimps and other species of crustaceans and related forms, including the strange horse-shoe or king crab (*Limulus longispina*), which frequents the southern and south-eastern coasts, are captured and consumed in vast numbers, being salted or dried for shipment into the interior. Immense quantities of bivalve molluscs, such as cockles and clams in infinite variety, and mussels, both fresh-water and marine, as well as of univalves or gastropods, such as the many species of marine whelk, winckle and nerite, and the riverine snails, are eaten daily in China, the capturing of them providing employment for considerable sections of the rural and coastal inhabitants. Such molluscs as octopods, cuttle-fish and squids are also eaten. The sea further yields such strange foods as jelly-fish and sea-cucumber, or bêche-de-mer, the Chinese being particularly fond of the latter. The former, taken in enormous numbers in the summer months, are salted down, when they form a crisp transparent gristly more or less tasteless substance extensively eaten by the poorer classes in the coastal provinces. Where cheap transport is available jelly-fish is also shipped into the interior in large wooden tubs or barrels.

The insect world, too, supplies its quota of food to the Chinese. Roasted grasshoppers and locusts, where they occur in large numbers, are sold and eaten in great quantities. The chrysalids and even the caterpillars of certain large moths are eaten in some places, while the bee is everywhere kept for its honey.

Through South-eastern and Southern China in the country districts various species of field rats and mice are eaten. In the interior mountainous parts of Fukien rat catching for food assumes almost the importance of a minor industry. Here the gigantic bamboo rat (*Rhizomys davidi*, Thomas) is in much demand as a table delicacy, as also is the scaled ant-eater or pangolin (*Manis pentadactyla*, L.). There are hunters who spend all their time after these creatures. Porcupines are considered a great delicacy, occurring from the Yangtze Valley southward ; while hedgehogs, which range roughly from the same latitude northward, are also greatly esteemed, though usually they are not hunted for super-

stitious reasons. The mole-rats (*Myospalax* or *Siphneus*) of the north are always eaten when caught, as also are squirrels. The flesh of the tiger, leopard and even the wolf is eaten as cures or preventatives of certain diseases.

The larger species of frogs are eaten everywhere, as well as the river turtle (*Trionyx*) and the terrapin (*Geoclemmys*) where it occurs ; while in South China snakes are eaten regularly.

Dried lizards, centipedes, scorpions and all manner of strange insects are eaten as medicines, into which category go the bones of the tiger, parts of various other animals, deer horn, and, strangest of all, the fossil remains of the animals of the past, both great and small. The fossil remains of the larger animals, mainly such as occur in late Tertiary or early Quaternary deposits in certain places in great quantities, are known as " dragon bones," and are consumed in powdered form. Many very valuable palæontological specimens dug out of the rocks of China have thus been lost to science. To-day such specimens are being offered on the market, as antiques and curios.

China's most famous dish, bird's-nest soup, is made from the nest of a certain type of small swift (*Collocalia*), which the bird makes from its own saliva and fastens to the surface of the rock high up in a cave or rock shelter. While most of this product consumed in China is derived from various places in the Malayan region, some is obtained in Szechuan and other western areas, where a species of this swift, *Collocalia inopina pellos* Thayer and Bangs, breeds.

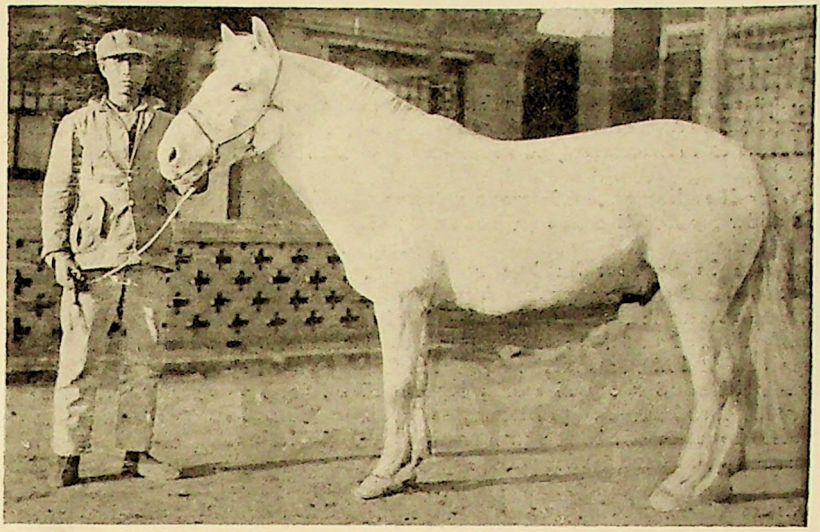
Important as are the food yielding animals of China, they are certainly not more so than those which yield non-edible economic products. But in listing the animals in this category, it will be seen, we shall mainly be repeating the names of those already mentioned either as food or draft animals. Thus the sheep, goat and camel yield enormous quantities of wool for export. Sheep and goats also yield skins, while horses, mules, donkeys, oxen and water-buffaloes, especially the last two, yield valuable hides, which are used locally or exported for leather manufacture. Pigs do not yield hides, as these animals are bred exclusively for food purposes and the skin is eaten along with the fat and flesh, but they supply a very valuable product in the way of bristles, which form one of China's important exports. Pigs also supply another export product in the form of their cleaned and dried intestines to form casings for sausages in Europe and America. Ox and water buffalo horns form another export product, and are also used in the manufacture of a number of objects in China itself.

The skins of deer, antelopes and other similar animals have already been mentioned as items of export, but there are many other skins and furs prduced in China that are of considerable importance in the markets of the world. Enormous numbers of mink skins, called " kolinsky " and " weasel " by the trade, are exported, as well as the skins of badger, fox, yellow-throated marten, raccoon dog, little panda, polecat, called " fitch " by the trade, wild cat, civets and the like. What is known to the trade as " pahmi " is a small and very useful skin that is exported in hundreds of thousands annually. It comes from the little ferret-badger,

known to science as *Helictis moschata ferreo-griseus* Hilzheimer, which is distributed throughout the Yangtze Valley and South-east China, with true *Helictis moschata* Gray in South China and Hainan, and other species in India and Malaya. Otter skins are secured all over the country, but nowhere in large numbers. Other furs and skins that may be mentioned are those of various squirrels, including the great dark red flying squirrel of the south-west, and the ubiquitous chipmunk, known to the trade as "burunduk." Skins of the long-haired golden monkey (*Rhinopithecus roxellanae* M.-Edw.) of Western Szechuan, Kweichow and Yunnan, find a ready market in China itself and but few if any are exported. The skin of the rare giant panda (*Aeluropus melanoleucus* M.-Edw.) is sometimes to be found in Shanghai fur shops. Tigers, leopards and wolves yield a goodly supply of pelts for both native use and export; while in the north, north-west and west valuable furs such as snow leopard, ermine, grey squirrel and stone marten are secured. For valuable furs in large quantities, however, we must turn to Manchuria, where the industry is very important, and such skins as those of the fur squirrel, the otter, the ermine, the pine marten, called Manchurian sable, and even the true sable itself, are collected from the trappers in the great forests to make valuable shipments to American and European markets. The pelts of lynxes, wolverines, the woolly tiger and the pale thick-coated leopard, wolves and bears, brown, black and grizzly, are also secured in Manchuria and exported in considerable numbers. From the plains of Western Manchuria and neighbouring Eastern Mongolia come great numbers of skins of the famous "tarabagan" or marmot, proved guilty of harbouring the germs of the deadly pneumonic plague. Before leaving the subjects of the Manchurian fur and skin trade we must not fail to mention the important industry that exists in the eastern areas of breeding dogs on extensive farms for the sake of their pelts, which are exported in enormous numbers from South Manchurian and North China ports. Formerly there was an extensive export business in the skins of the more brightly coloured pheasants, but, though the exportation of bird skins was prohibited some years ago, that of birds' feathers was still permitted, with the result that these birds continue to be of economic importance, since their feathers plucked from the skins are regularly shipped from the country.

In recent years the skins of certain snakes and lizards prevalent in the south have become items of export.

The lower orders in the animal kingdom also supply their quota of non-edible species of economic value, one of the strangest of which is the famous wax-insect (*Flata nigricornis*) of the south and west, which yields a white wax valuable as a hardening ingredient in the manufacture of native tallow candles. The honey bee, of course, also yields its wax. By far the most important economic insects in China are the silk moths, of which a domesticated form, *Bombyx mori*, and a wild form, *Antheræa pernyi*, occur, the cocoons of the former yielding the ordinary silk of commerce and the latter the famous tussore silk of Shantung and South Manchuria. There is no need to enlarge upon the importance of these, since all the world knows that silk is one of China's oldest and most



An unusually fine Specimen of the so-called China or Mongol Pony with clipped Mane and short Summer Coat.

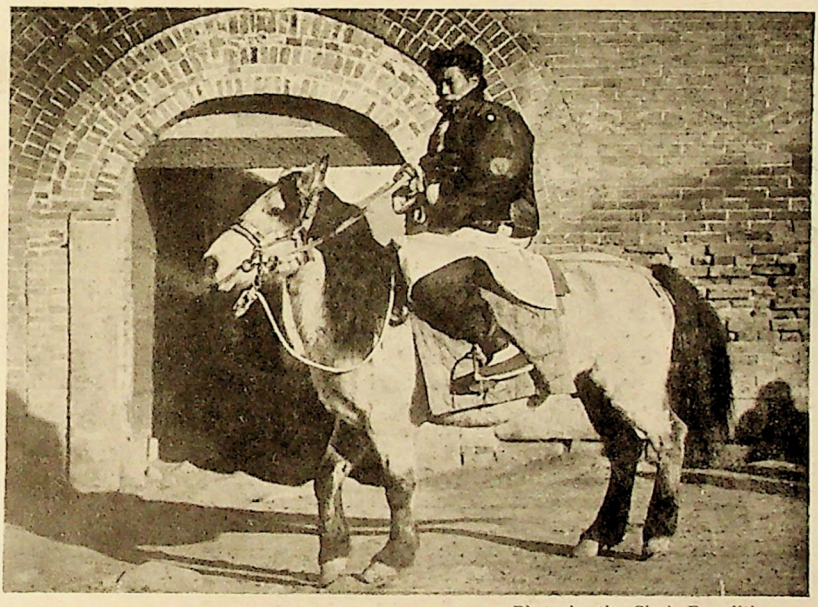


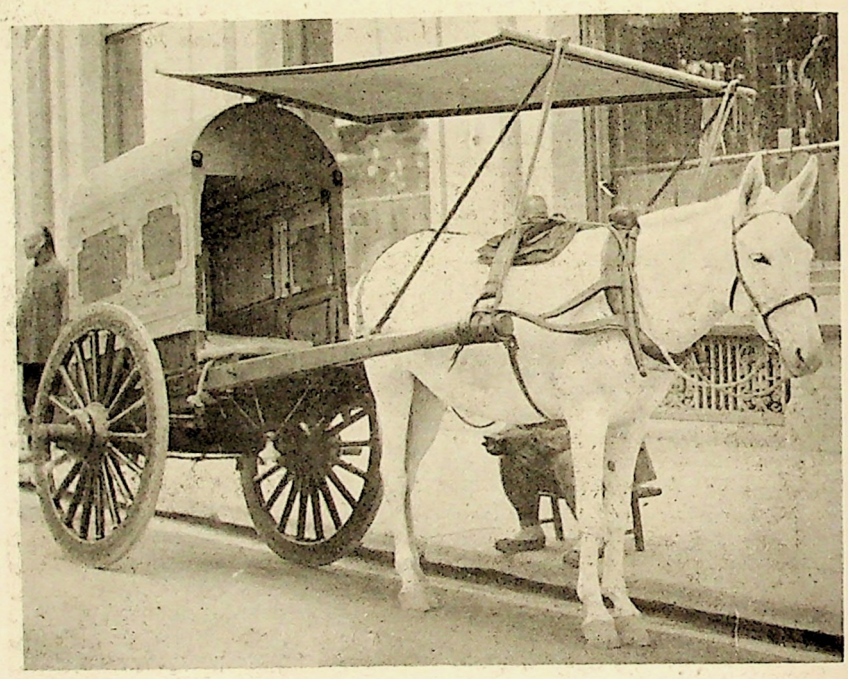
Photo by the Clark Expedition.

A typical China Pony showing well the long Winter Coat and heavy Mane.



Photo by the Kodak Shop, Tientsin.

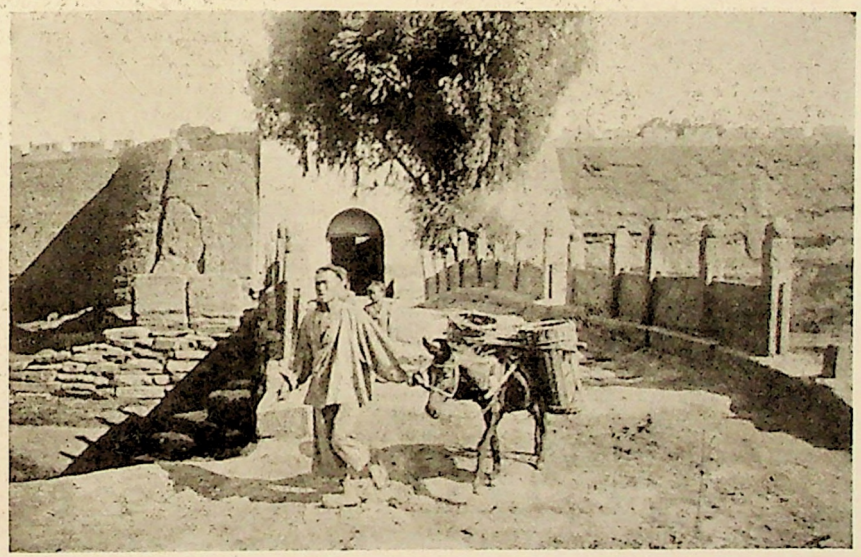
A typical Chinese Mule as used throughout the Northern Provinces for Draft and Pack Purposes. Usually the Mares are used for the former and the Stallions for the latter.



The large Type of Mule specially favoured for pulling Carts in the big Cities of North China.

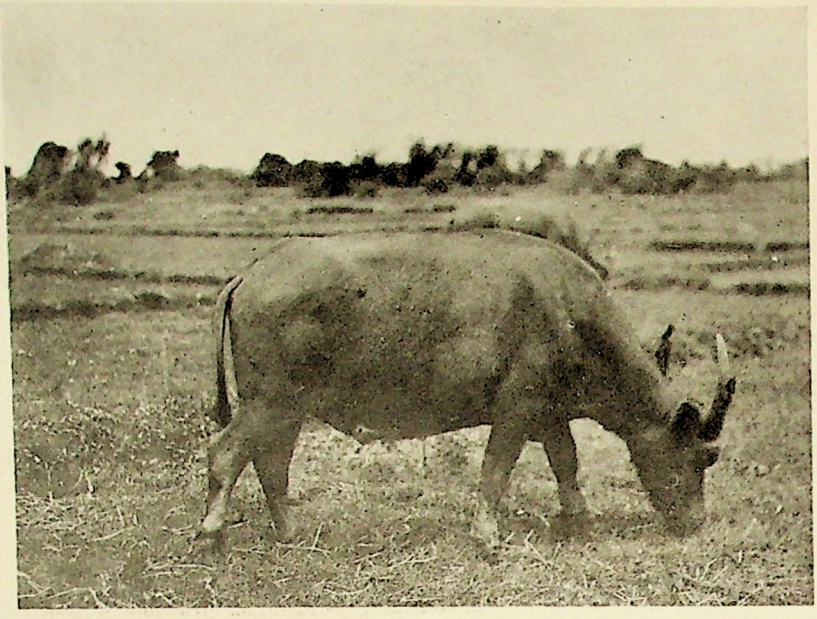


An Inn Yard in Kansu, North-western China, showing a typical Chinese Donkey enjoying a Roll after its Pack had been removed.

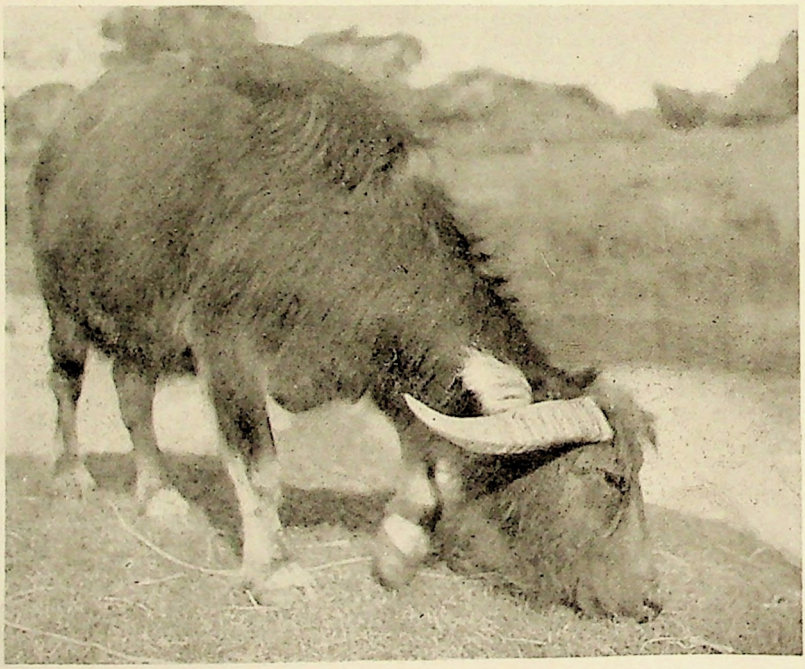


Photos by the Clark Expedition.

An example of the small Type of Mule used for Pack Purposes on Farms in North China. The larger and finer Animals are kept for heavy Transport Work on the great High Roads.



A fine Specimen of the Water Buffalo as universally used in China for Farming purposes from the Yangtze Valley southward.



A Hybrid between the Common Ox and the Water Buffalo. This type is frequently seen in the Lower Yangtze Region, where it stands the Cold better than the pure-bred Water Buffalo.



The small Humped Cattle of Central and South China, probably derived from India or Malaya, and possibly a Descendant of the Banteng or Tsaine



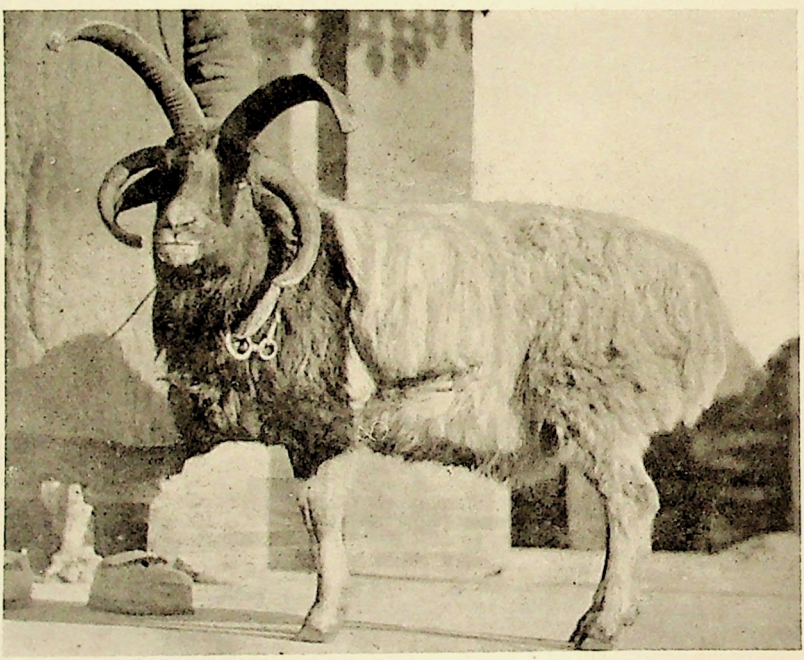
Photo by the Clark Expedition.

The large Cattle of North China whose Origin is still unknown, though it may be a Descendant of some wild Form, possibly the Gaur or Seladang, which once inhabited these Regions.



Photo by the Clark Expedition.

The Fat-tailed Sheep and Domestic Goat of North China. A Shepherd watering his Flock on the great Tai-yuan Fu Plain, Shansi.



A Freak Four-horned Ram of the Fat-tailed Variety of Sheep of North China and Mongolia. These produce an Abundance of coarse Wool, excellent for Carpet manufacture, and exported in great Quantities from Tientsin.



Camels outside the Walls of Peking, where they are still used to transport Coal from the Mines in the neighbouring Hills. Formerly the great Tea Caravans for Siberia started from here.



Photos by the Kodak Shop, Tientsin.

The North China or Mongolian Camel in its thick Winter Coat. Camel's Wool is an important Export from Tientsin.



A Camel Caravan entering the more fertile Country of Northern Mongolia after its long Journey across the Gobi Desert.



Photo by the Clark Expedition.

Cave Dwellings in Shensi, North China, with a typical North China watch Dog in the Foreground.



The Common Domestic Pig of China, characterized by its huge hanging Ears, wrinkled Face and coarse Coat of long black Bristles.



Photos by the Clark Expedition.

A Chinese Swineherd stopping to gossip with Passers-by while his Pigs enjoy a Wallow in a muddy Stream.



Photo by the Clark Expedition.

A Polecat (*Musteta larvata tiarata*, Hollister) from Kansu, North-west China. The Skin of the Polecat is known as Fitch, and is exported from China in considerable Quantities.

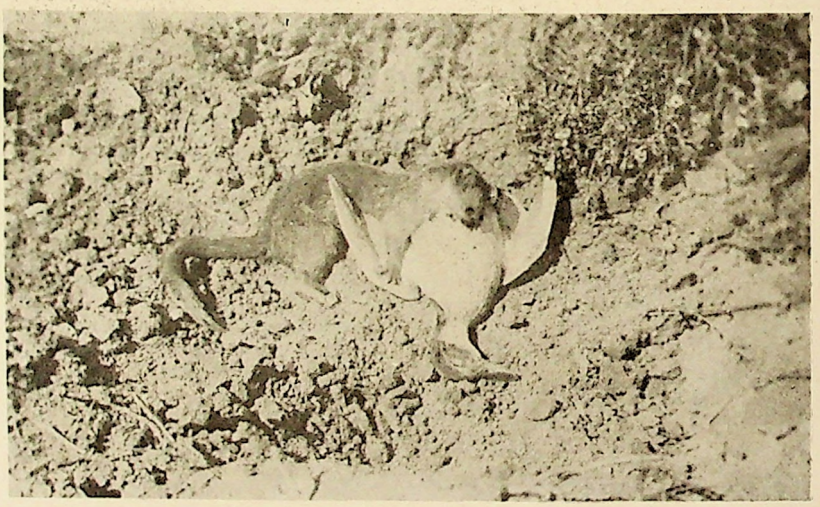


Photo by A. de C. Sowerby.

A Chinese Mink (*Mustela sibirica davidiana*, M.-Edw.) devouring a Teal. Under the name of Weasel and Kolinsky the Skins of the Mink are exported from China in enormous Numbers.



The Manchurian Yellow-throated Marten (*Charronia flavigula borealis*, Radde) Closely related Subspecies of this Fur-bearing Animal occur throughout China Proper.



Photos by A. de C. Sowerby.

The North China Chipmunk (*Eutamias asiaticus senescens*, Miller), whose Skin under the Name of Burunduk forms an Item of Export from China.



The Soya Bean. A Crop growing on the Farm of the Home of Onesiphorus in Shantung.



A Valley in Fukien showing the rich Vegetation of South-eastern China. Note the heavy Stands of Timber.



Photo by the Clark Expedition.

Poplar Trees growing beside a Village in North China, where they and Willows form almost the only Timber Supply of the Country.



Photo by A. de C. Sowerby.

Larch Trees growing at on Altitude of 10,000 ft. in the Tai-pei Shan, part of the great Ching Ling Range in South-western Shensi.

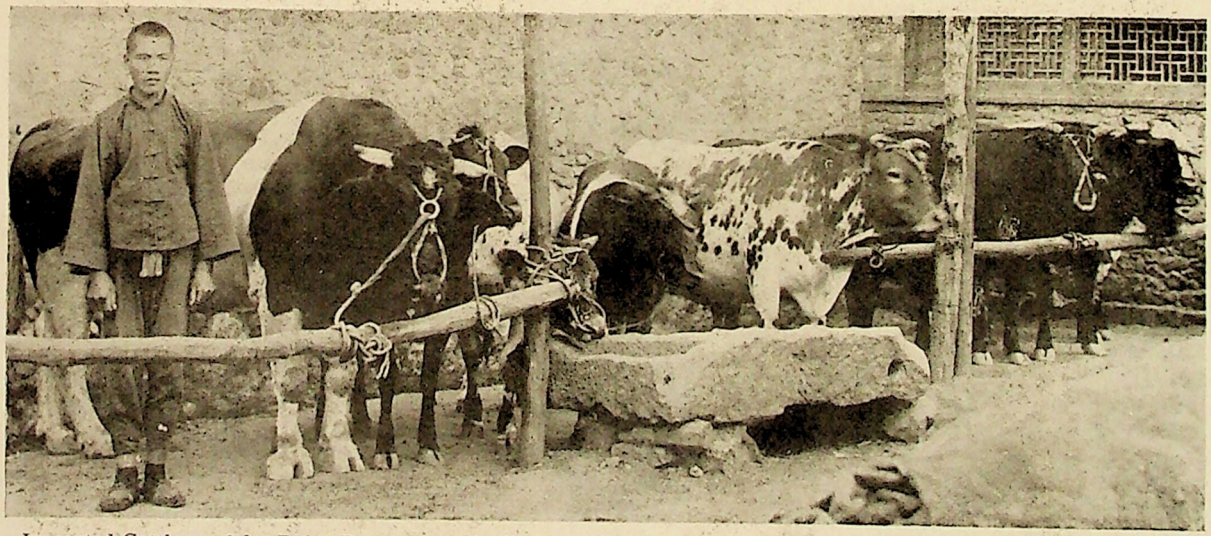


Bamboos at Mokanshan, Chekiang. The Bamboo is one of the most important Economic Plants of China, from the Yangtze Basin Southward.

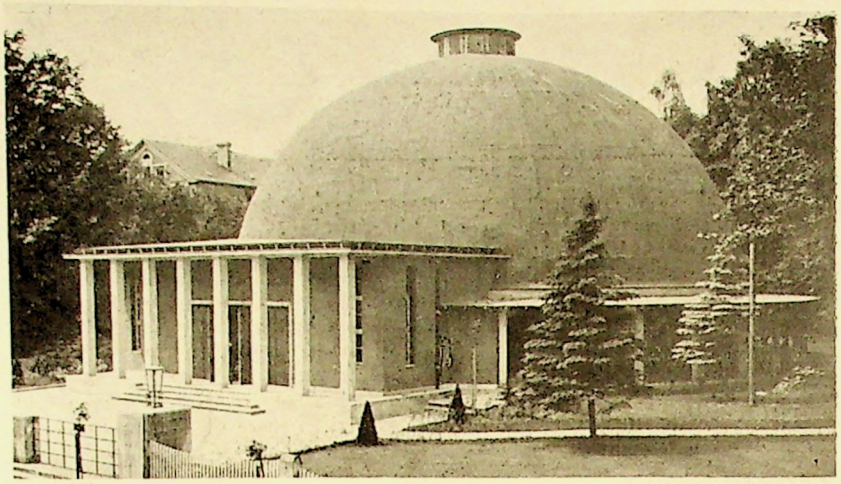


Photo. by the Clark Expedition.

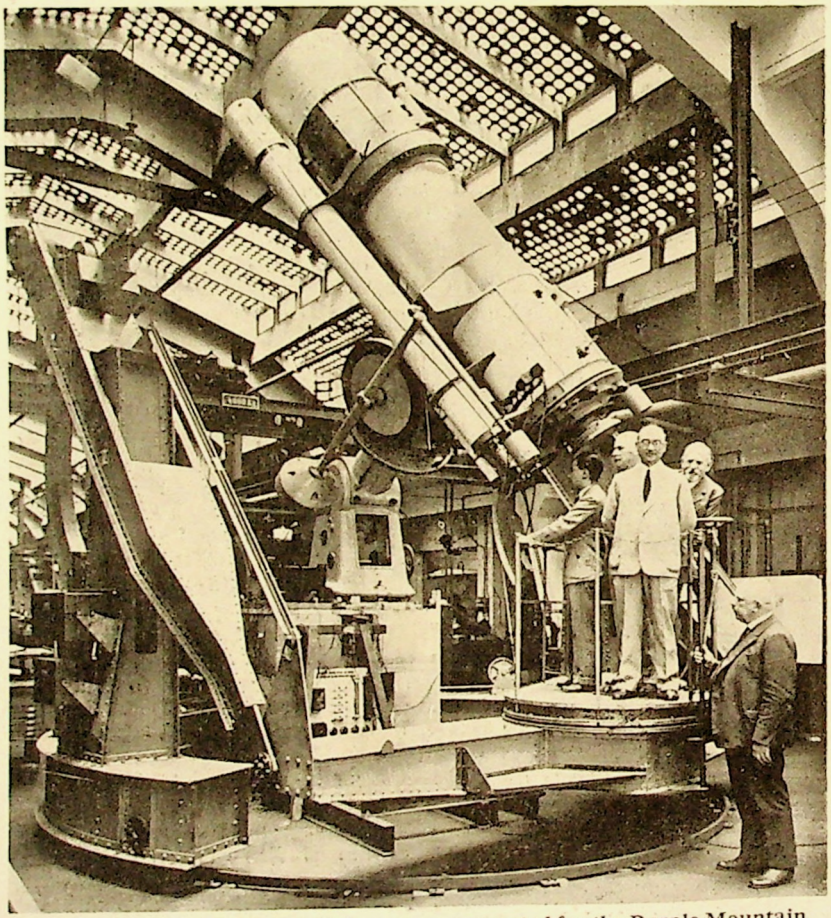
Willow Trees growing along a Road in North China, where they are as important as the Bamboo is in the South.



Imported Cattle used for Dairy Purposes at the Home of Onesiphorus in Shantung, where Babies and sick Children are nourished with the Milk so derived. There is a great Opening for Dairy Operating in China, where the native Cattle give little Milk.



The Zeiss Planetarium at Jena, Germany.



The New 24-inch Reflector Telescope, constructed for the Purple Mountain Observatory of the Academia Sinica by the ZeissWorks at Jena and recently delivered at Nanking, being inspected by His Excellency Liu Wen Tao, Chinese Minister to Germany. Messrs Carlowitz & Co., Ltd., are the Agents for Zeiss & Co. in China.

important exports, as well as a product universally used in the country itself.

Economic Plants

The silkworm and the wax insect, however, form, as it were, connecting links between the economic animals and the economic plants of China, since they both require plants on which to live. The ash (*Fraxinus chinensis*) and the privet (*Ligustrum lacidum*) are cultivated for the sake of the wax insects, while the mulberry (*Morus alba*), on the leaves of which the silk worms feed, is naturally a much cultivated plant of the very greatest importance to the country. It is grown everywhere on the farms of the Yangtze Valley and southward, forming one of their most characteristic features, lining the ridges between the rice fields or forming regular groves on raised embankments along the sides of creeks and canals. The caterpillar of the tussore silk moth feeds on the leaves of a species of dwarf oak that is extensively planted on open hillsides for the purpose where it does not occur naturally.

Food plants in China show an even greater diversity than do the food animals. Though, perhaps, in the matter of cultivated plants China is not richer than the countries of the West, the Chinese seem to have a greater variety of ways of using or serving up their edible plants, as well as using many kinds for food not generally eaten by the people of other countries. For instance, in no country in the world are so many species of fungus eaten as in China, and it is remarkable how well the Chinese country folk know the poisonous from the non-poisonous species. Gathering the numerous different kinds of edible fungus and drying, sorting and packing them for the market is a regular industry in all the more wooded areas. Some of the finer qualities, such as "white fungus," fetch a high price and are only served at the tables of the rich or at banquets.

Then, too, there are all the many kinds of seaweed, which the Chinese consider as delicacies, and which figure largely on the menus at their feasts. The tender young shoots of the *Ailanthus* tree, with their characteristic flavour, are cooked and eaten in the spring, or salted and pickled for later use. Bamboo shoots are a purely Chinese dish, as also are bean sprouts. The seeds of lotus, ginkgo, pine, sunflower, watermelon and pumpkin are all served by the Chinese at the table, and it was the Chinese who discovered the delectable qualities of preserved ginger. Their cooking is seasoned with a host of aromatic seeds and herbs unknown to the cuisines of the West. Many of these are cultivated, but still more are gathered in the wilds.

Many and diverse, too, are the fruits grown and consumed by the Chinese. Mangoes, mangosteens, papayas, lychees, lungans, cumquats, loquats, pumeloes, oranges and bananas in the south, pears, apples, peaches, plums, apricots, cherries, edible haws, persimmons, melons of all kinds, jujubas, a fruit that looks and tastes like a date but does not grow on a palm, grapes, mulberries and many kinds that have no popular European name in the Yangtze Valley and the north, offer a variety to the fruit lover that is hard to beat. In many of the more important coastal towns such purely Western fruits as strawberries, blackberries, logan-

berries, raspberries, red and black currants and gooseberries have been introduced and flourish. It should be noted, however, that in the wilder parts of the north and in Manchuria excellent wild forms of some of these are to be found. Thus in the high mountains of West Shansi we have found wild gooseberries growing abundantly in the stony ravine beds, red currants on the mountain sides, raspberries at the summits of the highest peaks, strawberries everywhere in the long grass, and even a kind of blackberry or dewberry amongst the rocks, all yielding reasonably large and excellently flavoured fruit. It is rather strange that the Chinese have not cultivated these delicious fruits as they have so many others.

Of what may be called kitchen vegetables the Chinese have an abundance. The ordinary cabbage (*Brassica*) alone occurs in extraordinary variety, from the choice Shantung cabbage, known as *pai-ts'ai* or "white vegetable," to the more inferior qualities of the poorer rural districts. Under the name *ts'ai-hua*, or "vegetable flower," the flowering stalk of rape, merely another variety of *Brassica*, is eaten with relish in the spring; while everywhere the coarser varieties of the plant are salted down for consumption in the winter. The swollen stem of kohl rabi, yet another variety, is salted and treated with soy sauce to form the universal pickle of China. The common cabbage, the cauliflower and the red cabbage of the West have now gained a firm foothold in the native market gardens of the coastal towns, or treaty ports, as they are called. Spinach and many other green vegetables are also grown everywhere, while garlic and onions are of extreme importance. Carrots, turnips, radishes, the last two in great variety, are grown everywhere. Sweet potatoes, yams, arrow-root, lotus-root and artichokes are tuberous vegetables of universal consumption in China, while the common potato, introduced a century or so ago by the Jesuit missionaries, has spread throughout the northern provinces, and is now one of the main staples along the Mongolian borders and in the highest mountains, where oats and it alone can grow on account of the generally low temperatures.

Probably the greatest variety in Chinese food plants is to be found in the bean family, which is also one of the most important to these people. The soya bean, in fact, is unquestionably the most important individual food plant, and it is not too much to say that if the Chinese had it and nothing else their wants would be amply supplied. Fermented, it yields all their different sauces which supply the basic flavouring of their food; pressed, it gives out oil which can be used for cooking; sprouted, it gives a fresh vegetable rich in vitamines; plucked in the pod while still green, it makes a delicious table dish; ground dry, it forms flour from which bread can be made; ground wet and curdled, it provides the famous bean-curd, a substitute for meat. Bean-curd itself is treated in many ways to yield a variety of different dishes. The soya bean also provides food for horses and cattle, while bean-cake, from which the oil has been expressed, is an excellent fertilizer.

As is well known the oil yielding and other qualities of the soya bean have made it assume the greatest economic importance in Manchuria, where its cultivation and exportation have reached truly vast

proportions, though, for various reasons, the bean-growing industry in that country has suffered a serious decline in the last three or four years. Beans, however, are grown extensively all over China, and, as already stated, their variety is greater than that of any other type of food plant.

Next in importance to the bean family, if not actually of greater importance, is the grain family, rice, wheat, kaoliang (or sorghum), millet (*Panicum miliaceum*) and maize being the chief staples of the country of this nature, with oats being grown in the extreme north along the Mongolian border and in the high mountains of Chihli, Shansi, Shensi and Kansu, where the summer season is too cold and short for other cereals to ripen. Rice is the great staple from the Yangtze Valley southward. Wheat and millet form the main staples of the northern provinces. Kaoliang, though extensively eaten by the agrarian population, is mainly used as animal fodder along with black beans, one of the many varieties of the soya bean. Buck-wheat, though not belonging to the grain family, must be classed with the cereals, and is extensively grown from the Yangtze Valley northward.

A shrub that must be included in the list of China's food plants, though it is not exactly a food, is tea, the cultivation of which is an industry of the greatest importance in all mountainous areas from the Yangtze Valley southward. Formerly China led the world in tea production and export, as her famous "black" teas were universally consumed; but to-day she has lost her great markets in Russia, Great Britain and other countries, supplying instead her own markets. Recently, however, there has developed a good market for certain kinds of Chinese "green" teas in North and West Africa, where this beverage is actually taking the place of coffee. Last year saw the biggest export of these "green" teas yet known. The chief trouble with the China tea-growing industry is that it is not organized properly, but constitutes a side line amongst the small hill farmers, who take little care of the bushes and pluck the leaves indiscriminately. In spite of this enormous quantities of tea are produced. If the Government could find some means of organizing the industry on regular plantation lines, there is every reason to believe China teas might regain their former importance in the world's markets. With their wonderful fragrance the Chinese "black" and "red" teas make a delicious blend with Ceylon or Java teas, whose strength is a desirable feature from the European tea drinkers' point of view.

Before passing on to the timber trees of China mention must be made of the extremely important group of trees which yield oils and varnish. Most important of these are the famous *t'ung* oil or wood oil trees of the genus *Aleurites*, the valuable product known as wood oil being extracted from the large seeds of *Aleurites montana* in South China and from *Aleurites Fordii* in Central and West China. The value of the export of the oil from these trees runs into many millions of dollars annually. The tallow tree (*Sapium sebiferum*) yields the important commodity known as "vegetable tallow," while the varnish tree (*Rhus verniciflua*) yields the varnish from which the Chinese make their wonder-

ful lacquer. Both these commodities are extensively exported, the trees that yield them being grown in the Yangtze basin and southward.

China, though possessing a great number of species of valuable wood yielding trees, is, on the whole, short in timber ; and, as a result, imports large quantities of soft woods, such as Oregon pine, and tropical woods, such as teak. This is due to the unrestricted destruction of timber which has always gone on in the country. Farming has always been the first consideration with this purely agricultural people, and the farmers have generally been allowed to cut away timber, regardless of whether or not it could be used, in order to sow new land. Within the last few years this has actually been witnessed by us and other foreign observers in such areas as the once strictly preserved Imperial Hunting Grounds in Jehol (north-east of Peking in the Tung Ling, or Eastern Tombs area) where pine and oak are the chief trees to be found, and the great forested mountainous areas of West Shansi, where fir and larch occur in immense stands. In both these places great stretches of magnificent forest have recently been destroyed, the timber being burnt or allowed to rot away, so as to allow new settlers to plant their crops. There is ample evidence to show that the greater part of China was once forested : the distribution of its fauna alone proves this. But the Chinese farmer is essentially a tree destroyer, and so, to-day, there is a very serious shortage of good timber over vast stretches of country. In the more or less barren north the only trees to be seen, often during days on end of travel, are the fast growing willows and poplars that are planted along the road sides and jealously guarded by the villagers for the sake of their wood. In these areas the timber for building and wood for furniture is almost all of this inferior quality. Where higher hills or mountains occur, pine is used, but usually the trees are not allowed to attain any appreciable size before being cut down and used for rafters in the roofs of the houses. Of late years the acacia has been extensively planted in Eastern Chihli and in Shantung, especially along the railways, mainly because it is an unusually fast growing tree.

Manchuria, of course, is a land of mighty forests, but even the great timber reserves of Kirin and Heilungkiang, especially of the former, have been outrageously exploited, and have shrunk enormously from what they were a few decades ago. Here pine, fir, walnut and oak form the best timber, with great quantities of white birch in the low-lying swampy areas and larch in the higher parts.

From the Yangtze Valley southward China is much more thickly covered with vegetation, and the question of an adequate timber supply is not as acute as in the north. Here the Chinese villagers actually go in for timber planting, in the more southerly areas the famous Foochow pine (*Cunninghamia lanceolata*) being extensively used for this purpose. There are numerous other valuable timber trees, however, far too many to be mentioned individually here ; and the people put their wood to various uses. Some of these woods are extremely beautiful and make handsome furniture. In Fukien alone some twenty or thirty different kinds of wood are to be had, ranging from dark or hard to light or soft varieties, and serving a great number of useful purposes. Indeed, some

of these might well be exported for use in foreign lands, and doubtless would be were it not for the great local demand for them.

While on the subject of Chinese economic plants used for constructional or manufacturing purposes, we must once more mention the bamboo, whose uses easily exceed those of any other type of plant. There is hardly anything in China, especially South China, that is not or cannot be made with bamboo—paper, household utensils of every description, weapons, musical instruments, scaffolding for buildings, fences, roofing, masts for ships and slats for their sails, rafts and what not. In certain towns in Fukien the piping for the whole water system, as elaborate as any system in Europe or America, is made from bamboo. There are a great many varieties of bamboo to be found in the country, from the mighty giant bamboos to the smallest of dwarf species used only as decorative garden plants. A strange type is the square bamboo, whose cross-section instead of being round is square.

Finally we come to the horticultural plants of China, whose name is Legion. Not only has China supplied the West with a great many garden plants which her people themselves have cultivated from wild species, but she has yielded a steady stream of new horticultural wonders as Western botanists have explored the wilder mountainous regions of the west and south-west. The Chinese are great horticulturists, and the growing and distributing of flowering plants and ornamental shrubs is not the least of the industries of the country.

THE NEW ROLE OF SCIENCE IN WORLD ECONOMICS

Hitherto the rôle of science in world economics has been almost exclusively the discovery of new chemical or other processes, the invention of new mechanical contrivances, or the improvement of the mechanics of production and transportation, and improvement in this case has mainly meant devising means for the saving of time and labour with the ultimate object of a reduction in cost. Almost all research work has had this end in view, directly or indirectly, and the value of most discoveries has been judged from this standpoint alone.

Of course, it must be admitted that a considerable amount of scientific research has been devoted to the investigation of problems that appear to have no bearing on practical economics, such as those connected with astronomy or the composition of matter or the structure of the atom, yet it is an undeniable fact that in the back of the mind of almost every scientist as he carries out his investigations is the hope that somehow some day he may stumble upon something that will prove to be of the greatest practical value to humanity. That is the only way

he can justify his work and the time and money spent on it. And, indeed, many of our most valuable discoveries have been made in just this way by scientists groping along lines of inquiry that as far as they could see were leading nowhere except to increased knowledge about certain things that had no economic significance whatsoever.

In a practical world it is hard for a scientist to secure the necessary financial support for his work unless he can hold out some hope of making a discovery or discoveries that will ultimately recompense those who finance him. Incidentally, it may be pointed out that as an actual fact it has often proved extremely difficult for a scientist to get financial backing even when he has had a highly profitable goal in view, so loath have financiers as a class been to invest capital in anything that did not show a prospect of immediate returns.

This fact makes it all the more remarkable that the big financiers of the world have not awakened to the fact that, in so far as they have employed them at all, they have been setting the men with the best trained and most constructive brains in the community at work upon a purely one-sided investigation, having failed to realize that efficiency in distribution is every whit as important as efficiency and economy in production. And by distribution is not meant the mere mechanical transportation of manufactured articles or raw products from one part of the world to another, but the intricate financial machinery that governs buying and selling, and makes it possible for the producer to receive his reward from the consumer. Yet this is just where our modern economic system has broken down, and where the capitalists could very profitably have employed some of their capital to support scientific investigation.

If at the same time that such men as Lord Kelvin, Sir Hiram Maxim, Thomas Edison and the like were making their revolutionary discoveries and inventions, others of equal mental ability and scientific training had been employed on investigating all the factors, social and otherwise, that influence the problem of distribution as defined above, and in correlating data and drawing up statistics, the world would probably not be in the mess it is to-day. Such effort as has been put forth in this direction has been more or less sporadic and carried on by individuals on their own initiative without any organized plan or concerted financial backing. The Technocrats, who have been in the limelight of late, represent one group of such sporadic investigators ; Major C. H. Douglas, with his system of social credit, another ; and writers, such as Sir Arthur Salter, Sir Josiah Stamp and G. D. H. Cole, yet others. But, with the exception of President Hoover's Research Committee on Social Trends, whose voluminous report appeared early this year, there appears to have been no concerted mobilization of scientifically trained investigators to carry out the important work of discovering ways and means of making distribution cope with production in our present day highly industrialized world.

Here, then, is a new rôle for the scientist in relation to world economics ; and it may be suggested that the leading industrialists and financiers of the world as well as the Governments of the more important

industrial countries should immediately mobilize an army of scientists to carry out a thorough investigation of our whole social and economic system, to compile and interpret statistics, and to gather and correlate data relating thereto—all with the express object in view of creating a system of distribution that will keep pace with the results of an ever increasing efficiency in production. It is only the scientifically trained who can accomplish such a task.

A. DE C. S.

CHEMICALS AND THE CHEMICAL INDUSTRY

To the scientist matter of every kind is a chemical, and chemistry is consequently the most comprehensive of all branches of science.

The chemist takes the materials of which the globe and its atmosphere are composed, endeavours to understand their nature and composition, and seeks to adapt them to the service of mankind. With this in mind it is easy to appreciate the universal application of chemicals, and to realise the broad foundation on which the modern chemical industry has been erected. From small beginnings huge commercial enterprises of world wide renown, such as the Imperial Chemical Industries Limited in Great Britain, the I.G. Farbenindustrie in Germany, Dupont de Nemours and Company and the Allied Chemical and Dye Corporation in America, Kuhlmann in France and many others, are engaged in supplying a vast range of products of direct use in themselves or of fundamental importance in other industries. Amongst the more important of these products in quantity and value may be mentioned acids and alkalies of various kinds, industrial or military explosives, organic solvents, chemical fertilisers, dyes, artificial silk, photographic materials, disinfectants and the ever-growing range of coal-tar drugs and medicines.

Equipped with splendid facilities for research and plentifully staffed with chemists, physicists, engineers and technologists of various kinds, the leading chemical manufacturers of the world pursue an unending search for new products or new applications of older products, and their labours are rewarded from time to time by achievements of revolutionary importance. Amongst these may be cited the growth of the coal-tar dyestuff industry in the latter half of the nineteenth century and the enormous developments which have arisen during the last twenty years from the manufacture of ammonia, ammonium salts and nitrates from atmospheric nitrogen. It seems safe to predict that the second half of the present century will witness another major development in the production on a commercial scale of fuel oils by the liquefaction of coal, thus providing an alternative source of supply to petroleum.

Passing reference may also be made to recent discoveries of great, although, perhaps, not of major, importance. The hydrogenation of

liquid oils to form solid fats and the great advance in the refining and deodorising of oils have made possible the production of wholesome and palatable margarine as one of the staple fatty foodstuffs of the world. The conversion of cotton or wood-pulp to viscose and cellulose acetate has given to the world new textile fibres of great beauty and utility, known as artificial silk, or "rayon," and by a similar process "cellophane," a beautiful transparent wrapping material, has been evolved.

The range of natural plastics and resins has been enriched and improved by synthetic products of many kinds, amongst which may be mentioned "bakelite" or "novite" moulding powders, and "paralac" resins for the paint, varnish and lacquer trades. The manufacture of vulcanised rubber has been greatly facilitated and improved by the discovery of a wide range of "vulcafor" accelerators, "vulcafor" dyes and "nonox" antioxidants intended to render rubber less perishable. Lastly may be mentioned the production on a commercial scale of "drikold" or solid carbon di oxide, which is finding a rapidly expanding use as an ideal refrigerant for the preservation of food. It is a substance far colder than ice, which is perfectly dry, and, on evaporation, turns into an innocuous odourless gas.

The present period in which we are living is as much a chemical as a mechanical age. To civilised man chemicals of one kind or another are a necessity, and to the operation of most industries they are indispensable. It is, therefore, not surprising to find that China is yearly increasing in importance as a market for chemicals.

There has long been in this country a trade in soda for domestic washing and cooking purposes, for glass and paper making, and for other industrial purposes; in caustic soda for soap making and mercerising; in bicarbonate of soda for mineral water manufacture; in chloride of lime for cotton bleaching and the sterilisation of drinking water, and in coal-tar dyestuffs for dyeing cotton, silk and paper.

During the last two decades sulphate of ammonia has been slowly but steadily introduced to augment the country's deficient supply of nitrogenous fertilisers.

Pharmaceutical products of the type of "aspirin" to counteract headaches and fever, and "914" for the treatment of venereal disease, as well as photographic developers and fixing agents are being required in ever increasing quantities. And, with the growth and diversification of industry in China, chemicals in ever greater quantity and variety are needed.

Nor will China remain entirely dependent on foreign countries for her supplies of chemical products. "Heavy" chemicals, including soda ash, caustic soda, silicate of soda, sulphuric and hydrochloric acids, are already being manufactured in China in substantial quantities. Plans are being laid for the manufacture of ammonia and sulphate of ammonia from atmospheric nitrogen, and dyes are being made in small quantities. The production of many other chemicals is being undertaken on a scale small as yet but destined to expand into large and prosperous industrial activity.

THE GEOLOGICAL SURVEY OF CHINA

A BRIEF ACCOUNT OF ITS INCEPTION, HISTORY AND ECONOMIC IMPORTANCE

The history of the National Geological Survey of China goes back to January of the year 1916, when it was founded as a separate institution under the Ministry of Industry.

Previous to this considerable interest had been shown in the geology of China, especially in regard to the mineral deposits, by various foreign financiers and scientific institutions outside China, as well as by the Chinese Government itself, and a Geology Section of the Department of Mines of the Board of Commerce and Industry had been maintained ever since 1912, the first year of the Republic, under Mr. H. T. Chang, a graduate of Tokyo University. In the *Proceedings of the Geological Society of China* he published a programme for the systematic geological survey of China, which later bore fruit in the establishment of the Geological Survey. The geology of China had been studied and reported upon by certain Western scientists, the most important surveys being that made by Baron Ferdinand von Richthofen in the years 1870-1872 and that by Baily Willis and Blackwelder of the Carnegie Expedition of 1903-1904. The results obtained by the former were embodied in the five volumes of his great work entitled "China," published in 1877, and those of the latter in the three volumes of "Researches in China," issued by the Carnegie Institution in Washington.

In Shansi, the great coal producing province of the north, Professor E. T. Nystrom of Shansi University had carried out extensive investigations on the mineral resources of the province, publishing his results in a useful pamphlet. Later, when the Nystrom Institute was formed in conjunction with the University close cooperation was maintained with the Government Geological Survey, and, as far as we know, this happy coordination of effort is still maintained.

Under the able leadership of Dr. V. K. Ting, its first director, and the energetic cooperation of Dr. J. G. Andersson, Mining Adviser to the Government, the Geological Survey made steady headway, till in the year 1919 a certain amount of equipment had been gathered together, while in 1922 a library, the first of the kind in China, was built in Peking to house its fine collection of books and maps on geology and related subjects. At present there are over 35,000 volumes of books and more than 15,000 maps in this library.

From the very beginning of the Survey's existence geological, palæontological and mineral specimens were collected from various parts of the country and a museum maintained. This has now become the leading institution of its kind in China, being housed in a large building in Peking, and exceedingly well laid out and maintained. In the latest report on the Survey it is stated that the museum contains something over 10,000 specimens on exhibition and fully ten times this number under study and not on exhibition.

This in itself is a remarkable achievement, but it is only one of the more spectacular results of the Survey's work. In the securing of these specimens the whole country has been gone over, reports and maps made, and mineral deposits investigated. The results of these investigations have been published from time to time, and the Survey now has a magnificent series of papers, fascicles and the reports to its credit, appearing in its two main publications, the *Bulletin of the Geological Survey of China* and *Palæontologia Sinica*. Several sheets of a General Geological Map of China on the scale of 1 : 1,000,000, with explanations, have also been issued to date, while the Survey further issues the following publications : *Geological Memoirs ; Statement of the Chinese Mining Industry ; Seismological Bulletin ; Contributions from the Fuel Research Laboratory ; Soil Bulletin ;* and miscellaneous papers and reports.

Since 1928 the Survey has acquired several more buildings to house new departments, and to-day it has within its organization, besides the Library and the Museum, a Palæontological Laboratory, including a Cenozoic Research Laboratory ; a Fuel Laboratory, including a Mineralogical and Petrographical Laboratory, a Chemical Laboratory, a Palæobotanical Laboratory and a Photographic Department ; a Soil Laboratory ; and a Seismological Station, the last situated in the Western Hills.

From the economic point of view the most important work of the Survey is, perhaps, that connected with the investigation of the mineral resources of the country, which has been carried out by a number of experts, both foreign and Chinese, with very interesting results.

For instance, the total reserve of iron deposits that exist in the country have been calculated to amount to about 1,000,000,000 tons ; while the iron ore industry has been completely dealt with in a two volume monograph with atlas. Almost the whole of the coal deposits in China have been surveyed, the results being embodied in thirty-one detailed reports, with maps, published in the *Geological Bulletin*. A number of special works on the coal mining industry have also been published. The latest estimate places the total coal reserve of China at about 260,000,000,000 tons. The presence alone of these two minerals in such enormous quantities ensures the future industrial prosperity of China, but it has been shown this country is rich in others. Copper, tin, antimony, lead, quicksilver and other deposits have also been investigated and reported upon, especially those lying within easy reach of existing railways ; and when China has an adequate code of mining laws that safeguard the interests of mine owners and investors in mining enterprises, we may expect a great boom in this direction in the country.

The mineral substances and ores themselves have also been carefully studied ; while the research carried out upon fuel has proved of the greatest economic importance. Research upon soils is another economically important activity of the Survey.

The research carried out upon palæontology and seismology by the Survey while not of any very great immediate economic importance, have proved of the very greatest interest to scientists, opening out whole new vistas into the past faunistic and botanical history of Asia,

and culminating in the world rousing discovery of Peking Man (*Sinanthropus pekingensis*, Black). Western scientists of the highest qualifications and reputation have been engaged by or have co-operated with the Survey in this field, and to day a mass of the most interesting and scientifically valuable information has been gathered together such as exists in few other countries outside Europe and North America.

A close association is now maintained between the Geological Survey and the Academia Sinica in Nanking and the National Academy of Peiping, as well as with the Geological Society of China.

In the splendid way it has been organized and has carried out its work, the National Geological Survey of China is truly a credit to the country and an object lesson as to what the Chinese as a people can do in following the lines of and adopting the culture of the West.

A. DE C. S.

NEEDED, A BIOLOGICAL SURVEY OF CHINA

With the splendid work that has been accomplished by the Geological Survey before them as an example, the zoologists and botanists of China, it may be suggested, would do well to organize a Biological Survey of the country, for such is urgently needed. It is not meant to suggest that the Chinese biologists are not working hard and accomplishing a great deal. On the contrary, they must be given the greatest credit for the splendid work they are doing, as evidenced by the number of journals devoted to the publication of the results of zoological and botanical research that now make their appearance regularly in this country. From these it may be gathered that a considerable number of Chinese zoologists and botanists are busy making collections of animals and plants from all parts of the country, identifying or getting experts to identify the specimens, and describing any new species or subspecies they may discover. But, as far as can be made out, there is no definite coordinated plan in the surveying of the fields of zoology and botany in China, the efforts of the different natural history and biological societies being scattered and independent. To what extent if any these institutions receive financial support from the Government we cannot say, but it would seem that the latter has not undertaken a regular survey of the country's biological resources as it has done in the case of its geological resources. And it is suggested here that such a biological survey is every whit as important as a geological survey, and will inevitably yield results as valuable.

The saving in losses to the farmers through the elimination of noxious insects and the eradication of plant disease alone would more than repay the country for the expense entailed in inaugurating and maintaining such a survey. The conservation of the country's resources

in the way of food fish, game birds and fur-bearing animals, which could only be accomplished after a proper survey has been made, would further add to the country's wealth. And who can say what new and economically valuable plants may not be discovered in the course of a thorough investigation of the country's flora ?

It is here suggested that the Chinese Government should forthwith decide to inaugurate a Biological Survey of China ; establish adequate museums and laboratories for the purpose in some important centre, Shanghai, for preference, since this city is the most easily accessible from all parts of the country, including the coastal areas ; engage the necessary staffs of properly qualified scientific workers ; and publish the results of their investigations in the same way that the Geological Survey has done. Branches might be established in the capital cities of each province, the results of the work carried on at these being sent to the main centre for recording and publication.

Obviously a Biological Survey of this nature would have to be divided up into departments, and, to start with, the following might be suggested : an Entomological Department ; a Department of Fisheries ; a Game Bird and Animal Department ; a Department of Furs ; a Department of Plant Diseases ; a Dendrology (Trees) Department ; a Domestic Animals Department ; and an Economic Plant Department. Where necessary each department would have its field workers and collectors ; while the museum or museums in which the specimens could be housed would naturally constitute separate departments with their own regular staffs.

Not only would such an undertaking be of the greatest economic value to China, but it would immediately provide occupation for a large number of the steadily increasing body of young qualified scientists in this country, who at present find it extremely difficult to secure congenial employment. The Government must not overlook this important factor in China's economic life. If it sees fit to educate its young people in the way it is doing, it must at least do all in its power to provide them with the work they are qualified to undertake.

A. DE C. S.

SCIENTIFIC NOTES AND REVIEWS

BIOLOGY

Entomological Society's Centenary : A hundred years ago this month the Entomological Society of London was formed by a group of enthusiasts, the inaugural meeting taking place in the Thatched House Tavern in St. James' Street, on the present site of the Conservative Club. It has been decided to celebrate this important Society's centenary on May 3 and 4 at its head quarters at 41 Queen's Gate, South Kensington, the freehold of which was purchased in 1921.

From its very inception the Society has been an important and flourishing one, but it was during the World War that its usefulness became fully appreciated by the authorities, who called upon its members to assist in combatting the insect pests that made such ravages upon military stores in the way of food and clothing and caused so much sickness amongst the troops. The importance of entomological research in the matter of eradicating insect pests on farms and plantations was also emphasized at this period. Since then enormous strides have been made in this direction, and in many places the most virulent of man's enemies of the insect world have been effectively controlled, such as the leaf-hopper that almost wiped out the Hawaiian sugar plantations, the small moth known to science as *Tirathaba rufivena* Walker, which was causing great havoc in the coconut plantations of the islands of the South Seas, and, of course, the well known malaria and yellow fever mosquitoes.

One of the most effective means of combatting such pests has been the search for and introduction when found of some parasite of the pest; and to accomplish this trained entomologists have been sent all over the world to find the necessary parasites.

Another interesting example of the value of entomological research is the recent successful attempt to get rid of the prickly pear, which has become a pest in certain parts of Australia, by the introduction of an insect named *Cactoblastis* which feeds upon this cactus and kills it. Here an insect is used to control a plant pest.

Housed in the Society's building is the Imperial Institute of Entomology, the British Government's reaction to the realization of the enormous value and importance of entomological research.

The fellowship of the Entomological Society of London now numbers nearly seven hundred, and includes practically every entomologist of note in the British Empire, as well as many belonging to other countries.

The present would be a fitting time for China to organize an Entomological Department, preferably of the Agricultural Department of the Ministry of Industry; unless, of course, the Government adopts our advice and establishes a Biological Survey of China. Meanwhile it might be suggested that the Chinese entomologists should get together and form a Society of their own, with a view to studying the insect fauna of this country, and its bearing upon economics. There is an enormous amount of work in this direction to be done.

The War upon Locusts: News has recently reached us that Yugoslavia, Hungary and Rumania have formed a "triple alliance" against their common enemy the locust, and have embarked upon extensive preparations for a war of extermination to commence this spring. Experts in chemical warfare have been called in, says a *Reuter* message, and joint action on a wide front has been carefully planned, the attack upon the insects to commence immediately they make their appearance.

In view of the locust menace in certain parts of China, it would be well if the proper department of the National Government were to secure full details of the preparations, progress and success or otherwise of this campaign, with a view to organizing and carrying out a similar one in China. This is one of the things a Biological Survey, as outlined elsewhere in the present issue of this journal, might undertake.

SEISMOLOGY

A Quiet Month: April this year has been a comparatively quiet month as far as seismological disturbances are concerned. Only two earthquakes of any importance have been reported in the world's press. The first of these took place on Khos Island on the Spordes group to the west of Asia Minor in the Aegean Sea on April 23 (or thereabouts), the loss of life and destruction of buildings being reported as very heavy. Altogether a hundred and nineteen people were reported killed and over six hundred injured, while five thousand were rendered homeless.

The second important earthquake occurred in the region of the Aleutian Islands at 1.28 on the morning of April 27. Considerable damage was done in the islands and also in the Kenai Peninsula, where the shocks

were reported to have been the most intense ever recorded in that territory. The Augustine Island, off Kamisha Bay in Cook Inlet, was reported to have been blown up by volcanic action. No details of the disaster have so far been received, but it was feared that there must have been a very heavy loss of life.

Earthquakes in China : Considering the size of the country and her proximity to the notoriously bad earthquake area of which the Japanese Island seem to form the centre, China is remarkably free from serious seismic disturbances. It is not often that even mild tremors are recorded in any part of the country, with the exception of the extreme north-west, where, however, in the province of Kansu on the Tibetan border, three very serious earthquakes have occurred in recent times. The first of these was in 1922, when an enormous amount of damage was done and there was a great loss of life. The second was in May, 1927, and was reported as one of the worst ever recorded, causing even greater loss of life than the one in 1922. The last one occurred in August of 1932, the loss of life and damage to property being considerable.

The reason for this area being subject to such strong seismic disturbances is not definitely known, but it has been suggested that it is in some way connected with a series of fault lines that are known to exist in a great curve running in a north-east to south-west direction diagonally across the province.

ASTRONOMY

The Nanking Observatory's new Telescope : Early in March the arrival in Nanking was reported of the big 24-inch reflector telescope, which had been constructed for the Purple Mountain Observatory of the Academia Sinica by the Zeiss Works in Germany, Messrs. Carlowitz and Company being the agents in China through whom the order was placed.

This is the largest instrument of the kind in China, and its installation next June under the supervision of an expert from the Zeiss works at Jena will mark an epoch in the study of astronomy in this country, which, it may be noted, goes back to very early times amongst the Chinese.

The telescope is principally intended for photographic work, and is well fitted with devices of the greatest precision to enable this delicate work to be done, even in the case of the most distant stars, when long exposures are necessary, calling for the movement of the telescope in exact time with that of the earth as it turns on its axis. The observer can move his platform, the telescope, the stage and the dome, all by the pushing of electric buttons. The weight of the instrument is 6,600 lbs.

In the accompanying illustration the telescope is shown with His Excellency Liu Wen Tao, Chinese Minister to Berlin, on the platform making an inspection at the Zeiss Works before it was shipped to China. At the same time His Excellency visited the Zeiss Planetarium (shown here in the illustration above that of the telescope) and was given a view of the stars as they would appear in the skies at Nanking.

METEOROLOGY

April Weather Record in China : Except that the greater part of the month was unusually cool with what at least seemed to be a greater proportion than usual of rainy days and cold winds, there is nothing outstanding to report in regard to the weather experienced in the Yangtze Delta region, in which Shanghai lies.

The same appears to have been the case in other parts of China, for no weather news has been received in Shanghai from the outports or interior cities. It may be noted that anything unusual is always reported.

The Economic Importance of Siccawei Observatory : The splendid work carried out by the Meteorological Observatory at Siccawei (Zikawei) on the western outskirts of the French Concession in Shanghai in the way of collecting meteorological data from numerous stations and issuing daily weather reports as well as warnings to

all shipping in the China and Japan seas of the position of typhoons during the season for these terrible cyclonic storms is of the utmost economic importance. With the data thus supplied of the speed at which they are travelling and the direction they are taking, the captains of ships in the neighbourhood of typhoons are often able to avoid the worst parts of the latter; while ships in harbour anywhere along the China coast are kept fully informed of the presence, if any, of these storms and of any other weather conditions that may affect their safety. Siccawei Observatory receives hourly reports of weather conditions from stations as far apart as Irkutsk on Lake Baikal in Siberia and Yap Island in the Mid-Pacific Ocean, as well, of course, as from all China ports, various places in Manchuria, Japan, the Philippines and the Malay region, a total of forty-seven stations.

MEDICINE

Public Health in China: That China is fast coming into line with Western countries in the matter of looking after the health of the public is evidenced, not only by the facts that most of the larger cities of the interior and all of the so-called Treaty Ports now have their Public Health Departments while missionary and other enterprises have established hospitals all over the country, but also by the fact that there now exists a well organized National Quarantine Service. Under the able directorship of Dr. Wu Lien-teh, formerly of the Manchurian Plague Prevention Service, assisted by the senior quarantine officer, Dr. Wu Chang-yao, this national institution for safeguarding the public health has now completed its third year. The third series of the "Reports of the National Quarantine Service" has recently been issued in the form of a large volume of over three hundred pages, profusely illustrated with maps, diagrams and charts. It constitutes a comprehensive survey of health conditions in China to-day as well as of Asia and the Far East, and may be recommended to any one wishing for information in this direction. Amongst the more important subjects dealt with are the severe cholera epidemic which swept China during the spring and summer of 1932; the measures taken to ensure pure water supplies for the people of China as a means to combat such epidemics; an extensive survey of the rat-infesting fleas of the Chinese ports in relation to the incidence or absence of bubonic plague; and a new survey of plague in wild rodents and of the pneumonic plague. The Service and those responsible for its efficient running are to be congratulated on what has already been accomplished, and we can look forward confidently to its even more successful functioning in the future.

The Fight Against Leprosy in China: It has been estimated that there are about 3,000,000 lepers in China, a figure which represents about one-third of the cases of leprosy throughout the world. To combat this terrible disease the Chinese Mission to Lepers is putting forth ever increasing efforts. The need of leprosaria at various strategic points has often been emphasized, and special efforts are being directed toward establishing these. Hankow has been found to be a serious focus of infection, nine-tenths of the lepers of Central China coming from within a radius of sixty miles of this city. It has also been found that most of the lepers in the Shanghai area come from districts north of the Yangtze Esturay. These facts have been elicited recently by the Reverend T. C. Wu, secretary-general of the Mission, while touring the Middle and Lower Yangtze Valley, principally in the provinces Hunan, Hupeh, Kiangsi and Kiangsu.

There is also a great deal of leprosy in the southern provinces, and endeavours have been and are being made to secure the cooperation of the local officials and gentry in combatting the disease.

At the Seventh Annual Meeting of the Mission to Lepers held in Shanghai on February 1, the reports showed excellent progress and gratifying public cooperation in the way of donations; but much more must be done and much larger sums contributed if the work of eliminating this disease from China is to be completed.

Medical Missions in China : Whatever may be the upshot of the probe into missionary enterprise in China that has been taking place, there can be no two opinions regarding the splendid work being done by medical missionaries throughout the country. In many instances the missionary doctor is the only Western style medical man and the missionary hospital the only institution of the kind in a whole district. They thus represent a most important economic factor in the life of the area they serve, not only doing much to alleviate the sufferings of the people, but acting as a most important object lesson to the authorities, who have in many cases been stimulated by their example to establish their own hospitals and health departments.

Tropical Medicine Congress at Nanking : It has been decided, says a recent report, that the Ninth Congress of the Far Eastern Association of Tropical Medicine is to be held next October in Nanking. Its objects is to promote friendly international intercourse amongst medical and scientific men ; to promote the science and art of tropical medicine in the Far East ; and to stimulate and guide public opinion regarding the prevention of diseases. After the congress has been held the delegates will have the chance of seeing something of the country as three tours are being arranged, one to Hankow, one to Peking and one to Hangchow.

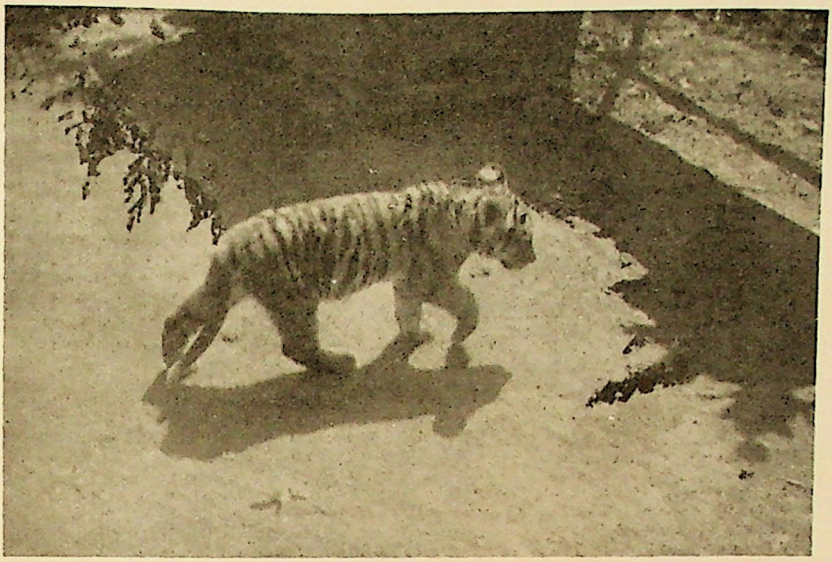
A. DE C. S.

SHOOTING AND FISHING NOTES

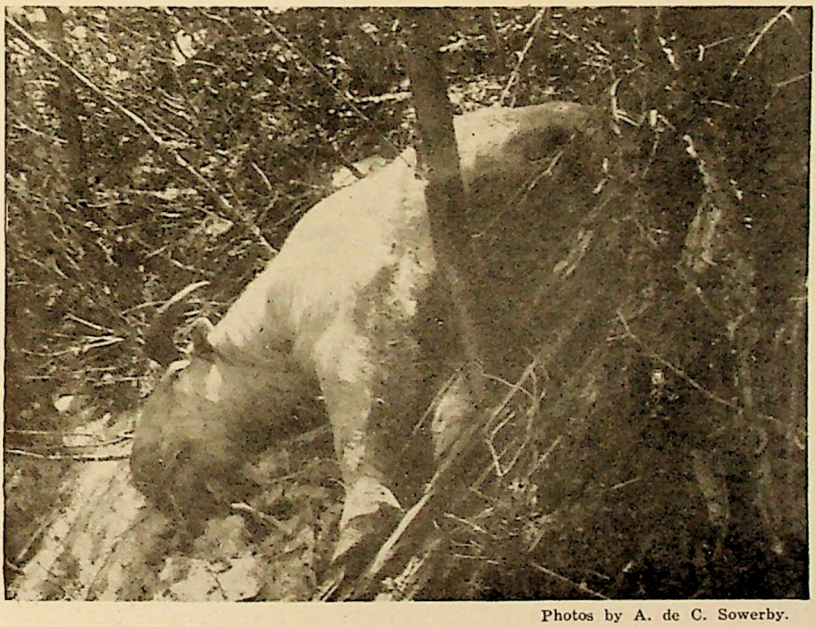
SHOOTING

China's Game Reserves : Although China is a thickly populated country, when compared with other great countries, such as North America, Africa, parts of India, Mongolia and Siberia, where game birds and animals are plentiful, she nevertheless harbours many kinds of game birds and animals, some of them in very considerable numbers. This is particularly true of the different varieties, ten in number, of common pheasant (*Phasianus colchicus sulesp.*), which abound throughout almost the whole country from north tos outh and east to west. Formerly, in the Lower Yangtze Valley area, before their wholesale exportation in cold storage in the years 1913 and following, these birds were extremely plentiful, finding ample shelter in the small copses, bamboo patches and brush covered areas of the many hills, in the great reed beds adjacent to the river itself, in the bamboo plantations round the farms, and in the grave patches scattered all over the fields. In all the more remote mountainous areas of the country they are still abundant, offering the most wonderful shooting to the sportsman. In such provinces as Shansi Shensi and Kansu, they are scarcely molested at all by the native hunters, whose chief quarry consists of deer, musk and fur-bearing animals.

Besides the various kinds of common pheasant there are numerous other species belonging to this great family to be found in China, namely the beautiful Reeves' pheasant (*Syrmaticus*), the even more handsome golden pheasant and its near relative Lady Amhersts' pheasant (*Chrysolophus*), the four subspecies of eared pheasant (*Crossoptilon*), the four types of the silver pheasant (*Gennaeus*) the five kinds of blood pheasants (*Ithaginis*) of the highest mountains of the west, the six subspecies of pucras pheasant (*Pucrasia* or *Ceriornis*), the two species of tragopan (*Tragopan*), the two monals (*Lophophorus*), Elliott's and Hume's pheasants (*Calophasis*), the fire-backed pheasant (*Polyplectron*) the peacock (*Pavo*) and the jungle fowl (*Gallus*), the last being the ancestor of our domestic chickens. Besides these there are in China various kinds of partridge, quail, francolin and grouse, all belonging to the family *Phasianidae*, which bring the total number of species and subspecies of this important group of indigenous game birds in the country up to sixty-eight, that is, if Manchuria



A young Manchurian Tiger *(Panthera tigris amurensis*, Dode.*)* taken in the Kirin Forest. This Species produces a thick almost Woolly Coat that fetches a high Price in the American Market.



Photos by A. de C. Sowerby.

A magnificent Golden Takin Bull *(Budorcas bedfordi*, Thomas*)* shot by Mr. A. de C. Sowerby in the Tai-pei Shan region of South-west Shensi. Note the strange shape of the Horns and the thick Legs and huge Hoofs.

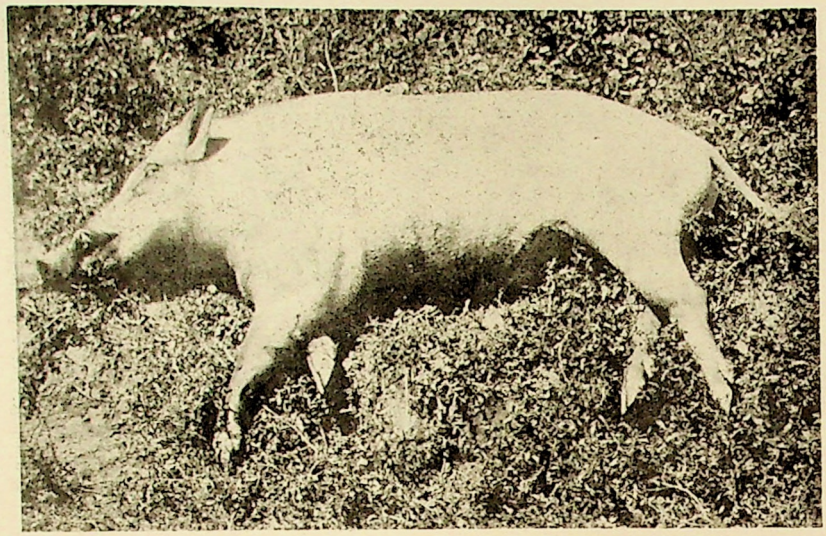
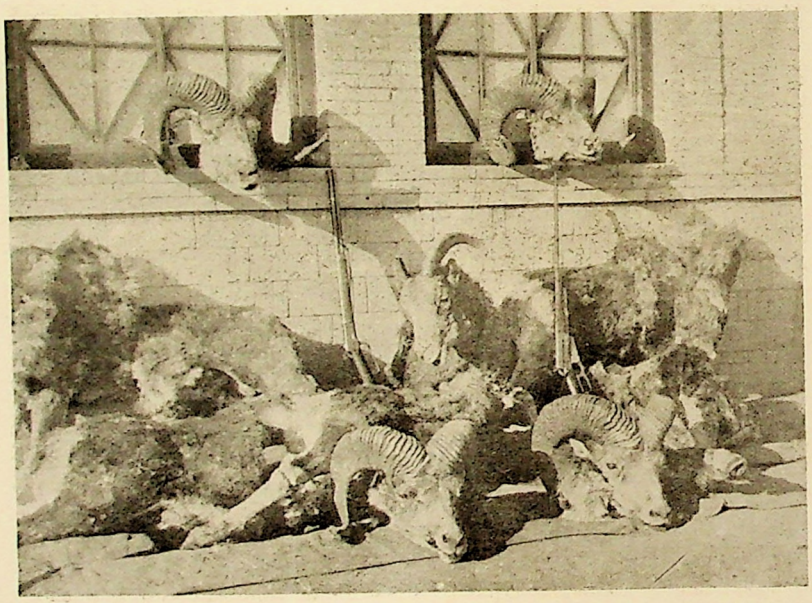
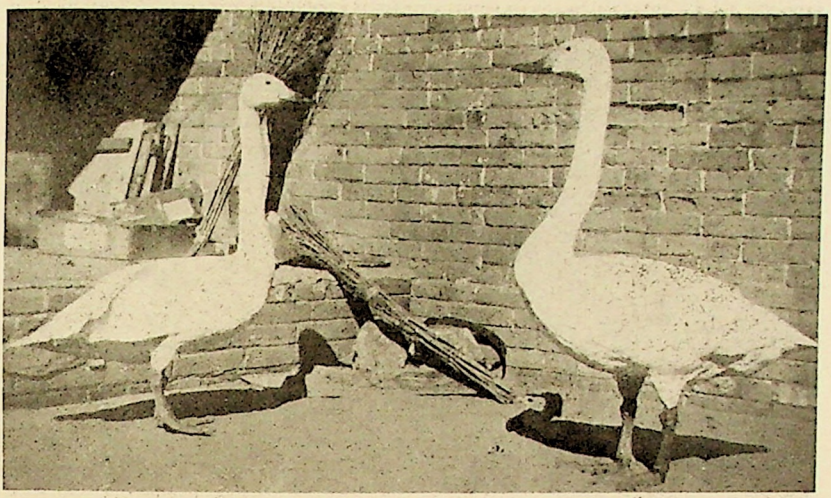


Photo by the Clark Expedition.

A magnificent Wild Boar in its short Summer Coat, shot by Mr. A. de C. Sowerby near Yen-an Fu in North Shensi. It weighed well over 300 lb.



Wild Sheep (*Ovis comosa* Hollister) shot in the Mountains near Kuei-hua Ch'eng in Sui-yuan on the Mongolian Border of North China.

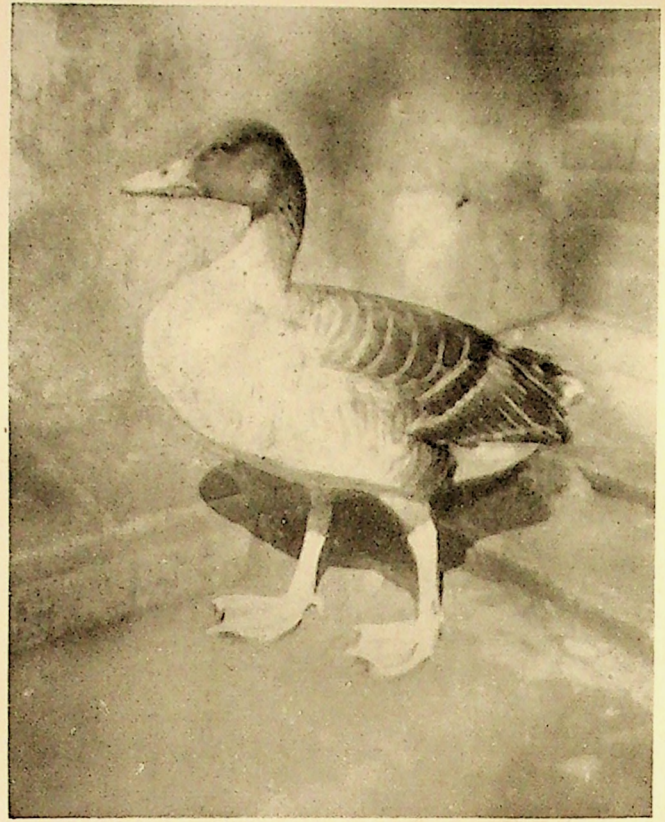


Specimens of Yankowski's Swan (*Cygnus bewickii jankowski*, Alpheraky) captured at Chin-wang Tao on the North-eastern Coast of China near the Manchurian Border



Photos by J.D.D. La Touche.

Two tame River Deer (*Hydropotes inermis* Swinhoe), a small Species without Horns but armed with long Tusks. It is abundant in the Lower Yangtze Valley, and its skins are exported in enormous Numbers from Shanghai.



The Bean Goose (*Anser fabalis*, Latham), the common Wild Goose of China. Millions of these Birds spend the Winter in Central and Southern China.



Photos by A. de C. Sowerby.

A Group of mounted Heads of Chinese Big Game Animals : Goitred Antelope, Big Horn Sheep, Roedeer, Wild Boars, Wolf and Fox.

and Hainan Island are included in the term China. Many of these birds occur only in the more remote and inaccessible regions, but nearly all of them are of definite economic value, either as food or for their magnificent plumage.

The next most important group of birds of the chase in China is that which includes the wild fowl, such as swans, wild geese, wild ducks and teal. There are four species of swan, some eleven or twelve kinds of wild goose, and thirty-four species of duck and teal that have been recorded in China. Most of these occur in great numbers during the migration seasons, immense flocks of them actually spending the winter months in the valleys of the great rivers, lakes and marshes of Middle and South China. Sometimes flights literally of millions of teal are seen during the migrations. They nearly all pass northward to breed in Mongolia, Manchuria and Siberia; but the yellow nib or Swinhoe's duck (*Anas zonorhyncha*) stops to breed in China from the Yangtze Valley northward, the garganey or summer teal (*Anas querquedula*) in the Yangtze Valley, northward, and even as far south as Fukien, the little cotton teal (*Nettopus corromandelianus*) as far north as the Yangtze Valley, and the tree duck (*Dendrocygna javanica*) in the southern provinces.

Of the other wild ducks and teal nearly all are almost identical with the common European or North American forms, the same being true also of the geese and swans. Besides those already mentioned are the mute swan (rare), the whistling swan, Bewick's swan, Jankowski's swan, the various forms of bean goose, the grey-lag goose, the two white fronted geese, the brant (rare), the bar-headed goose (only in the extreme west), the mallard, the gadwell, the pintail duck, the spectacled teal, the falcated teal, the common teal, the widgeon, the shoveller, the Mandarin teal, the red-crested duck, the pochard, the ferruginous duck or white-eye, Baer's duck, the tufted duck, the scaup, the golden-eye, the long-tailed duck (rare), the harlequin duck (rare), the ruddy sheldrake, the common sheldrake, the Indian comb duck (rare), the goosander, the common, the Himalayan and Gould's mergansers, the smew, the velvet and black scoters and Steller's eider. The last three, of course, are only found along the coast in winter, Steller's eider not south of the East Siberian coast, so that possibly it can not rightly be classed with the ducks of China.

The woodcock and at least seven kinds of true snipe may also be included in China's game birds, as they are very important both for sport and as food. Certain of the plovers and other wading birds, the various species of dove and wild pigeon, the pintailed sandgrouse, the great bustard and the little button quails complete a truly imposing list.

Of game animals China also boasts a considerable number, amongst them some unique and rare forms. Such are the takins (*Budorcas*), great ox-like goats that are found only in the highest mountains of the west, two species being known in the country. Related to these are the serows, also large goat-like animals, and the much smaller gorals, of both of which there are several subspecies. Four antelopes or gazelles are known from the north and west; while two wild sheep, the magnificent argali (*Ovis comosa*) and the blue sheep or burhel (*Pseudois szechuanensis*), are to be found along the Mongolian border in the extreme north, the latter also in the west. Several species of deer occur, ranging from the large wapiti and sika or spotted deer in the north and the sambur in the south-west down to the little musk deer of the mountains of the north, centre and west, the little hornless river deer of the Yangtze Valley and the muntjacs and tufted deer of the west, centre and south. The roedeer is prevalent all over the north, while Kopsch's deer, one of the sikas, still occurs in the wilder areas south of the Middle and Lower Yangtze. The hare and the wild pig are universally distributed, in some places being very abundant. The moose and reindeer occur in the extreme north and north-west of Manchuria, while the wild yak is to be found on the Tibetan border, where also and in Mongolia the wild ass occurs. In far off Chinese Turkestan wild camels and Przewalski's wild horse are said to occur.

All these fine game animals form a very big asset to China, and will become increasingly valuable as sportsmen from the West get to know about them and will be willing to pay for the privilege of hunting them.

But amongst the wild animals of China this country has another valuable asset, and that is the many fur-bearing species that occur. Although, on the whole, the individual skins are not very valuable, they make up for this in quantities, so that there is an important export trade in furs and skins. The list of China's fur-bearing animals is as follows: the tiger, the common leopard, the snow leopard, the clouded leopard, the lynx, several species of lesser cats and civets, the otter, the mink, the stone marten, the yellow-throated marten, the pine marten, the sable (only in Manchuria), the ermine, the polecat, the badger, the ferret-badger, the grizzly bear, the black bear, the giant panda, the little panda, the wolf, the wild dog, the fox, the raccoon dog, the mole, the flying squirrel, the fur squirrel, the chipmunk, the ground squirrel, the marmot or tarabagan, and the golden-haired monkey. This, too, is a formidable list, certainly as long as that of the fur-bearing animals of any other country in the world.

The Game Laws of China: Although up to the present various Game or Hunting Laws have been promulgated in China, none have so far proved satisfactory, and very little effort has been put forth to enforce them. The present Government is, however, engaged upon drawing up a new set of Game Laws, a translation of the incomplete draft of which was published in *The China Journal* in the "Shooting Notes" section in January of the present year. Since then other translations of more complete drafts have appeared, but, as work on certain phases of these new laws is still in progress, we do not propose to publish them again till they have finally been completed and promulgated. Various authorities are being consulted, and every effort is being made to make the laws and regulations governing the hunting of game birds and animals in China, whether for sport or for profit, as adequate and generally satisfactory as possible. We believe that this work is being conducted mainly by the officials of the Shanghai Bureau of Inspection and Testing of Commercial Commodities, under the Ministry of Industries.

As regards the translations of the new Game Laws which have appeared so far, it may be pointed out that some of the objections raised by foreign sportsmen are due to inaccuracies in these translations.

The matter of close and open seasons is receiving particular attention, and strong recommendations have been made to protect only indigenous game birds and animals with a close season, so that such birds as spring snipe, which only appear in China during the close season as laid down in the new laws, may be shot by sportsmen and native professionals. At present there is no need to protect the migratory game birds, by which we mean the wild fowl (swans, geese, ducks and teal), the woodcock and snipe, and the shore-birds (plovers, sandpipers and other waders).

One important point, however, appears to have been overlooked up to the present in the new Game Laws, and that is the question of exporting game in cold storage or preserved as canned goods. In view of what has taken place in the past and the way pheasants and other indigenous game birds have been almost exterminated in certain parts of China as the result of their wholesale exportation in cold storage, it is of the utmost importance that this kind of thing should be strictly prohibited.

As China comes to appreciate the value of her game reserves, and is able to turn them to the profit of the State, as is done in other countries by the issuing of shooting licenses, reaching many millions of dollars annually in some of the States of North America, she will find that, without some such provision against the commercial exploitation of her game birds and animals, she will have suffered an irreparable loss.

To sum up, what is really needed in the way of regulations governing the hunting of game birds and animals in China may be briefly stated as follows:

(1) Proper supervision of those engaged in such hunting, whether sportsmen or professional hunters, by means of a fair system of shooting and gun licenses.

(2) A close season to extend over the full breeding period for indigenous game birds and animals,

by which is meant wild edible birds and animals that breed in the country.

(3) The absolute prohibition of the exportation of the flesh of game birds or animals for commercial purposes.

All the other issues are of minor importance, and it is to be hoped that those engaged on the framing of the new laws will concentrate upon these three points.

A. DE C. S.

FISHING

Fishing as a Sport in China: While fishing as a profession has been developed to its utmost limit in China, as a sport it is still very much in its infancy. The Chinese, as a race, do not appear to have developed angling as a sport to any degree worth recording. Always the angler in China has been a professional, bent on making a few cents out of the hours he has spent on the banks of pond or stream watching his bobbing float. Doubtless he finds as much sport in his occupation as a Western sportsman would, but his ultimate aim is to have some fish to sell rather than a good story to tell.

Fishing for sport in this country has been confined almost exclusively to the Westerner, and, even so, has not gone very far.

A few years ago there were a number of ardent disciples of Isaac Walton in Shanghai who could spend a day sitting on the bank of some large pond trying to hook the wiley carp or the elusive ide, and there was even a small Angler's Club. This, however, has ceased to exist, and it is doubtful if there are now more than one or two fishermen of this type left here.

Meanwhile fishing for the Japanese sea bass (*Lateolabrax japonicus*), a truly sporting marine fish, has become a regular vogue in the summer resorts of North China, and every season we receive reports of good catches made with the casting rod, fine tackle and artificial spinning minnow bait. This is the only form of fishing for sport that has been developed to any degree in this country, but it is a genuine one, and affords really good sport to those who master the initial difficulty of learning where and how to cast.

The best months for this sport are May and September, with June, August and October offering their quota of fish. July and the first three weeks of August are too hot. What happens during the six months from and including November to April we cannot say, except that no one seems to have caught any of these delectable and very sporting fish during these months.

Bottom fishing for flounders, rock bass and other less sporting marine species may be had at various spots along the northern coasts, while Spanish mackerel, yellow-tails, sharks and other open sea species have been taken from time to time by Western sportsmen.

There is no reason, however, that we can discover why the Chinese coastal waters should not yield as good fishing for sport as any other in the world; and we firmly believe that it is only a matter of time for this type of sport to be developed. A visit to the fish markets, such as those in Shanghai, Tientsin, Ningpo or Foochow will convince anyone really interested that the China seas have as good sporting fish as any.

As regards fresh-water angling, besides the common carp and ide already mentioned, there are a number of fish which can be considered truly sporting, although they do not go into the category of "game" fish as that term is understood in England and America. China has none of the salmonoids, except for a single species of trout said to occur in the streams of the old Imperial Hunting Grounds in what is now known as Jehol Province. But there are some good substitutes, chief amongst which is a large member of the carp family, called the *kan-yü* or *huang-chuan* (*Elopichthys bambusa*), which is extraordinarily like a salmon in external appearance, and can only be hooked on an artificial spinning minnow bait or a live bait on an Archer spinner. It is said not to put up as good a fight as the salmon, however. The notch-jaws (*Opsariichthys uncirostris* and *O. bidens*) and the rainbow carp (*Zacco platypus*), all of which are beautifully coloured with rainbow hues in the breeding season, readily take a fly and fight like a stout brook trout. They are found only in clear swift streams and rivers, especially in riffles where shallow water runs over

sloping bottoms strewn with large stones or small boulders.

In clear creeks and canals certain other species of carp known as culters will also take a fly, and, attaining a large size, offer good sport. The Mandarin fish (*Siniperca chuatza*), which is a species of fresh-water bass, is a poor creature, though highly prized as a table delicacy, but, its cousin, *Siniperca scherzeri*, is a really sporting fish, well worth the attention of the Western angler in China.

Catfish in China as elsewhere are an abomination and a nuisance, a qualification which they share with the river turtle. In Chinese creeks and canals there is a monster fresh-water prawn that causes many a fisherman no little perturbation as it toys with his bait.

A. DE C. S.

THE KENNEL

The Economic Position of the Dog in China : There are several distinct breeds of dog that may be recognized in China. Some of these, such as the "Chow" and the "Peke," have been taken up by Westerners and have become of greater importance in Europe and America than they are in their own country; so much so, indeed, that really good specimens of the breeds are now only to be secured abroad. As far as China is concerned these dogs are of little or no economic importance. The common dog of the country, usually given the name of "wonk" by Westerners, is, however an animal of very considerable economic importance. Used mainly as a watch-dog in cities and towns, its importance in this direction alone is considerable. In country places it is also used for other purposes, such as guarding flocks of sheep and goats in the open from the attacks of wolves and for hunting. In Manchuria it is bred on big farms for the sake of its coat, large quantities of dog skins being exported from the ports of North China and South Manchuria to Europe and America, where they are utilized in various ways. In Canton and the south generally the dog is regularly eaten, being esteemed a delicacy, and smoked dog hams are exported to other parts of the country. These may be seen any day in certain shops in Shanghai. A large fierce type of dog, usually known as the Tibetan mastiff, is used as a watchdog in inns in the wild country along the Tibetan and Mongolian borders, and also to accompany the camel caravans. So powerful and savage are these dogs that they form a very effective guard for the camps, and two or three of them turned loose will keep all strangers away without very much difficulty. Even armed robbers will think twice before attacking a camp so guarded.

Except for the small breeds such as the Peke and related varieties, the dog in China is essentially an economic animal, and is given a home purely on account of its usefulness to man.

The China Kennel Club : Affiliated with the English Kennel Club is the China Kennel Club, with its headquarter in Shanghai at the office of the Honorary Secretary, Mr. J. L. Hunter, No. 6 Kiukiang Road. This institution holds a Dog Show every year in the late spring or early summer, and its object amongst other things is to encourage the keeping and breeding of good dogs of all classes in this country. When first formed some ten years ago by a few enthusiasts the main interest was sporting dogs, but it was soon found that this had to be extended to include all breeds. Every year since the spring of 1923, when the first show was held, very successful shows have been arranged, and it has been noticeable how the various classes have improved, thus gratifyingly justifying the efforts of those responsible for their promotion.

The Show this year is to be held at the Race Course on May 21, and we understand that there has been a satisfactory number of entries up to date.

The Shanghai Society for the Prevention of Cruelty to Animals : The local branch of the S.P.C.A. is to be congratulated on the interest aroused

by the competitions it has inaugurated in the schools of Shanghai with a view to inculcating in the children the correct attitude towards dumb animals. Ten Chinese schools responded recently to a competition for prizes for essays on the subject of prevention of cruelty to animals, and over 1,400 essays were sent in, mostly in the Chinese language. Previously a similar competition opened to the students in foreign schools had met with considerable success. In a country where the prevention or abstention of cruelty to animals is an entirely new idea, and where as yet no laws to this effect exist, the method of educating the rising generation in the principles the Society stands for is the only one that can in the long run prove really effective.

Foreign Dogs in China : For the sake of those in countries outside China interested in dog breeding it may be stated that most foreign breeds do very well in this country, especially from Shanghai northward. It is, perhaps, a bit too hot in the south for dogs born and brought up in a cool country such as Great Britain, but with care they can be made to thrive, though thick-coated dogs require clipping in the summer. There has always been a steady influx of foreign dogs into China, where the stocks seem to deteriorate after a few generations. This is probably due rather to inbreeding than to climatic conditions, and will continue till such time as there are sufficient stocks in the country to ensure the possibility of introducing new blood from time to time into any given kennel.

At present Alsatians, Airdales, and wire-haired fox-terriers seem to be the most popular breeds in Shanghai, the first of these far exceeding any other. Sporting dogs have fallen off in number and quality in recent years, due, apparently, to the fact that the shooting available from Shanghai has not been as good or as easily secured as it used to be. Small dogs of all breeds suited to being kept in apartments have become increasingly popular.

The rich Chinese of Shanghai have gone in extensively for Alsatians, principally as watchdogs, as a result of the prevalence of late years of kidnapping and armed robberies.

THE GARDEN

CHINA'S HORTICULTURAL CONTRIBUTIONS TO THE WEST

More than once we have referred in these columns to the wonderful contributions China has made to the gardens of Europe and America. In the very first number of this journal, issued in January, 1923, we published the first instalment of a fascinating article by the well-known writer on China, Mrs. Florence Ayscough, entitled "The Chinese Idea of a Garden." This article ran through four numbers of the journal, and from it may be gathered how much the English school of gardening was influenced by Chinese ideals in this direction. In fact, it is generally conceded that the informal style adopted by the English gardeners and landscape architects, when they broke away from the formal Italian school, was almost entirely derived from the Chinese, amongst whom natural features in the way of hills, rocks, pools and plants, in addition to the quaint buildings of man, are a *sine qua non* in a garden, all carefully arranged to resemble as nearly as possible the beautiful scenery of the wilds. Incidentally, it may be mentioned that in the hilly and mountainous areas on the Yangtze Valley provinces, and more especially of the provinces of Chekiang and Fukien, the former of which is famous for the number of scholars, poets and artists it has produced, the Chinese have wonderful scenery in the way of rugged peaks and pinnacles, fantastic rock formations, waterfalls, mountain torrents, winding stone-paved paths, old creeper-clad bridges, monasteries half hidden by the foliage of rare trees, pine woods and even forests upon which to model their gardens. And it is the beauty of these areas that has influenced both the

landscape painting and the landscape architecture of these people. This influence has been passed on to Europe and America through the English school, and is, perhaps, the foremost of the many horticultural contributions that China has made to the West.

The other side of the picture is well brought out in the late E. H. Wilson's beautiful book "China, Mother of Gardens," which was a revised edition of his earlier work "A Naturalist in Western China." In these the able author, who spent many years exploring the botanical resources of West China and the Yangtze Valley, shows very clearly how much Europe and America owes this country in the way of beautiful garden plants. The number of the latter is so great that it is impossible to give even an outline of them here. Suffice it to say that most of our azaleas, rhododendrons and primulas had their origin in West China; while the number of garden plants with the specific name *japonica* indicates how many other kinds we owe to China, for in almost every case these plants originated in China, the Japanese having borrowed them from this country.

How many garden flowering plants, one may ask, did Robert Fortune, who made extended journeys through the tea producing areas of this country on behalf of the Royal Horticultural Society and the East India Company in the years 1842 to 1862, introduce to the West? And before his time how many did the various Embassies that came to China from the West take back to Europe with them. And even before that how many reached Europe from this country in the early days of civilization?

In more recent times the explorations in Western China of Purdom, Farrer and Kingdon Ward have added plant after plant of rare beauty to our gardens; and still there are more to come; still the tale is not told of the wonderful horticultural possibilities of this great and mysterious country. Verily is China the "Mother of Gardens."

THE MARKET GARDEN IN CHINA

With a people living as close to the soil as the Chinese, the market garden, by which is meant the gardens and small farms which supply the populace with their green vegetables, fruit, garden plants, poultry and eggs, is of the utmost importance. Especially is this the case in the vicinity of large cities, usually surrounding which for considerable distances along the main thoroughfares may be seen such gardens or farms full at almost all times of the year of market produce. It must be remembered that, except recently, and then only in certain areas adjacent to railways and modern harbours or ports, the Chinese have never had the means of transporting perishable garden produce over long distances, so that each village, town and city perforce has had to be supplied from the country immediately surrounding it. This has given full reins to the Chinese gardener's genius, the result of which is that everywhere, even in the most inhospitable and arid regions, the communities enjoy a goodly supply of fresh vegetable. We well remember arriving early one summer at the city of Yü-lin Fu on the Ordos border of North Shensi, after weeks of travel and sojourn in the arid wastes along the Great Wall in this region, fully expecting to have to continue our diet of mutton, bread and millet, unrelieved by any vegetable except the crude salted cabbage of the natives. To our surprise and delight we found the local market full of fresh vegetables, including the most delicious radishes and such like. An investigation showed that the farmers had taken advantage of the low-lying muddy flats adjacent to the river, itself a turbulent silt-laden torrent, to develope delightful market gardens, using reed screens to shelter the young plants from the bitter sand-laden north-westerly winds that never seemed to die down, and irrigating the numerous garden plots by means of a series of small canals which carried the clear water of a spring in the adjacent sandstone strata over the parched and thirsty land. They had even succeeded in growing fruit trees in this terrible desert area.

And so it is all over China, though, of course, the humid and semi-tropical south has greater advantages in this direction than the cold and aird north.

Meanwhile in Foochow and other southern ports, as well as in Hongkong, garden vegetables, including such kinds

introduced from the West as cauliflower, green peas and the like, are grown in great quantitites for the Shanghai market and other more northerly ports, which thus enjoy fresh vegetables the year round, the southerly areas producing these during the winter months and the northerly areas producing them during the summer months.

Altogether the market gardening industry of China is immense, employing large numbers of her agrarian inhabitants, and running to tens if not hundreds of millions of dollars annually in value.

A. DE C. S.

SOCIETIES AND INSTITUTIONS

Scientific and Other Cultural Societies in China : Although for long the only society of a scientific or cultural nature in China was the North-China Branch of the Royal Asiatic Society, founded in 1857, with its headquarters consisting of a two storey building on Museum Road in Shanghai, and housing a Natural History Museum and a Reference Library, subsequent to the Boxer troubles in 1900 there came an awakening amongst the Chinese and an interest in Western science that has resulted in the past two decades in the founding of a considerable number of scientific societies and institutions. Previous to 1900 the Siccawei (Zikawei) Museum and Observatory had been founded by the Jesuit Mission in Shanghai, but this is not a public institution, although it has always done splendid scientific work in China.

The Science Society of China was founded in 1914, commencing its publication, *Science*, the following year.

In 1916 the Government Geological Survey of China was established. The Geological Society of China was founded, in 1922, both organizations issuing extremely valuable publications. In 1923 the China Society of Science and Arts was founded, with *The China Journal of Science and Arts* (now *The China Journal*) as its official organ. This Society and Journal greatly helped to stimulate interest in the sciences in China, especially in zoology and botany, and soon other institutions for the study and advancement of biology in its various branches were started. Amongst these were the Peking Society of Natural History, with its *Bulletin* ; the Fan Memorial Institute of Biology, with its *Bulletin* (also in Peking) ; the Academia Sinica in Nanking, with its many affiliated institutions and publications, including the Metropolitan Museum of Natural History ; the Institute of Oceanography, with its Aquarium at Tsingtao ; the Marine Biological Association of China, with its Summer Institute of Biological Research and *Annual Report* ; and the West China Border Research Society in Chengtu, Szechuan, with its annual *Journal*. Besides these many of the universities have their biological departments and issue publications. Amongst them may be mentioned those of the Sun Yat-sen University in Canton ; Yenching University in Peking ; Fukien Christian University in Foochow ; St. John's University in Shanghai ; Shansi University in Tai-yuan Fu ; and Lingnan University in Canton. Chengtu University in Chengtu, Szechuan, has a museum that is destined to be of considerable importance.

Dr. E. Licent, S.J., has founded a very fine museum in Tientsin, called the Hoangho-Peiho Museum of Natural History, which he has filled with the results of his extensive collecting trips throughout North China and Mongolia ; while Professor E. T. Nystrom, formerly of Shansi University, has founded an enterprising research institute that bears his name. This is located in Tai-yuan Fu, Shansi.

A very good quarterly journal, called *The Hong Kong Naturalist*, has recently been started in Hongkong.

An institution of a somewhat different character is the Chinese Social and Political Science Association in Peking, with its *Review*.

The Shanghai Science Institute, founded some eight years ago with funds from the Japanese returned Boxer Indemnity, has recently opened a splendid new building in Shanghai, with the object of carrying out joint Chinese and Japanese scientific research.

Recently, too, the Royal Asiatic Society has completed a fine new building, where what is hoped to be one of the best Museums in China is being developed.

EDUCATIONAL NOTES AND INTELLIGENCE

Chiao Tung University: Of the many universities that have been established in China, the Chiao Tung is the most important from the purely economic point of view, since it provides instruction on all the various branches of engineering, railway administration, mining and the like. It is one of the oldest modern educational institutions in China, having been started thirty-seven years ago under the sponsorship of Mr. Shen Hsuan Wei, then managing director of the China Merchants Steam Navigation Company and the Imperial Telegraph Administration.

It is composed of the following five colleges:

The Nanyang College of Science, Shanghai.
The Nanyang College of Administration, Shanghai.
The Nanyang College of Engineering, Shanghai.
The Peiping College, Peiping, devoted to Railway Administration.
The Tangshan College, Tangshan, Hopei, devoted to Mining and Civil Engineering.

It has been reported recently that the Tangshan College is going to be moved to Nanking, probably as a result of the proximity of Tangshan, where the Kaiping coal mines are, to the scene of warfare in the north.

The present enrollment of the Chiao Tung University is eleven hundred students. Dr. J. Usang Ly is the president of this important institution.

Recently the University held an Engineering and Railway Exhibition on its campus in Shanghai, which proved a great success, a large number of Chinese and foreign engineering firms and merchants contributing to its support by sending exhibits and in other ways.

On April 8 the University celebrated its thirty-seventh anniversary with a dinner attended by over a hundred representatives of Chinese and foreign commercial organizations, which also was a great success.

Shanghai University Business School: Considerable success has attended the Down Town Business School of the University of Shanghai, which has been running for some time now. This institution provides young Chinese with a good education in all branches of modern business and commerce, and is a distinct benefit to the community it serves.

There are other business schools in Shanghai run by commercial interests.

PUBLICATIONS RECEIVED

Books:

National Research Council of Japan Report No. 10

The Story of Kalaka, by W. Norman Brown: Freer Gallery of Art, Smithsonian Institution, Washington, U.S.A.

Toward Planetism, by Roger R. Hawkins; Sun Yu Press, Peking.

Problems of Population, edited by G. H. L. F. Pitt-Rivers: George Allen J. Unwin Ltd. London.

Report of the National Quarantine Service, Series III, 1932, by Dr. Wu Lien-teh and Dr. Wu Chang-yao: 2 Peking Road, Shanghai.

Periodicals:

Manchuria Monitor — Geographical Review—The Lloyd Mail—Philippine Magazine—Palaeontologia Sinica—The Shipping Review—Chinese Economic Bulletin—Biological Supply Service—The New Zealand Journal of Science and Technology—Chinese Economic Journal — Smithsonian Miscellaneous Collections—La Revue Nationale Chinoise—Bulletin of the Fan Memorial Institute of Biology—Natural History—Science—The Metropolitan - Vickers Gazette—The Chinese Recorder—Special Report of The Geological Survey of China—The Travel Bulletin—Discovery—The Philippine Journal of Science—Man—Game and Gun—The Y Spokesman—World Unity—The American Co-Mason—The Journal of the Society of Chemical Industry, Japan—British Motor Boating Bulletin—The Salmon and Trout Magazine—The Leper Quarterly.

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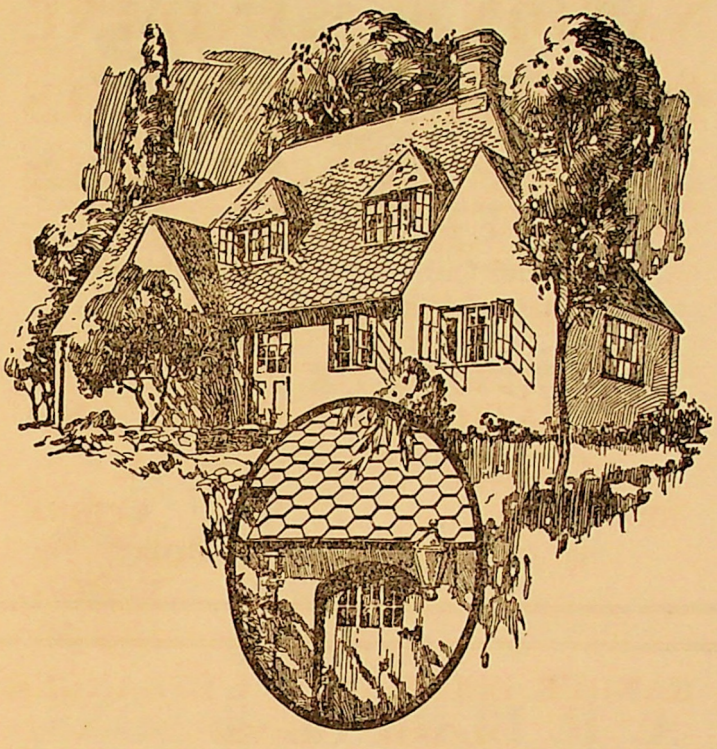
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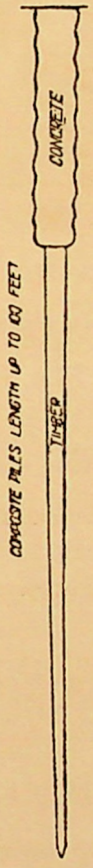
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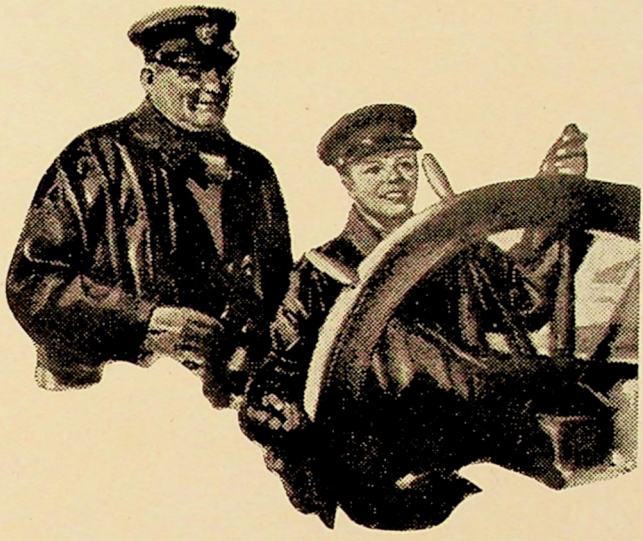
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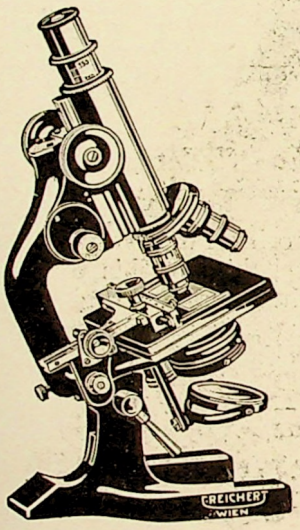
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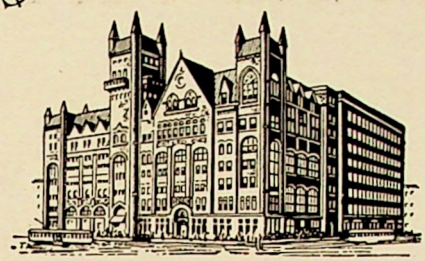
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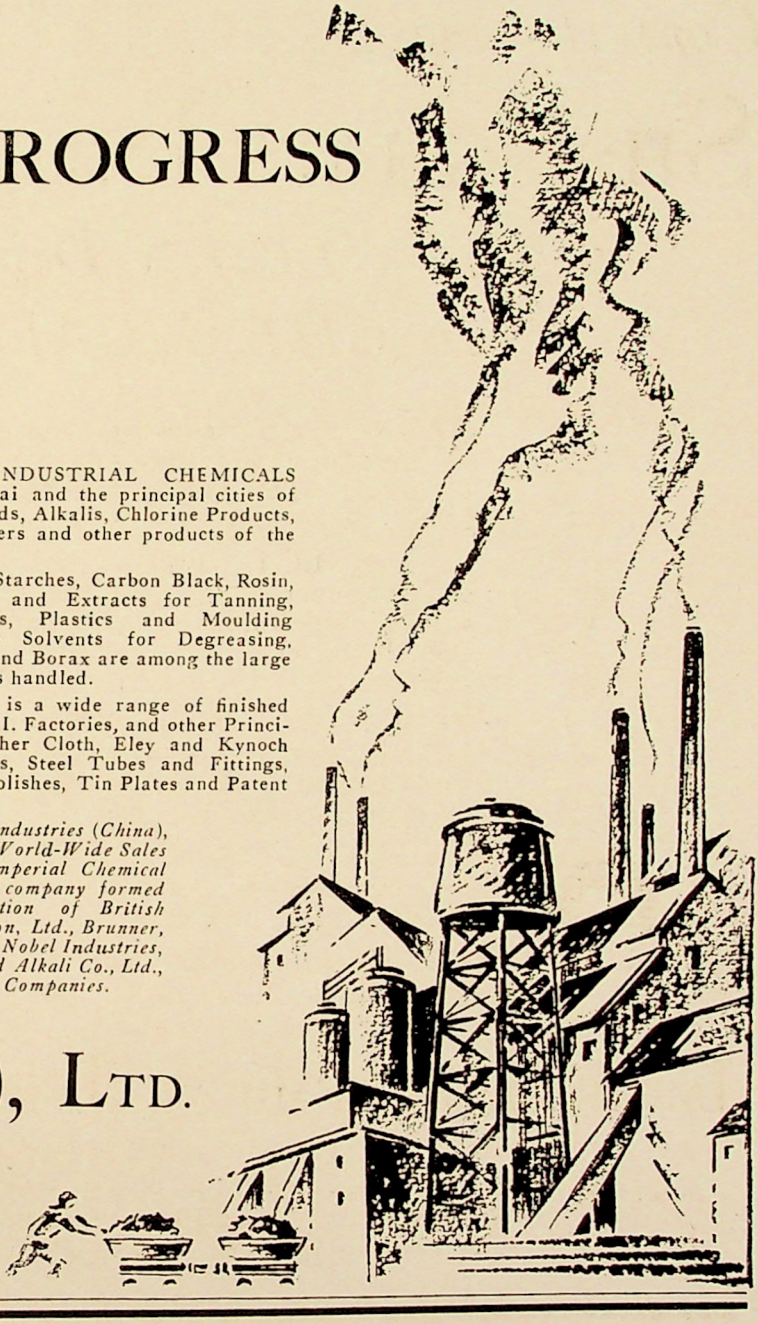
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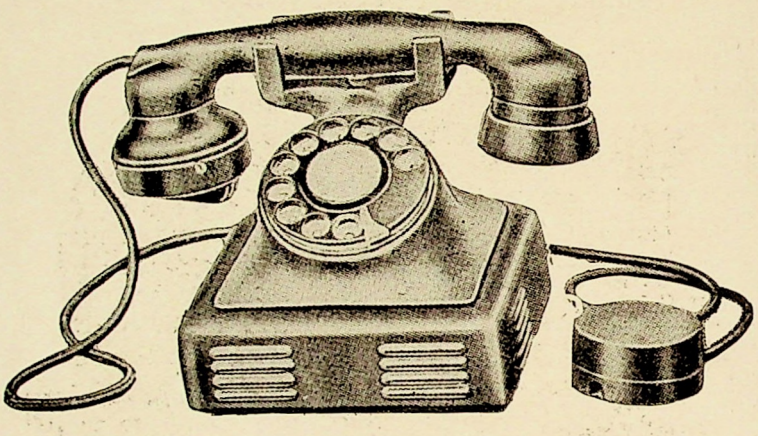
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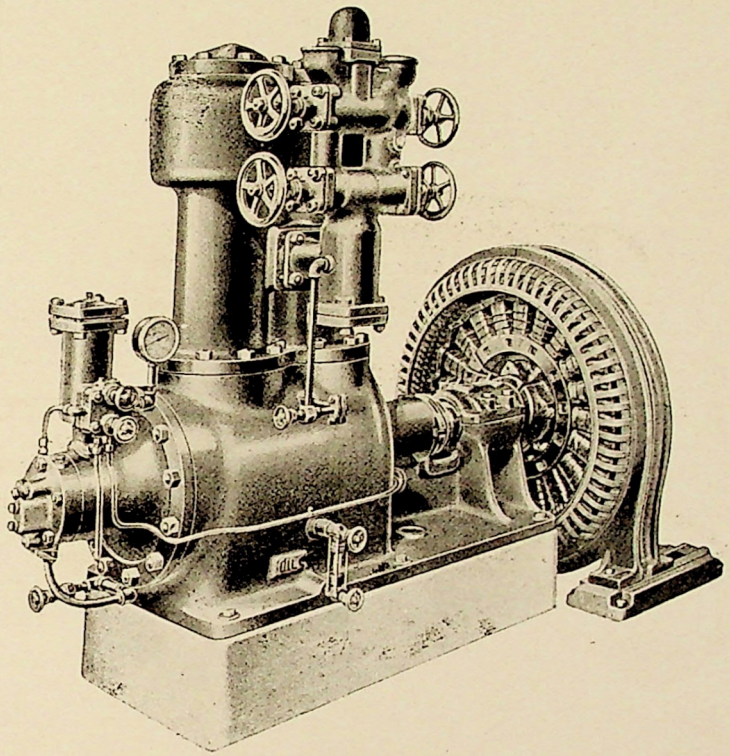


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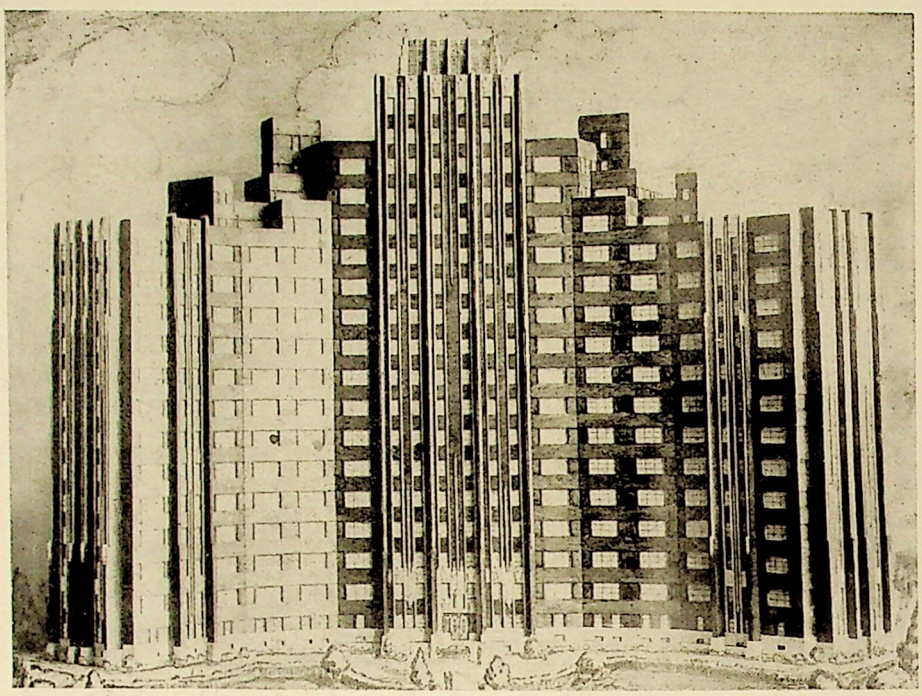
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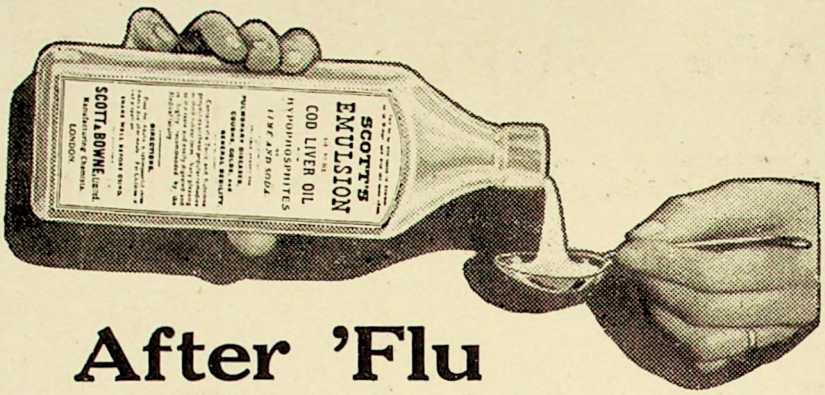
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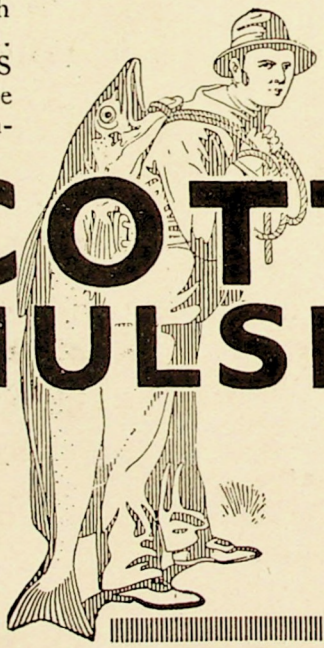
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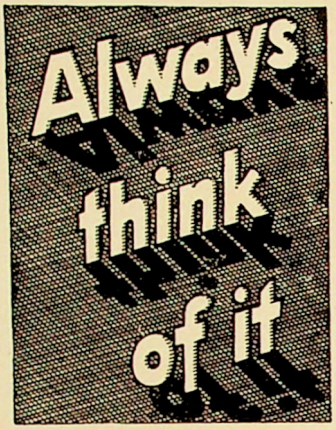


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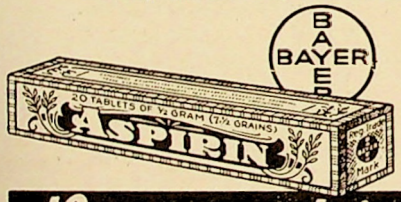


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